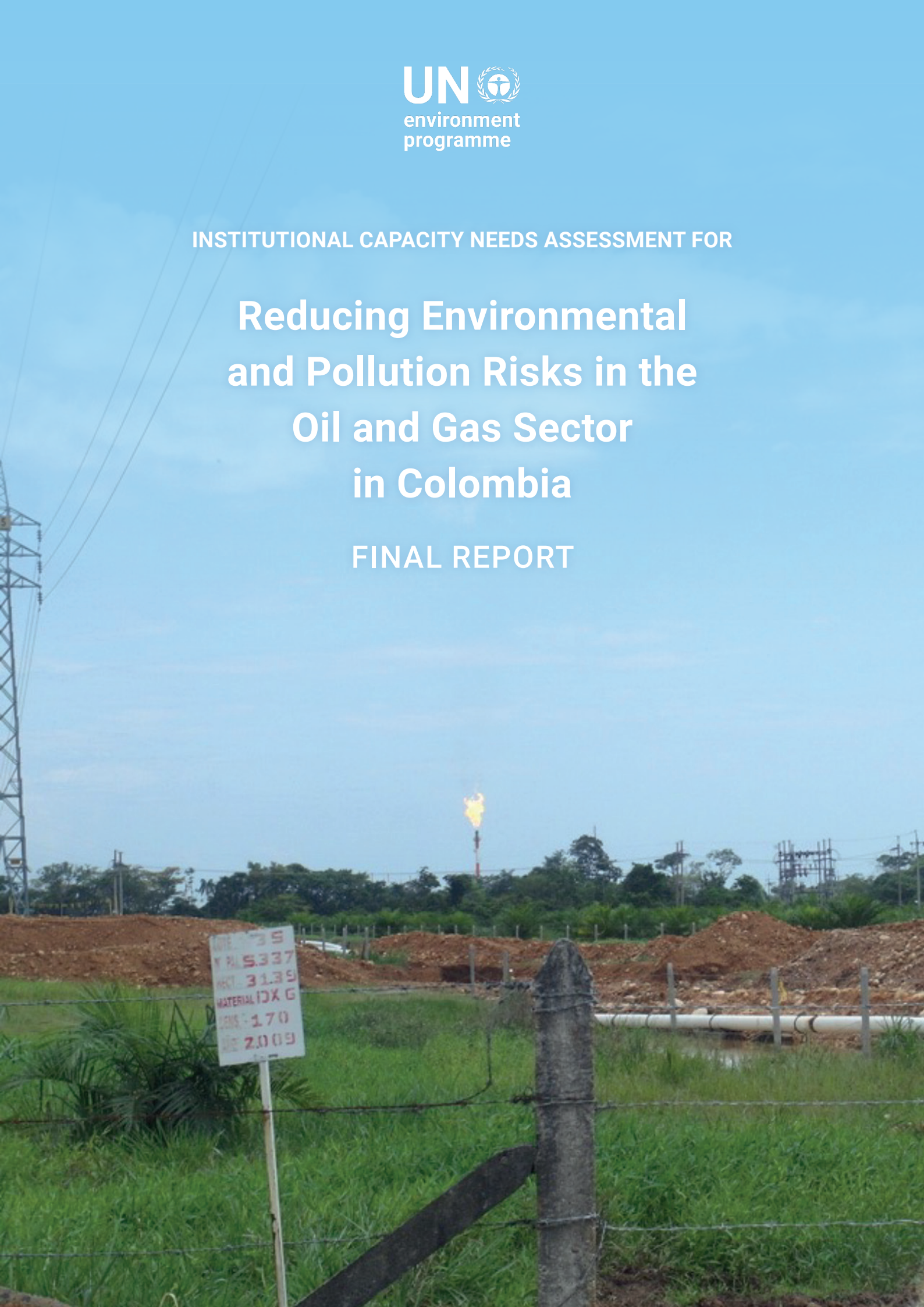
UN environment programme

INSTITUTIONAL CAPACITY NEEDS ASSESSMENT FOR

Reducing Environmental and Pollution Risks in the Oil and Gas Sector in Colombia

FINAL REPORT



First published in 2022 by the United Nations Environment Programme

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United Nations Environment Programme (2022). Institutional Capacity Needs Assessment for Reducing Environmental and Pollution Risks in the Oil and Gas Sector in Colombia.

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Design and layout: Lynda Monk/Red Kite Creative Ltd

Institutional Capacity Needs Assessment for Reducing Environmental and Pollution Risks in the Oil and Gas Sector in Colombia

FINAL REPORT

December 2022

Cover photo: Gas flaring at Acacias municipality in the Colombian Llanos

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CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS

ACRONYM	Name of entity [English translation] (parent Ministry where applicable)
ACGGP	Colombian Association of Oil Geologists and Geophysicists
ACP	Colombian Oil Association
ANLA	National Environmental Licensing Authority
ANH	National Hydrocarbons Agency
CAM	Upper Magdalena Autonomous Regional Corporation
CARSUCRE	Sucre Regional Autonomous Corporation
CAS	Santander Regional Autonomous Corporation
CCAC	Climate and Clean Air Coalition
CNA	Capacity Needs Assessment
CND	Contribución Nacionalmente Determinada
CORDATEC	Corporación Defensora del Agua, Territorio y Ecosistemas
CORPOAMAZONIA	Corporación por el Desarrollo Sostenible del Sur de la Amazonía (Corporation for the Sustainable Development of Southern Amazonia)
CORPOBOYACA	Boyacá Regional Autonomous Corporation
CORPONARIÑO	Nariño Regional Autonomous Corporation
CORPONOR	Regional Autonomous Corporation of the North-eastern Border
CSA	Contaminated Sites Assessment
CSO	Civil society organisation
DAASU	Dirección de Asuntos Ambientales Sectorial y Urbana
DIMAR	Direccion Nacional Maritima
DNP	Departamento Nacional de Planificación
DRM	Disaster Risk Management
ECP	Ecopetrol
EIA	Environmental Impact Assessment
EITI	Extractive Industries Transparency Initiative
ELN	Ejército de Liberación Nacional
FARC	Fuerzas Armadas Revolucionarias de Colombia-Ejército Popular

ACRONYM	Name of entity [English translation] (parent Ministry where applicable)
GEF	Global Environment Facility
GHG	Greenhouse Gas
GIS	Geographic Information System
ICP	Instituto Colombiano del Petróleo
IDEAM	Instituto de Hidrología, Meteorología y Estudios Ambientales
IMEO	International Methane Emissions Observatory
INVEMAR	Instituto de Investigaciones Marinas y Costeras
MADS	Ministerio del Medio Ambiente
MINAMBIENTE	Ministerio de Ambiente y Desarrollo Sostenible
MINENERGIA	Ministerio de Energía
NCEA	Netherlands Commission for Environmental Assessment
NDC	Nationally Determined Contribution
NGO	Non-governmental Organisation
ODS	Ozone-depleting substances
OEM	Ordenación del espacio marítimo
OFD	Oil for Development
OGMP	Oil and Gas Methane Partnership
ONAC	Organismo Nacional de Acreditación de Colombia
ONU	Organización de las Naciones Unidas
PCF	Prototype Carbon Fund
PNUMA	Programa de Naciones Unidas para el Medio Ambiente
SEA	Strategic Environmental Assessment
SNIGRD	Sistema Nacional de Información para la Gestión del Riesgo de Desastres
TWG	Technical Working Group
UNEP	United Nations Environment Programme
UNGRD	Unidad Nacional para la Gestion del Riesgo de Desastres
UNO	United Nations Organisation
UT IJT	Union Temporal Ismocol Joshi Parko

ACKNOWLEDGEMENTS

UN Environment Program (UNEP) would like to thank for their assistance, the focal point of Oil for Development Program, from the Ministry of Environment, Ms Magdalit Holguin Santa, and the UNEP Colombia Office (Mauricio Bedoya) for the completion of the Capacity Needs Assessment (CNA) questionnaire and organizing the group reviews; also for organizing the introductory meetings and providing guidance during the Contaminated Site Assessment (CSA) course preparatory visit to Bogota in 2019, and to the Ecopetrol team for their presentation, sharing remediation experiences and offer to host our training workshop, which was eventually held online in November 2020. We are very grateful to all those who freely took the time to meet and discuss this training workshop. We also appreciate those who took the time to complete the CNA Questionnaire, and those who took part in the bilateral sector-specific meetings; we thank you for your dedication, suggestions, and insights.

We would like to specially thank the government workers who participated in the final revisions and in the exchange of information, documents and ideas during the final update process in November 2022.

We thank you all for your time and commitment. Assisting UNEP in delivering these activities were Cristian Rojas Cifuentes and Juliana Ibarra Yomayusa from the UNEP Colombia office. For the organizational support and technical contribution to this report, we also thank Devashree Pillai from the UNEP Disasters and Conflicts Branch, Geneva office. Likewise, we thank the Paris UNEP climate and energy branch for their contribution in the review process of this report, with special thanks to Meghan Demeter.

EXECUTIVE SUMMARY

Onshore gas reserves in the central valley of Colombia have been utilized for over 100 years, and by mid-1980, Colombia became an oil exporter as production volumes increased significantly. In 2015, oil accounted for 20% of the country's revenue. Despite the sustained income from oil exports, Colombia has a long history of socio-environmental conflicts, due to the frequent overlapping of hydrocarbon exploration and production areas, biodiversity hotspots, protected areas and indigenous territories. With many of the oil blocks located in Western Amazon, environmental concerns are a cross-cutting issue. Despite being Latin America's fourth leading oil producer, significant new discoveries are now rare in the country. It is widely recognized that Colombia's hydrocarbon future will come from three sources: unconventional (specially fracking), offshore (Caribbean Sea) and enhanced oil recovery. All these potential sources have associated environmental concerns, some of which are being addressed by the current Colombian Government. According to the latest policies from the new government, it has been decided not to continue with these projects. However, this scenario is subject to future change, with fracking being at least a possibility in the future.

Several international development partners, including the Government of Norway's Oil for Development Program (OfD), have come forward to support the Government of Colombia in managing its emerging oil and gas sector. On behalf of the Government of Colombia, UN Environment Program (UNEP) carried out a rapid institutional Capacity Needs Assessment (CNA) on Strengthening Environmental Management in the Oil and Gas Sector, which was initiated in November 2019 and continued through online consultations in June 2020, resulting in a Preliminary draft CNA Report in January 2021 and concluding with this report in September 2022. The CNA aims to contribute towards the country's long-term capacity development on environmental management in the petroleum sector.

Objectives and scope

The objective of the CNA is to document the capacity needs of key Government Ministries, Departments and Agencies (MDAs) with respect to environmental management in the oil and gas sector. The CNA contributes towards a national "roadmap" that outlines the strategic capacity needs of Government institutions to strengthen environmental management in the oil and gas sector.

In November 2019, UNEP initiated the CNA process in Bogota. A three-phased approach was adopted following adaptation required, imposed by the COVID-19 pandemic restrictions, that included: (i) desk review of available documentation; (ii) an initial, in-house draft completion of the CNA Questionnaire, that was then shared with a small group of key informants in Colombia, before a wider group of multiple stakeholders were convened through a virtual workshop to review the questionnaire and related CNA issues; and (iii) Part 1 of the national training on contaminated site assessment (CSA) which provided opportunities to further discuss with invited participants (from Government, academia and Ecopetrol) the concerns raised through the previous two exercises.

This CNA looks at cross-cutting challenges and opportunities and the overall capacities of Government institutions to deal with the emerging challenges of upstream oil and gas activities over the long-term. It examines the roles various Government institutions play in environmental management in the oil and gas sector and the challenges experienced by the individual institutions. It identifies several key concerns which need to be validated before recommendations can be drafted to address them. The planned validation process was halted due to the COVID-19 restrictions, but alternative approaches adopted during 2021 and 2022 succeeded in constructively engaging with key institutions for comments and inputs to this final report.

The eight main categories assessed within the scope of environmental management included: (1) national institutions/institutional capacity related to the environment and the oil industry; (2) policies and legal framework and governance, (3) national technical capacities related to environmental management of the oil and gas sector; (4) NGO and civil society/citizen participation; (4.1) local communities; (5) academia engagement; (6) print and media; (7) private sector presence and engagement; and (8) emergency preparedness and response. To these can be added the other categories that have been identified through the wider literature review and from discussions held with key stakeholders, and from feedback received during the online CSA training course, namely contaminated sites and remediation, emissions and flaring, accredited laboratories, fracking, offshore exploration, and environmental data relevant to the oil and gas sector. Each of these are described in more detail below, corresponding to the main thematic sections in the report, and summarized in Table A1 and detailed further in Annex 4 on the Key Findings and Results of the Preliminary CNA Report.

National institutions/capacity related to the environment and the oil industry

Section 1.1 of Annex 4 describes the comprehensive institution infrastructure in existence for the management of the oil and gas sector, where environmental issues are mainly addressed by the Ministry of Environment and Sustainable Development (Minambiente).
At Minambiente, the National Authority for Environmental Licensing (ANLA) is the entity in charge of assessing, securing and environmental supervising of oil and gas projects in the country. The three main concerns identified relate to the financial capacity to provide and maintain equipment for field sampling and analysis, budgets for inter-ministerial coordination mechanisms, and budgets to implement environmental compliance monitoring. This last issue exists even though it is acknowledged that the system for industry-related project follow-up is their responsibility.

On inter-ministerial coordination, there are issues related to reinjection of wells, environmental responsibility for contingencies caused by voluntary third-party actions, and pending development for controlling offshore activity. These issues are related to the lack of regulations for reinjection, the mismatch between central ministries and autonomous regional corporations regarding waste management, and the need to enforce policies for offshore waste disposal, including residual produced water.

Policies and legal frameworks and governance related to the oil and gas sector

Section 1.2 of Annex 4 provides a brief overview of the status of relevant legislation in Colombia with reference to environmental management as applied to the oil and gas sector[1]. In general, Colombia has an adequate legislative framework in place to support most aspects of environmental management in the oil and gas sector. One concern identified was the lack of legislation to formalize the SEA for this sector (and others). Another one was on the uncertainty over the existence of operating procedures to address non-compliance by operators issued with environmental licenses based on approved environmental impact assessment (EIA) and whether they have been operationalized. The third concern was whether the best-practice procedures of environmental audits were being practiced.

During the final review, ANLA concluded that there are procedures for environmental monitoring created by multidisciplinary teams of professionals and that, in case of any non-compliance, inquiries and sanctions to responsible companies would be issued. Another concern was also related to the final part of EIA public review process; the deadline for submitting final EIA to the public for its review is not specified.

The final concern was related to the policy and legal framework associated with decommissioning of oil and gas wells and infrastructure, where the existence of environmental and socio-economic risk assessments related to decommissioning could not be ascertained, even relating to older projects in which well locations may not be precisely located.

National technical capacities related to environmental management of the oil and gas sector

The way environmental management of oil and gas activities has been implemented, including through long-established reviews of environmental impact assessments (EIAs) is described in Section 1.3 of Annex 4. The few potential concerns identified relate to training of personnel, following a regular, institutionalized regime. Two other concerns identified are the lack of promotion of clean energy technologies, and the weak attention given to gender-specific data regarding EIAs and the follow-up to environmental impact (as well as socioeconomic impact).

[1]The study conducted only a brief overview of the legislation.

NGO and civil society/citizen participation and local communities

There is a long history of non-governmental organization (NGO) activity in Colombia, as detailed in Section 1.4 of Annex 4. Many NGOs are actively engaged in social and environmental issues associated with the oil and gas sector, more recently focused on non-conventional exploration methods such as fracking. Often supporting the local communities in the vicinity of oil operations, NGOs continue to have an important role to play in assisting communities to be part of the discussion and decisions related to exploration and accidental events in their areas. As described in Section 1.5 of Annex 4, concerns are raised over access that local communities should or may have to exploration sites, and the need for capacity building of communities (and associated NGOs) to improve their participation in the decision-making process. A third concern is raised on how grievance procedures are formally recognized and followed to their resolution.

Academia

As described in Section 1.6 of Annex 4, the academic sector has participated extensively in various roles associated with the oil and gas industry. The only real concern that came to light was the lack of more dedicated post-graduate course related to the current and future technological, geological and environmental aspects that are expected to be relevant to unconventional, offshore and enhanced oil recovery efforts.

Print and media

Section 1.7 of Annex 4 provides a description of how this sector is active in the country and identified one concern that if addressed might contribute to a more thorough portrayal of the activities and consequences related to the oil and gas sector in Colombia. To contribute to improving coverage, technical training and awareness raising is needed for the media on current and future aspects such as unconventional, offshore and enhanced oil recovery technology and associated socio-economic and environmental issues.

Private sector

As described in Section 1.8 of Annex 4, Colombia has a thriving private sector that actively participates in the oil and gas sector, most notably by the now partly privatized Ecopetrol.

Foreign companies do not necessarily have to be related to Ecopetrol, as was the case with association contracts. Since the establishment of ANH in 2003, it is possible for any company that fulfils the requirements and participates in a process to win the adjudication of an Exploration and Production contract, being Ecopetrol part of this process as well. Other companies are involved in support services to the major exploration firms, and consultancy companies provide environmental impact assessment services. The suitability of EIA consultants and how to review their work was also raised as a concern.

Emergency preparedness and response

As described in Section 1.9 of Annex 4, Colombia has a well-established National Contingency Plan (NCP) since 1999 (fully updated in 2021), for responding to spills of oil products and harmful substances at sea and continental waters. In general, there is also a structured institutional response in place, with assigned roles and responsibilities, systems and arrangements. The areas of concern are possible need for strengthening on early warning systems (including preparedness for events, especially in the offshore environment) and personnel training, where in both cases there is very little in place and much more could be done to improve the situation, including to reflect risk from conflicts.

The recent update to the NCP, carried out by the Ministry of Environment and Sustainable Development (Minambiente), confirms that a procedure that establishes advanced techniques for oil spill response is yet to be applied.

Contaminated sites and their remediation

Section 2.1 of Annex 4 describes the background situation with thousands of contaminated sites across the country, and the on-going comprehensive mapping of orphan contamination sites (or '*pasivos*') that could benefit from support in prioritizing sites for remediation. Most '*pasivos*' are related to third-party induced events that are consequence of the country's internal conflict that has affected oil infrastructure. A second area of concern was the much-needed training on contaminated site remediation techniques appropriate for the Colombia context and in light of future developments in the sector.

Emissions and Flaring of Gas

Section 2.2 of Annex 4 analyses the current regime on emissions reduction in Colombia. The Government of Colombia officially submitted its revised Nationally Determined Contribution (NDC) on December 29, 2020. Colombia's NDC is considered one of the most ambitious in the Latin America and Caribbean region thus far and is much more closely aligned with the country's objective of achieving carbon neutrality by 2050. It aims to reduce greenhouse gases by 51% (169.4 MtCO2e) and black carbon emissions by 40% in 2030 compared to 2014 levels. At COP26 in November 2021, Colombia joined the Global Methane Pledge and in February 2022 signed a resolution (Resolution 40066/22) to reduce methane in the hydrocarbons sector. Methane has a global warming potential 28-34 times greater than CO2. The goal is to reduce emissions by 11.2 tons of CO2e by 2030. These recent developments are very promising, and attention should be focused on the monitoring and compliance with these regulations in order to fulfil Colombia's international commitments towards emissions reduction. National regulatory bodies should be adequately equipped to fulfil their mandates as well.

Accredited laboratories

A review of the status of accredited laboratories in the country is reportedly underway at the Minambiente, as described in Section 2.3 of Annex 4, which is important to determine whether there are enough facilities to service the oil and gas sector, especially considering future developments in the sector. The main concern is in-country capacity related to the accreditation of the required analytical facilities.

Table A1. Summary of key concerns identified that need to be validated before recommendations are proposed, as presented in the Preliminary CNA Report.

No.	Annex 4 Section and Key Concern
	SECTION 1.1 **National institutions and capacities related to environment and oil industry**
1	Financial means to equip and operate the responsible entities to analyse data from the operators.
2	Adequate budgets for inter-ministerial coordination mechanisms.
3	Adequate budgets to implement environmental compliance monitoring.
	SECTION 1.2 **National policy/legal/regulatory frameworks/governance**
4	The apparent lack of legal basis for implementation of Strategic Environmental Assessment (SEAs).
5	Uncertainty over the existence of operating procedures to address non-compliance by operators issued with environmental licenses based on the approved environmental impact assessment (EIA) and whether they have been operationalized. Note: Upon final review, it was confirmed that there are environmental control procedures and that sanctions are imposed to those companies responsible for any non-compliance with environmental obligations.
6	Whether the best-practice procedure of environmental audits was being practiced after completion of projects.
7	Uncertainties over the qualifications of individuals and firms conducting EIAs.
8	Period for sharing the final EIA with the public for their review is not specified.
9	Existence of environmental or socio-economic risk assessments related to decommissioning of oil and gas wells and infrastructure.

No.	Annex 4 Section and Key Concern
	SECTION 1.3 **National technical capacities on environmental management of oil and gas sector**
10	Absence of regular and institutionalized personnel training to keep up with changes in oil and gas technologies and associated environmental risks, at central and regional levels.
11	The absence of an initiative or guidelines to promote clean technologies. Note: This has since been updated in August 2022 with respect to offshore wind.
12	Uncertainties on whether there are any clear monitoring procedures to track gender mainstreaming and boost gender equality across the oil and gas sector.
	SECTION 1.4 **Non-governmental organization and civil society**
13	Clarity on how NGO/local communities are allowed access to sites that affect local livelihoods.
	SECTION 1.5 **Local community participation**
14	Need for capacity building within NGO/local communities for improved participation and communication to improve the two-way dialogue on environmental issues.
15	Clarity on how grievance procedures are formally recognized and followed to their resolution.
	SECTION 1.6 **Academia**
16	Need of dedicated post-graduate courses related to future technological, geological and environmental aspects relevant to unconventional, offshore and enhanced oil recovery.

No.	Annex 4 Section and Key Concern
	SECTION 1.7 **Print, visual and social media**
17	Need for technical training and awareness raising for the media on current and future aspects such as unconventional, offshore and enhanced oil recovery technology and associated socio-economic and environmental issues.
	SECTION 1.8 **Private sector**
–	No key concerns were raised associated with private sector involvement in environmental aspects of the oil and gas sector of Colombia.
	SECTION 1.9 **Emergency preparedness and response**
18	Complete the update of the National Contingency Plan (1991) and include conflict risk assessment. Note: Update completed in 2021
19	Early warning system and preparedness for offshore emergencies/disasters need attention.
20	Capacity training programmes to reflect national capacity needs, aligned with unconventional, offshore and enhanced oil recovery technology and associated socio-economic and environmental issues.
	SECTION 2.1 **Contaminated sites and their remediation**
21	Support for the on-going comprehensive mapping of orphan contamination sites (or 'pasivos') and prioritizing for remediation.
22	Need for training on contaminated site remediation techniques appropriate for the Colombia context.

No.	Annex 4 Section and Key Concern
	SECTION 2.2 **Emissions and flaring of gas**
23	Need for monitoring of flaring and other sector-related emissions.
	SECTION 2.3 **Accredited laboratories**
24	Conduct an evaluation of needs for in-country capacity building related to the accreditation of analytical facilities for oil and gas sector monitoring considering future developments in the sector.
	SECTION 2.4 **Fracking**
25	Need for a nation-wide risk assessment to determine high risk areas related to unconventional exploration techniques to feed into a spatial planning/SEA process.
26	Requirements for in-country capacity building related to unconventional oil and gas sector exploration and monitoring considering future developments in the sector.
	SECTION 2.5 **Offshore exploration**
27	Lack of skills in and alignment between oversight institutions related to offshore oil and gas activities and risks.
	SECTION 2.6 **Environmental data relevant to the oil and gas sector**
28	Lack of an environmental database for use in integrated spatial planning to address multiple environmental, social and economic interests for oil and gas development.
29	The lack of an oil spill sensitivity atlas for the Caribbean Sea coast of Colombia where oil and gas exploration and production are already underway.

Fracking

Based on reviews of NGOs concerns, feedback from numerous individuals in the Government, at central and regional offices, and academia, detailed in Section 2.4 of Annex 4, concerns over fracking ranked the highest. Given the interest from the 2018-2022 Government to pursue diverse approaches to increase energy production options, currently it is uncertain how fracking will develop in Colombia. Nevertheless, the two concerns that have emerged are still relevant pending the outcome of on-going reviews in the use of this technology. These are: the need for a nation-wide risk assessment to determine high risk areas related to unconventional exploration techniques, which could feed into a spatial planning/SEA process; and the requirements for in-country capacity building related to unconventional oil and gas sector exploration and monitoring, considering likely future developments in the sector.

Offshore exploration

As described in Section 2.5 of Annex 4, the main concern was the lack of skills within the oversight institutions related to offshore oil spill response behaviour and the associated use of dispersants, as well as the overall risks to marine habitats.

Environmental data relevant to the oil and gas sector

Section 2.6 of Annex 4 describes the existence of datasets used to monitor air quality and terrestrial biodiversity. The concerns that arose were the apparent lack of an environmental database for use in integrated spatial planning to addresses multiple environmental, social and economic interests for oil and gas and the absence of an oil spill sensitivity atlas tailored for the Caribbean coast.

Over the course of this analysis, the *Preliminary* CNA initially identified 29 Key Areas of concerns, from 15 distinct categories related to environmental management of the oil and gas sector in Colombia. These concerns formed the basis of the latter validation process, which subsequently led to recommendations that can inform future efforts in the sector.

The five highest priority areas of concern identified in this latter validation process that need to be the focus of capacity strengthening efforts are:

1. National technical capacity (knowledge and skills), including at sub-national level, in relation to strengthening environmental governance and management in the petroleum sector to prevent and minimize potential socio-environmental impacts.
2. Prevention of emergencies/disasters associated with unconventional oil recovery ('fracking'), offshore exploration and production and pipeline monitoring.
3. Development of a share-access environmental database for use in integrated spatial planning and monitoring to address multiple environmental, social and economic issues in relation to oil and gas development, including offshore.
4. A strategic environmental analysis of the oil industry which results in a vision and mapping plan to inform the oil industry, including defining the most pollution-sensitive geographical areas, and on the offshore side, to guide individual impact studies.
5. Strengthening capacities and legislation to promote and monitor reduction of flaring and emission of greenhouse gases.

The next steps typically would include the following:

1. Disseminate the *Final* CNA Report to relevant institutions as well as sub-national Government officials,
2. Re-visit the recommendations within institutions and where necessary with relevant development partners, and
3. Agree on 'owner' institutions to devise the capacity development strategy and plans to implement the recommendations on the five priority areas of concern (and others) for strengthening environmental management in the oil and gas sector.

The resulting capacity development plan for strengthening environmental management in the oil and gas sector can contribute towards strengthening the capacity of the Colombian Government institutions to manage environmental and social aspects related to the oil and gas sector.

This agreed roadmap for Government institutions and partners to address these priority concerns will help ensure that future development in the oil and gas sector over the coming decade will be conducted in a sustainable manner while meeting development priorities.

1. INTRODUCTION – THE OIL AND GAS SECTOR IN COLOMBIA

1.1 Recent history

Colombia's political history as a modern state is marked by a long and brutal civil war that started with the launch of the communist insurgency in the 1960s, when the Fuerzas Armadas Revolucionarias de Colombia-Ejército Popular (or FARC-EP), the revolutionary armed forces of Colombia and popular army, and Ejército de Liberación Nacional (ELN) or national liberation army were created.

The new century witnessed renewed conflicts, targeting oil and gas and mining industries, thereby providing new funding source for armed groups (Sánchez et al., 2013). Many areas identified as key for the extractives overlap with areas of high levels of conflict. This has resulted in economic consequences such as reduction in the exports and taxes, but also in environmental impacts and social service provision such as water and sanitation – issues that continue to persist.

The Government and the armed groups nevertheless made significant recent progress towards improving security and stability, with paramilitary groups demobilized in the early 2000s. A peace process with the FARC-EP was opened in 2012 and an historic ceasefire agreement was approved by Colombia's Congress in late 2016.

The ceasefire created hope that associated environmental challenges would receive higher priority from Government, and national agencies take into account oil and gas environmental challenges in their post-conflict strategies. For instance, the National Planning Department estimated that ending the conflict could save up to USD 636 million per year on avoided costs in cleaning, and losses in oil and ecosystem services. Under the 2018 government, a new strategy of the Ministry of Mines, in association with the National Hydrocarbons Energy (ANH), seeks to extend territorial peace by reaching social agreements between local communities and the oil and gas sector.

1.2 Economic overview

Despite the intensity and duration of conflict, Colombia's economy has grown in recent decades. It is the world's fourth largest coal exporter, the second largest coffee and cut flowers exporter, and Latin America's fourth largest oil producer. Economic growth is partly due to the promotion of large-scale investments in strategic sectors such as oil, mining, energy, agriculture, and infrastructure. As the coffee economy receded in the 1980s, and the economy modernized and diversified, the extractive sector emerged as the new motor for development. Exports from extractives increased from 36% in 1995 to more than 50% since 2010 (reaching its peak of 67% in 2013) and in 2015, oil accounted for 20% of the State's revenues. Oil revenue (as a percentage of GDP) in Colombia was reported at 28% in 2021, according to the World Bank collection of development indicators, down from almost 4,3% of GDP in 2014 according the National Administrative Department for Statistics (*DANE*).

1.3 Environmental overview

According to Mongabay, in 2016 Colombia was ranked the second most biodiverse country in the world, with forest covering more than half the territory. Its climate is tropical, but it presents variations in each of its six natural regions, from the Andes Mountain range, the Pacific coastal region, the plains, the Amazon rain forests, the Caribbean coastal region and the islands in Atlantic and Pacific Oceans.

However, Colombia's rich ecosystems and biodiversity are under significant pressure from extractive industries, farming, road traffic and urbanisation. Armed conflict has given rise to many environmental concerns associated with illegal mining, cultivation of illicit drug crops and deforestation. The conflict has also restricted the Government's capacity to access protected areas and to manage natural resources. In recent years, deforestation, soil erosion and land degradation have increased in areas of agricultural expansion, illegal crop cultivation and illegal mining, resulting in an estimated loss of 0.7% of GDP annually.

Water resources are also under significant pressure. For instance, gold digging using mercury and reliance on chemicals in coca-refining have degraded the quality of the country's vast river network, as well as caused dire public health problems (News, 2014; EFFACE, 2012). According to Colombia's National Planning Department, the country ranks second after China in mercury pollution. Moreover, decreasing water levels are expected due to climate change, with reduced runoff projected overall in the Andes watersheds because of decreased precipitation, higher temperatures, degradation of highland wetlands, and loss of glaciers, among others. Pressure on water supply will also increase because most of the Colombian population lives in the Andean regions, and there is a weak wastewater treatment system that aggravates pollution cases (World Bank, 2015).

Deforestation, land degradation and water pollution affect local communities' livelihoods and health while limiting their opportunities to develop. Priorities of the Government for the post-conflict phase are promoting sustainable technologies, practices and economic alternatives that make it possible to maximize the environmental dividends of peace (Santos, 2016).

1.4 Early oil and gas exploration

Oil exploration activities in Colombia started in 1905 with the establishment of two well-known concessions called "Barco" and "De Mares", where production began in 1921. State-owned Colombian Petroleum Enterprise (Ecopetrol) was authorized by the Government in 1969 to extend production on other concessions. The discovery of giant fields such as Chuchupa (1973), Caño Limón (1983), Cusiana (1988) and Cupiaga (1993), soon placed Colombia in the spotlight for the most important oil multinationals. By mid-1980, Colombia became an oil exporter as production volumes increased significantly.

From 2000 to 2007, Colombia faced a period of declining production, drilling only between 15 and 70 wells per year, due in large part to progressive depletion of older fields, attacks on pipelines, and new regulation increasing the State's share of production revenues and reducing private sector investment.

However, post 2007, Colombia experienced an oil boom, with production increasing from approximately 500,000 barrels per day to over 1 million barrels per day in 2015, surpassing the 1999 peak. The huge increase was possible due to the massive use of secondary and tertiary recovery techniques on old fields, which were finally economically viable due to high global oil prices. Investment incentives generated by the new contractual mechanisms between ANH and those interested in exploring the designated areas diversified the risk assumed by them, which also promoted development. An improved security situation and better fiscal terms with the 2003 energy reforms were also helpful.

1.5 Recent development and discoveries

Oil production has recently fallen to 748,286 barrels per day (in July 2022[2]), with one of the main challenges being declining reserves – only 2039 million of barrels of proven reserves existed in 2021, compared to the 2,308 million in 2014. For natural gas, proven reserves increased in recent years; however, their total amount is still relatively modest, with 122 million of tons of oil equivalent. Despite reduced production, Colombia remains Latin America's fourth leading oil producer, with production areas spread around the whole country (Figure 1).

It is understood that Colombia risks losing oil self-sufficiency in 2060. However, in the short term, for every barrel produced in 2021 the country was able to add 1.83 barrels to its proven reserves. As a result, the average useful life of these reserves increased from 6.3 to 7.6 years (Figure 2A). Similarly with gas, during 2021, production reached 395 giga cubic feet, 4% more than in 2020, when this figure reached 381 giga cubic feet. For every giga-cubic foot produced in 2021, 1.54 giga-cubic feet were added to reserves. As a result, the average useful life increased from 7.7 to 8 years (Figure 2B).

The former Minister of Mines and Energy stated in 2014 that "the future of Colombia's hydrocarbons will come from three sources: unconventional, offshore and enhanced oil recovery." There is widespread optimism around offshore initiatives, with several exploration activities underway in the Caribbean Sea. For now, Chuchupa is the only operating offshore field in the Caribbean Sea and the main source of gas in Colombia. However, deep water offshore areas remain relatively unexplored due to the lack of supply chains and infrastructure. In the ANH's fourth round of bidding in 2021, of the total 23 blocks offered, 4 were offshore areas in the Pacific Ocean, in the Choco and Tumaco offshore basins (Figure 3). Meanwhile, Colombia's Caribbean offshore basins have attracted foreign interest since 2019 (e.g. Shell, Exxon and Repsol), who, together with Ecopetrol, are planning more offshore drilling in the Caribbean during 2022.

[2]Overseen oil production per field (barrels per calendar day - bpcd). https://www.anh.gov.co/es/operaciones-y-regal%C3%ADas/sistemas-integrados-operaciones/estad%C3%ADsticas-de-producci%C3%B3n/

Figure 1. Production areas (red), exploration (yellow), technical assessment from ANH (blue) and special research project under hydrocarbon contract (green), in November 2022. Source: ANH, 2022.

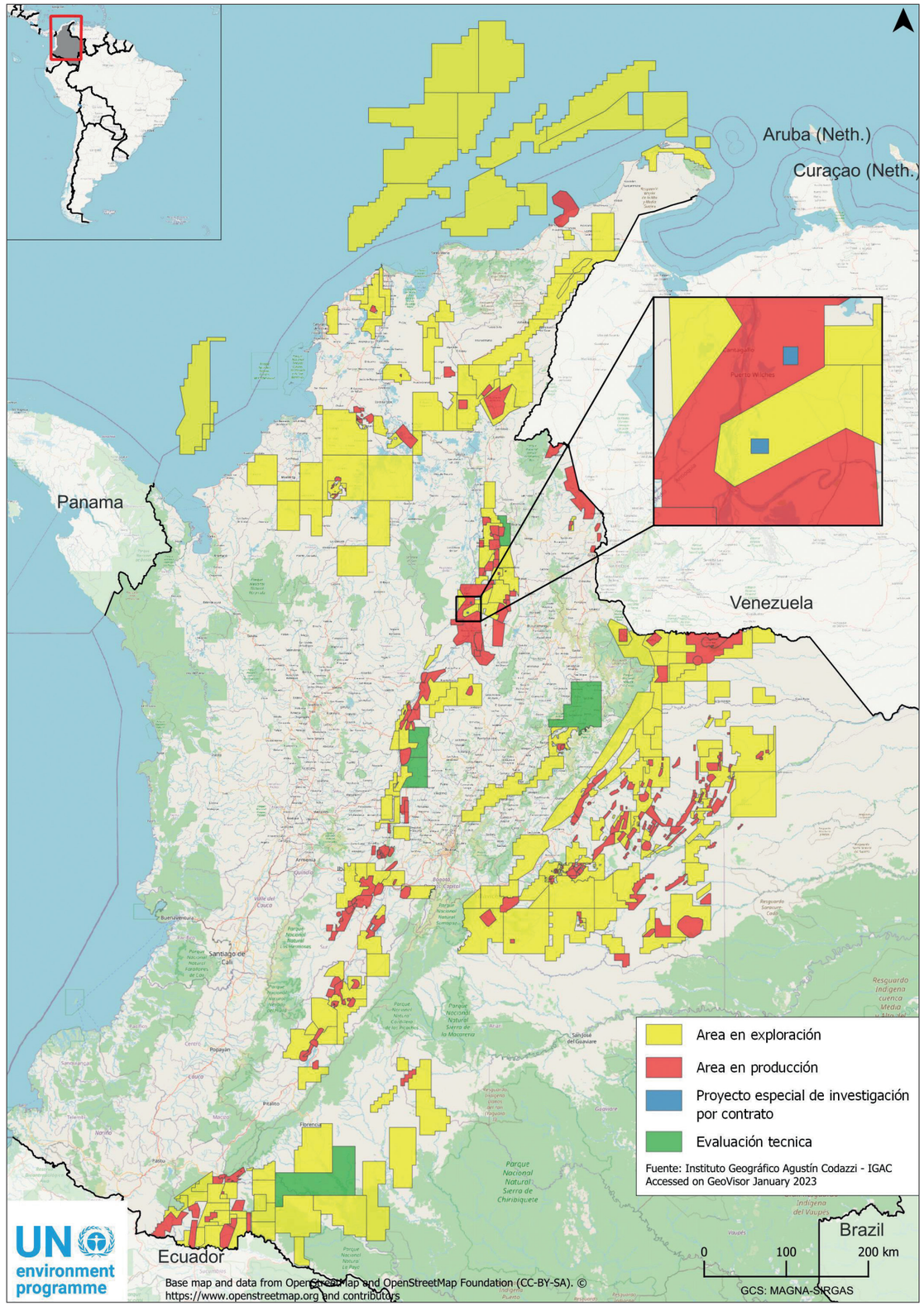
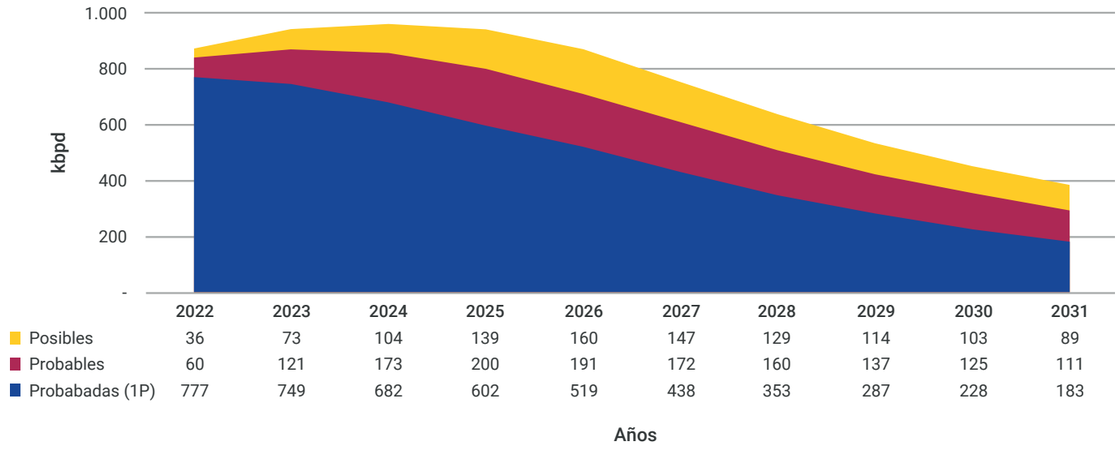
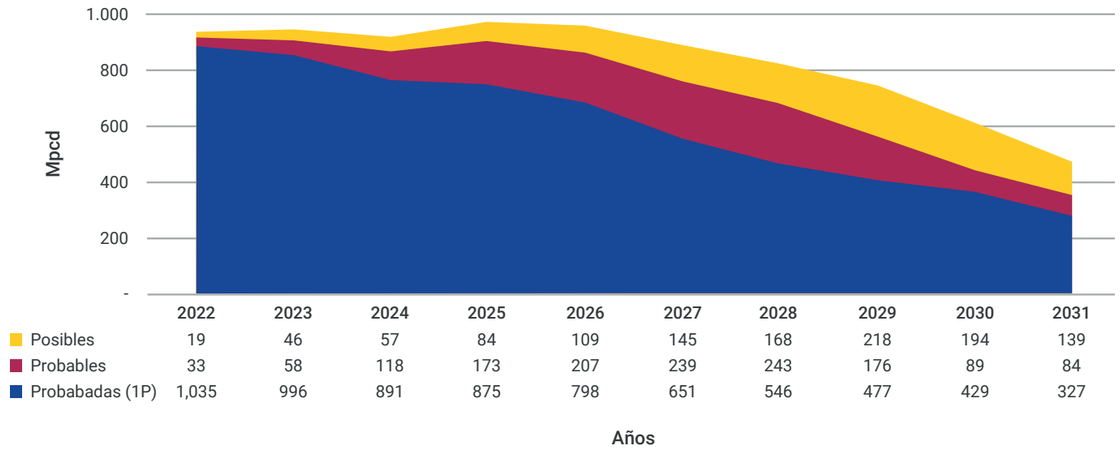


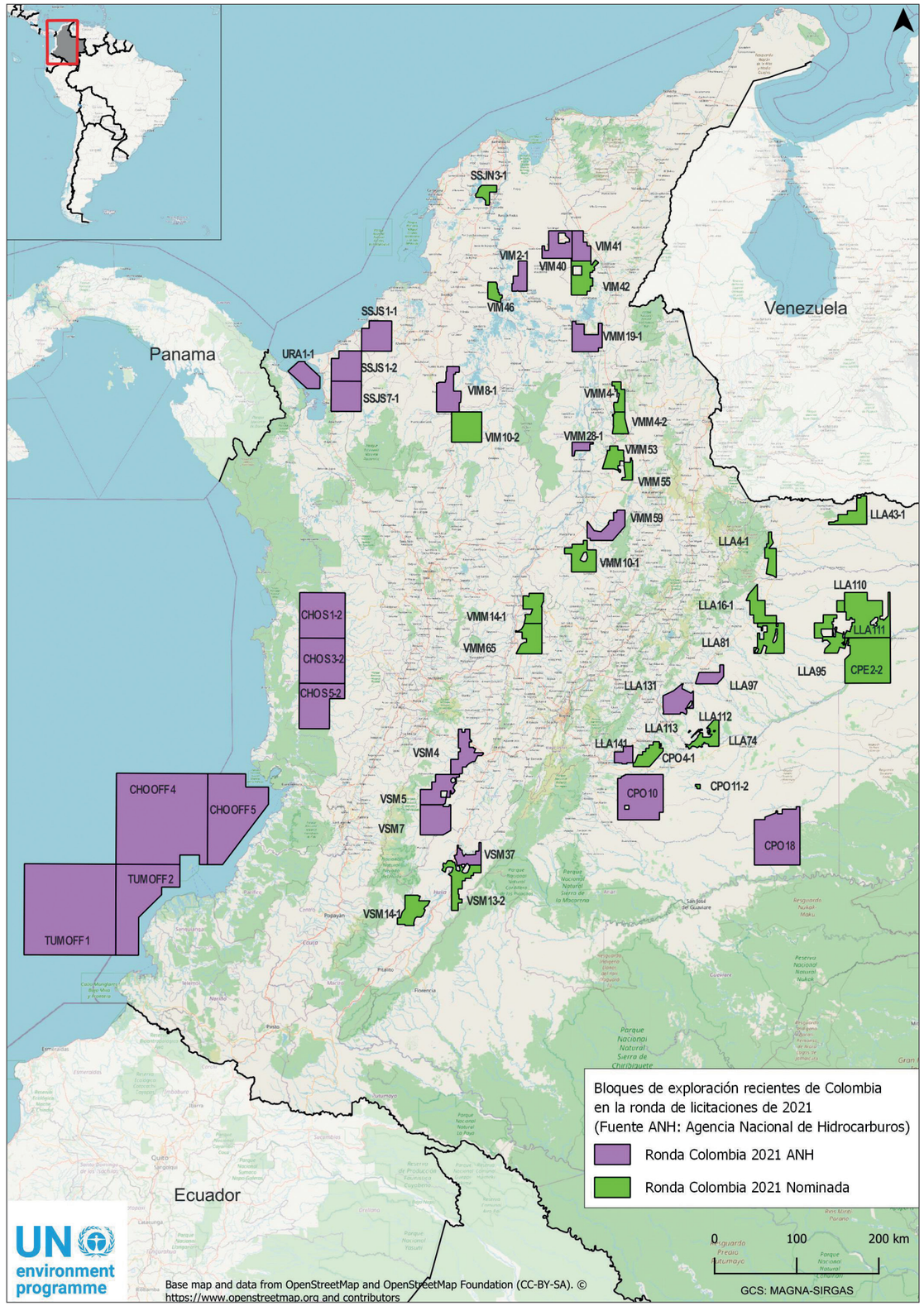
Figure 2. A) Depletion forecast by reserve category in thousands of barrels per day.
B) Depletion forecast by reserve category of natural gas in millions of cubic feet per day.
Source: ANH, 2022[3].





[3]https://www.anh.gov.co/documents/14067/Presentaci%C3%B3n_Balance_de_Reservas_-_IRR2021_20-05-2022.pdf

Figure 3. Colombia's Recent offered exploration blocks during the round of licenses of 2021.
Source: ANH, 2022.



According to the U.S. Department of Energy, Colombia presents a high potential for unconventional hydrocarbons, coalbed methane, gas and oil shale and gas hydrate deposits. Reserves have been found, mainly in the Middle Magdalena and Bogotá basins. Although the current government's vision is focused more on diversifying energy sources, with a strong focus on renewables, attracting foreign investors through regulations that promote industries such as oil and gas continues, including in offshore areas. Defining the terms and conditions to which unconventional reservoirs will be sustainably developed and whether the new government will support such activities in a timely manner remains unclear (Lugo and Ricciulli, 2019). However, as the COVID-19 pandemic impacted demand for and prices of oil, Colombian drilling activity could fall to its lowest level in almost two decades according to a report by the contractor Campetrol (2020).

1.6 Reducing environmental risks in the development of the oil and gas sector

The Government of Colombia is keen to ensure that activities associated with future oil and gas production apply environmental management best practices and support sustainable development. In support of this, several international development partners, including the Canadian Government, the Netherlands Commission for Environmental Assessment (NCEA) and the Extractive Industries Transparency Initiative (EITI), as well as the Government of Norway's Oil for Development Programme (OfD) are assisting the Government of Colombia in managing its oil and gas sector.

Since 2003 the NCEA provided capacity development activities to Colombian authorities, related specifically to strategic environmental assessments (SEA), through national workshops, involving the World Bank, focused on subsectors hydrocarbons, mining, energy, agriculture, infrastructure and transport). The 2050 Climate Change Management Plan for the mining and energy sectors is an update that aims to support the 2021 Energy Transition Law, aligned with the Colombian Nationally Determined Contribution (NDC) and climate strategy to Paris Agreement. It also targets carbon neutrality by 2050 and develops the necessary strategic actions for achieving it. Nowadays it is completely possible for the oil and gas production to be conducted with nearly zero methane emissions (less than 0,20% intensity). This is easier and cheaper when done from the start, so every new production should be designed with commitment to match this standard.

The Government of Norway has also been providing petroleum related support to Colombia through its OfD Programme. OfD is a global programme which aims towards poverty reduction and sustainable development through responsible management of petroleum resources. The programme has four components, which together form a holistic approach to petroleum management. These components are finance, resource management, safety and environment. The main approach is support for capacity development through institutional collaboration and exchange of expertise, involving Norwegian public institutions working together with public institutions in partner countries.

UNEP and the Government of Norway have a collaboration (2016–2024) to enhance capacities for improved environmental management in the oil and gas sectors in countries supported by Norway's OfD Programme. Under this collaboration, UNEP aims to reduce environmental risks, including emissions sources (particularly methane), associated with development of hydrocarbon resources and provide technical assistance and capacity building to OfD countries, including Colombia. In 2020, UNEP initiated this Institutional Capacity Needs Assessment (CNA) on Strengthening Environmental Management in the oil and gas sector.

2. LEGAL AND POLICY INSTRUMENTS RELEVANT TO ENVIRONMENT AND OIL AND GAS IN COLOMBIA

The Government of Colombia regulates petroleum activities in its jurisdiction and develop strategic policies to develop its resources. This often involves specialized legislation (such as petroleum, natural gas, or hydrocarbons law), which operates with other relevant legislation such as environmental laws. Table 1 provides a list of the status of the policies relevant to strengthening environmental governance and management in the oil and gas sector.

Table 2 presents the current status of Colombia against a checklist of legislative and regulatory tools which UNEP developed to assess environmental governance in the upstream oil and gas sector based on international best practice. Similarly, Table 3 takes a broader look at the existence of legal provisions across relevant legal and regulatory instruments that can address the key areas of concern for environmental management and governance in relation to oil and gas development.

Table 1. Policies relevant to the oil and gas sector.

Thematic Area/Scope	Title of Policies related to environment and oil and gas in Colombia	Year	Status
Oil Governance	Documento CONPES 3762 – Lineamientos de Política para el Desarrollo de Proyectos de Interés Nacional y Estratégicos- Pines	2013	
	Documento CONPES 3990 – Colombia Potencia Bioceánica Sostenible 2030	2020	
Environment/ Biophysical	National Forest Policy (Política Nacional de Bosques)	1996	
	National Biodiversity Policy (Política Nacional de Biodiversidad)	1995	
	National Policy or the Integrated Management of Biodiversity and Ecosystem Services (Política Nacional o Manejo Integral de Servicios de Biodiversidad y Ecosistemas)	2011	
Otros (socioeconómicos, etc.)	Colombia Sustainable Bioceanic Power 2030 (Documento CONPES 3990 – Colombia Potencia Bioceánica Sostenible 2030)	2020	
	Energy Transition Policy (Documento CONPES 4075 – Política de Transición Energética)	2022	
Disaster Management	National Contingency Plan against Spills of Hydrocarbons Derivatives and Harmful Substances Decree 1868 (Plan Nacional de Contingencia para el Derrame de Hidrocarburos y Sustancias Nocivas – Decreto 1868)	2021	
	Resolution 1209	2018	
	Resolution 1767	2016	

Legend
Available | Draft status | Available but under review | Not Available/in process of formulation

Table 2. Legislation relevant to the oil and gas sector.

Relevant Laws & Regulations	Status	Full title of legal instrument in Colombia	Year	Responsible Authority
Constitutional Provisions		Political Constitution of Colombia	1991	Congress of the Republic
Framework Environmental Act		National Code of Renewable Natural Resources and Protection of the Environment (Decree 2811/1974) (Código Nacional de Recursos Naturales Renovables y Protección del Medio Ambiente (Decreto 2811/1974)	1974	Minambiente
		Law 99/1993	1993	Minambiente
		National Environmental Policy for the Sustainable Development of the Ocean Spaces and the Coastal and Insular Areas of Colombia (PNAOCI) (Política Nacional Ambiental para el Desarrollo Sostenible de los Espacios Oceánicos y de las Zonas Costeras e Insulares de Colombia – PNAOCI)	2000	Minambiente
		Decree 1076/2015	2015	Minambiente
		National Council for Economic and Social Policy – Conpes 39990 "Colombia Sustainable Bioceanic Power 2030" (Consejo Nacional de Política Económica y Social — Conpes 3990 "Colombia Potencia Bioceánica Sostenible 2030)	2020	National Council for Economic and Social Policy (Consejo Nacional de Política Económica y Social)
		National Council for Economic and Social Policy of CONPES 4050 Policy for the consolidation of the National System of Protected Areas – SINAP 2021 (Consejo Nacional de Política Económica y Social — CONPES CONPES 4050 Política para la consolidación del Sistema Nacional de Áreas Protegidas – SINAP 2021)	2021	National Council for Economic and Social Policy (Consejo Nacional de Política Económica y Social)
Framework Oil and Gas Act		Colombian Petroleum Code (Decree 1056/1953)	1953	Ministry of Mines and Energy (Ministerio de Minas y Energía)
Framework on Water Resources Management		Decree 1076/2015	2015	Minambiente
		Resolution 883/2018	2018	Minambiente
		Decree 1120/2013 (compiled in Decree 1076/2015)	2013	Dirección General Marítima (DIMAR)
		Decree 1875/1979	1979	Ministerio de Agricultura
		Decree 1640	2012	Minambiente

Relevant Laws & Regulations	Status	Full title of legal instrument in Colombia	Year	Responsible Authority
Framework Act on Disaster Management		Law 1523/2012	2012	National Unit for Disaster Risk Management (UNGRD) of Colombia Unidad Nacional para la Gestión del Riesgo de Desastres
		Law 12/1981	1981	UNGRD
		Resolution 887/2019	2019	Director General Maritime – Ministry of Defence (DIMAR)
		Decree 2157/2017	2017	UNGRD
		Decree 1868/2021	2021	UNGRD
		Decree 2157	2017	Administrative Department of the Presidency of the Republic
Framework on Land Use Planning		Decree 2363/2015	2015	National Land Agency (Agencia Nacional de Tierras ANT) Ministry of Agriculture and Rural Development Ministerio de Agricultura y Desarrollo Rural (MADR)
Framework on Land Acquisition (including Resettlement)		Law 1274/2009	2009	MME Municipal Civil Judge of the Jurisdiction Juez Civil Municipal de la jurisdicción
Framework on Protected Areas		Decree 2372/2010 (compiled in Decree 1076/2015)	2010	Minambiente
Regulations on Protection of Biodiversity		Law 165/1995	1995	Minambiente
		Law 17/1981	1981	Minambiente
		Law 56/1987	1987	Minambiente
		Law 1348/2009	2009	Minambiente
		Decree 383/2010	2010	Minambiente
		Resolution 207/2010	2010	Minambiente
		Resolution 192/2014	2014	Minambiente
		Resolution 2724/2017	2017	Minambiente
		Resolution 1912/2017	2017	Minambiente
		Decree 281/2021	2021	Minambiente
Regulations on Strategic Environmental Assessment				
Regulations on Environmental Impact Assessment (including resettlement)		Decree 2041 of 2014 compiled in Decree 1076/2015	2015	Minambiente

Relevant Laws & Regulations	Status	Full title of legal instrument in Colombia	Year	Responsible Authority
Regulations on Audits and Inspections		Resolution 415/2010	2010	Minambiente
Regulations on Water Pollution		Law 56/1987	1987	Minambiente
		Law 885/2004	2004	Minambiente
		Decrees 1640/2012, 1541/1978, 3930/2010, 1594/1984 compiled with Decree 1076/2015	2012	Minambiente
		Decree 1120/2013 (compiled with Decree 1076/2015)	2013	Minambiente
		Resolution 883.2018	2018	Minambiente
		Resolution 0477/2012	2012	DIMAR
		Resolution 0645/2014	2014	DIMAR
		Resolution 0004/2018	2018	DIMAR
		Resolution 1131/2019	2019	DIMAR
		Resolution 0229/2020	2020	DIMAR
		Resolution 0416/2020	2020	DIMAR
		Resolution 0510/2020	2020	DIMAR
Regulations on Waste Management (municipal/solid/ liquid waste)		Decree 1077/2015	2015	Ministry of Housing, Cities and Territory Ministerio de Vivienda, Ciudad y Territorio
Regulations on the Management of Hazardous Waste		Decree 4741/2005, complied with Decree 1076/2015	2005	Minambiente
		Resolution 0645/2014	2014	DIMAR
		Resolution 0887/2019	2019	DIMAR
Regulations on Oil Management		Resolution 181495 de 2009	2009	MME
		Agreement 4/2012	2012	MME
		Agreement 3/2014	2014	MME
		Decree 1073/2015	2015	MME
		Resolution 40048/2015	2015	MME
		Resolution 40295/2020	2020	MME
Regulations on Unconventional Deposits		Resolution 421/2014	2014	Minambiente
		Decree 328/2020	2020	Minambiente
		Resolution 821/2020	2020	Minambiente
Regulations on Chemical Product Management		Decree 4741/2005 complied with Decree 1076/2015	2015	Minambiente
		Decree 1630/2021	2021	Labour Ministry Ministry of Health and Social Protection Ministry of Trade, Industry and Tourism
Regulation on Soil Management/ Contamination		Resolution 699/2021	2021	Minambiente

Relevant Laws & Regulations	Status	Full title of legal instrument in Colombia	Year	Responsible Authority
Regulation on Air Pollution		Resolution 627/2006	2006	Minambiente
		Resolution 909/2008	2008	Minambiente
		Decree 948/1995 compiled with Decree 1076/2015	1995	Minambiente
		Resolution 2254/2017	2017	Minambiente
Regulations on Noise Pollution		Law 8/1980	1980	Minambiente
		Resolution 627/2006	2006	Minambiente
Regulations on Vibrations				
Regulations on Oil Spill Management		Law 12/1981	1981	DIMAR
		Decree 50/2018	2018	Minambiente
		Resolution 0171/2022	2022	UNGRD
		Decree 1868/2021	2021	President of the Republic
Regulations on Decommissioning and Abandonment of Oil and Gas Infrastructure		Resolution 90341/2014	2014	MME
Regulations to Operate in Protected Areas		Decree 2373/2010 complied with Decree 1076/2015	2015	Minambiente
Regulations on Drilling Fluids and Cuttings		Decree 1895/1973	1973	MME
Regulations on the Discharge of Production Water		Law 12/1981	1981	DIMAR
		Decree 1076/2015	2015	Minambiente
		Resolution 631/2015	2015	Minambiente
		Resolution 883/2018	2018	Minambiente
		Resolution 699/2021	2021	Minambiente
Rules on Use of Radioactive Sources in Oil Industry		Decree 567/2000	2000	MME
		Decree 70/2001	2001	MME
		Decree 381/2012	2012	MME
Rules on Community Consultations		Presidential Directive 1/2010	2010	Ministry of Interior and Justice Department of National Planning (Sustainable Territorial Development Directorate, Subdirectorate of Territorial Planning and Development)
		Decree 1397/1996	1996	Ministry of Agriculture and Rural Development (MADR)
		Decree 3770/2008	2008	Ministry of Interior and Justice
		Decree 2957/2010	2010	Ministry of Interior and Justice
		Agreement No 2/2017	2017	ANH
Rules on Use of Dispersants				
Rules on Disposal of Disaster Wastes/ Debris Management		Decree 1875/1979	1979	Ministry of Agriculture
Environmental Quality Standards for Water		Decree 1076/2015	2015	Minambiente
		Decree 1120/2013 complied with Decree 1076/2015	2013	Minambiente
		Resolution 631/2015	2015	Minambiente
Environmental Quality Standards for Water		Resolution 627/2006	2006	Minambiente
		Resolution 909/2008	2008	Minambiente
		Decree 948/1995, complied with Decree 1076/2015	1995	Minambiente
		Resolution 2254/2017	2017	Minambiente
Regulations on Air Emissions, in particular GHG/ Methane emissions		Resolution 0909/2008	2008	Minambiente
		Resolution 2734/2010	2010	Minambiente
		Law 1665/2013	2013	Minambiente
		Resolution 40066/2022	2022	MME
Energy Transition Policy		Law 143/1994	1994	Minambiente
		Law 697/2001	2001	MME
		Law 1665/2013	2013	ANLA
		Law 1715/2014	2014	MME
		Documento CONPES 4075 – Política de Transición Energética	2022	Consejo Nacional de Política Económica y Social

Legend

Available | Draft status | Available but under review | Not Available/in process of formulation

Table 3. Legal Provisions relevant to addressing Key Areas of Concern for the Environmental Governance and Management in the Oil and Gas Sector.

Typical legal provisions needed to support environmental management in the oil and gas sector, based on international best practice	Status	Oil and gas activities – Full title of legal provisions in Colombia	Responsible Authorities
Opening of areas for activities, licensing/permits		Decree 1056/1953	MME
		Decree 1895/1973	MME
		Decree 2324/1984	MME
		Decree 1616/2014	DIMAR
		Decree 2106/2019	DAFP
The Operator's Responsibilities		Decree 1056/1953	MME
		Decree 1895/1973	MME, ANH

Typical legal provisions needed to support environmental management in the oil and gas sector, based on international best practice	Status	Oil and gas activities – Full title of legal provisions in Colombia	Responsible Authorities
General environmental principles like risk as low as reasonable possible (ALARP), continuous improvement, knowledge-based approach, precautionary principle, polluter pays, best available techniques (BAT) e.g.		Decree 1895/1973	MME
		Decree 1875/1979	Ministry of Agriculture
		Law 99/1993	Minambiente
		Decree especial 1124/1999	DIMAR
		Law 508 /1999	ANLA
Pollution control and operator's duty to take measures to prevent, stop and remove pollution		Decree 1056/1953	MME
		Decree 1895/1973	ANH
		Decree 1875/1979	Ministry of Agriculture
		Law 99/1993	Minambiente
Environment management system (operator)		Decree 1299/2008	ANLA
Sensitivity mapping		Decree 1753/1994	Minambiente
Seismic Surveys		Executive Resolution 0181/1968	MME
		Decree 1895/1973	ANH
		Decree 2324/1984	DIMAR
Risk Assessment and Reduction		Law 1523/2012	UNGRD
		Decree 2157/2017	UNGRD
Environmental Assessment of Chemicals		Law 99/1993	Minambiente
		Decree 1630/2021	Labour Ministry Ministry of Health and Social Protection Ministry of Trade, Industry and Tourism
Use, Storage and Discharge of Chemicals		Law 12/1981	DIMAR
		Decree 1630/2021	Labour Ministry Ministry of Health and Social Protection Ministry of Trade, Industry and Tourism
Flaring and venting		Resolución 40066/2022	MME
		Resolution 72145/2014	MEE
Community access to areas of operation		Resolution 0674/2012	DIMAR
Transport (Roads, Pipes, Ships)		Resolution 72145/2014	ANH
		Resolution 0674/2012	DIMAR
Maintenance of Oil and Gas Facilities		Law 1274/2009	MME
		Decree 1073/2015	MME
Energy Use and Production		Law 1665/2013	MME
		Law 1715/2014	MME
		Law 1955/2019 (National Development Plan 2018–2022)	MME
		National Energy Generation Plan 2015–2050 (Plan Nacional de Generación de Energia)	MME
		Generation Transmission 2016 – 2030 Reference Expansion Plan (Plan Referencial de Expansión de la Generación – Transmisión 2016-2030)	MME
		Indicative Action Plan (PAI) 2017 – 2022 to develop the Energy Rational and Efficient Use Programme (PROURE) – Plan de Acción Indicativo (PAI) 2017-2022 para desarrollar el Programa de Uso Racional de la Energia	MME
		Decree 829/2020	Colombian Mining and Energy Planning Agency
Formation testing, drill stem testing		Decree 1895/1973	MME
Environmental Monitoring		Law 12/1981	DIMAR
		Decree 1706/1999	ANLA
		Resolution 012/2007	ANH
Environmental Data Management and Coordination		Law 99/1993	Minambiente
		Special Decree 1124/1999	Minambiente
		Law 508 /1999	MME
Oil and Gas Treatment – Separation processing		Decree 1895/1973	MME
Decommissioning/abandonment		Resolution 90341/2014	ANH MME
		Decree 1076/2015	Minambiente
Liabilities and Damages – Compensation		Decree 1875/1979	DIMAR
		Law 491/1999	Minambiente
		Decree 1073/2015	MME
		Agreement 08/2004	ANH
		Agreement 04/2012	ANH
		Agreement 02/2017	ANH
Production Sharing Agreements		Joint Operating Agreement 2018 – Shared Operation Agreement 2018	ANH

Legend

Available | Draft status | Available but under review | Not Available/in process of formulation

Colombia is party to several international and regional conventions and agreements. Table 4 below give an overview of the implementation status of the international and regional agreements and conventions relevant to the oil and gas governance in which Colombia is a States Party.

Table 4: Multilateral Environmental Agreements have been adopted into Colombian laws.

Multilateral Environmental Agreement	Ratification/ Accession	Entry into (international) Force	Adoption into National Laws (Yes/No)
United Nations Framework Convention on Climate Change (UNFCCC) 1992	1994	1994	
Protocol to the United Nations Framework Convention on Climate Change (Kyoto Protocol) 1997	2001	2005	
Paris Climate Accord 2015	2017	2016	
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal 1989	1996	1992	
Convention on Biological Diversity 1992	1994	1992	
Cartagena Protocol on Biosafety to the Convention on Biological Diversity 2000	2002	2003	
Rotterdam Convention on the Prior Informed Consent Procedure 1998	2007	2004	
Stockholm Convention on Persistent Organic Pollutants 2001	2008	2004	
United Nations Convention to Combat Desertification 1994	1998	1996	
Montreal Protocol on Substances that Deplete the Ozone Layer 1987	1992	1989	
Vienna Convention for the Protection of the Ozone Layer 1985	1990	1988	
Convention on International Trade in Endangered Species of Wild Fauna and Flora 1973	1981	1975	
Minamata Convention on Mercury 2013	2018	2017	
International Convention for the Prevention of Pollution from Ships (MARPOL) and Protocols 1973	1981	1983	
Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety 2010	2020	2018	
Convention on the Conservation of Migratory Species of Wild Animals 1979	Not ratified/ acceded	1986	
Ramsar Convention on Wetlands of International Importance 1971	1998	1975	
UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage 1972	1983	1975	
UN Convention on the Law of the Sea 1972	1982	1994	
Prevention of Marine Pollution by Dumping of Wastes and Other Matter	Not ratified/ acceded	1975	
Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972, revised 1996)	Not ratified/ acceded	2006	
International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004	No ratificado / implementado	2017	
Cooperation Protocol to Combat Oil Spills in the Wider Caribbean Region	2001	1986	
Agreement for the Protection and Development of the Marine Environment in the Greater Caribbean Region	1987	1986	
Protocol regarding cooperation to combat hydrocarbon spills in the Greater Caribbean Region 1983	1987	1986	
Agreement on Regional Cooperation to Combat Pollution of the Southeast Pacific by Hydrocarbons and other Noxious Substances in Emergency Cases	1985	1987	
Protocol for the Conservation and Administration of Marine and Coastal Protected Areas of the Southeast Pacific	1996	1995	
International Convention on Civil Liability for Damages Caused by Pollution of Sea Waters by Hydrocarbons	1989	1975	

Legend

Available | Draft status | Available but under review | Not Available/in process of formulation

3. PURPOSE AND OBJECTIVES OF THE CAPACITY NEEDS ASSESSMENT

The purpose of the CNA is to conduct a rapid assessment that maps the capacity needs of key Government Ministries, Departments and Agencies (MDAs) with respect to environmental management in the oil and gas sector. The assessment was not intended to be comprehensive but maintains the aim of simply identifying strategic issues based on a rapid review, hence it is referred to as a 'preliminary' CNA, aimed at a broad-brush look and understanding of emerging/new issues and current challenges related to capacity needs/issues.

The CNA contributes to the development of a national "roadmap" that outlines the strategic capacity needs of Government institutions to strengthen environmental management in the oil and gas sector. This provides a basis for further designing the environmental component of the OfD programme in Colombia and supporting the Government in reaching out to other development partners.

The overall objectives of the CNA are:

1. To prepare a brief and high-level overview of the roles, responsibilities and capacities of key institutions and legal and regulatory frameworks which are relevant for managing environmental issues associated with the oil industry.
2. To identify any obvious gaps with regard to managing the environmental impacts of the oil and gas sector, including with respect to international best practices to deal with the emerging challenges of managing oil and gas exploration and production related to environment.
3. To identify the possible key areas of concern where capacity building efforts might be needed to ensure effective environmental oversight and management of oil and gas exploration and production and tackle current and future challenges.
4. To present the findings to Government and key stakeholders for their review and validation of the identified key concerns.
5. Following feedback from the Government and key stakeholders, to agree on future ways that partners can continue to contribute to supporting capacity needs in this important sector.

4. CAPACITY NEEDS ASSESSMENT METHODOLOGY

Adapting to COVID-19 restrictions, the CNA (and other contributing) components were reduced in their depth of coverage and relied extensively on remote meetings, conference calls and virtual workshops. Annex 1 presents the schedule of interventions, meetings and other events related to the inputs that contributed to this report.

4.1 Desk review

The assessment started with a brief desk review of information on policies, legislation and information relevant to the oil and gas industry and environmental management. This process continued into the final reporting phase.

4.2 Capacity Needs Assessment Questionnaire and Consultations Workshop

As part of the CNA process, UNEP, in collaboration with the Ministry of Environment and Sustainable Development (or Minambiente) undertook various initiatives to gather the information presented in this report.

Capacity Needs Assessment Questionnaire

The CNA Questionnaire, developed for use with other OfD collaborating countries, comprises eight thematic areas, and a total of 105 questions to which a score is attributed and details and elaboration provided where relevant. Designed as an initial rapid assessment technique, the eight themes are:

1. National institutions/institutional capacities related to environment and oil industry
2. National policy/legal/regulatory frameworks/ governance
3. National technical capacities (knowledge and skills) related to environmental management of the oil and gas industry
4. NGO and civil society/citizen participation
5. Academia
6. Print, visual and social media
7. Private sector
8. Disaster management/emergency preparedness and response to oil spills & accidental releases

The CNA questionnaire was first completed based on desk-based findings and from the experienced gained through the preparation visit for the Contaminated Site Assessment course (see 4.3 below). This first draft was shared with a small group of three key informants in May 2020. On 23 June 2020, a virtual workshop was organised to fine tune and validate the answers and scores, the objective being to gather feedback from a wider group of nine government institutions and other stakeholder, including the academy and civil society. The resulting discussions allowed the UNEP team to understand broader issues associated with the sector. Annex 2 provides details of names and institutions of those involved in the CNA questionnaire and validation workshop in June 2020. The outputs from the questionnaire include spider plots of the scores and narrative to accompany some of the questions and themes.

The **draft *Preliminary* CNA** Report developed in January 2021 is annexed to this report (Annex 4), with updates where they have since been developments. This draft initially identified 29 Key Areas of concerns, from 15 distinct categories related to environmental management of the oil and gas sector in Colombia. These concerns formed the basis of the latter validation process held from March to May 2022 and a final review of the draft report in October 2022, which subsequently led to recommendations that can inform future efforts in the sector.

4.3 Contaminated Site Assessment Training Preparation and Online Course

A site visit to Bogota was made between 19–22 November 2019 to initiate contact and meetings with participating institutions supporting the development of the Contaminates Site Assessment (CSA) course, with the initial introductory meeting attended by 12 participants from different institutions. Following the COVID-19 outbreak, the course was adapted and divided into two parts, one as an online workshop, held over three half days between 4–6 November 2020, with the field component to be arranged when conditions permit.

The CSA course was attended by 40 participants (see Annex 2) and provided numerous opportunities for participants to share experiences, knowledge, challenges, and concerns related to oil contaminated sites and the oil and gas sector in general. A training report has been prepared.

4.4 Key Areas of Concern Prioritization Process

In March 2022, through an online workshop the Technical Working Group (TWG) completed a successful first screening of eight key areas of concern for capacity development, derived from the spider plots of the scores (Figure 4). The screening resulted in a revised list of seven key areas of concern that have emerged as potentially the highest priority in terms of the need for capacity development support. In April 2022, the TWG individually undertook a similar prioritization exercise, focused on these revised seven priority themes, as before, selecting from three options: low, medium, and high priority. In addition, for each theme, an option was provided for a short explanation to support choices made to help strengthen the justification for the final high priority areas that are the focus of future efforts on this program. Participation in this online exercise was confidential. The final prioritization process gave precedence to four priority areas (key areas of concern). In May 2022, these four were discussed in bilateral meetings held with representatives of nine institutions to consider recommendations. In October and November 2022, a new revision and the insights from national and foreign experts supported the inclusion of an additional Key Area of concern, broadening the final scope for future capacity development intervention to these five Key Areas of concern.

4.5 Stakeholder Involvement

In total, 84 individuals participated in CNA related activities, including the CSA Course, that included 64 representatives from Government institutions, eight from the private sector (including five from Ecopetrol), ten from academic and two from civil society. The information gathered from the interviews, meetings and questionnaires was reviewed to identify strengths as well as gaps in capacity needs within and across institutions.

5. PRIORITIZATION OF CAPACITY CHALLENGES

5.1 Purpose of prioritization exercise

The purpose of this exercise was to identify priority areas for capacity development commitments and to develop more specific recommendations to address them. The focus was on the 29 Key Issues of concern identified through the initial review and consultations, from the 15 distinct thematic areas (see Annex 4). These concerns formed the basis of the latter validation process, which subsequently led to recommendations in this report that can inform future efforts to strengthen environmental management in the oil and gas sector in Colombia.

5.2 Overview

The scope of the prioritization process included the following steps:

1. **Review the draft *Preliminary* CNA Report** UNEP 2021 (see Annex 4).
2. Identify the highest priority **capacity need areas**, based on the preliminary findings, for further assessment and analysis.
3. Convene one national online **stakeholder consultation to present the CNA draft report** and gain consensus on the top three to four Priority Areas.
4. Conduct additional **bilateral meetings** with selected stakeholders and agree on recommendations to address the Priority Areas.

Stakeholders engaged in the above process were:

- National Government Ministries/ Departments/Agencies
- Local Governments where oil and gas activities are located
- Universities/academia
- Private sector, including national oil companies, EIA practitioners, consulting firms working in the oil and gas sector
- Civil society organizations/NGOs

5.3 Process of prioritization

Following a review of the original 29 Key Issues presented in Annex 4, combined with the outputs from the CNA Questionnaire and resulting matrix spider plots (Figure A1, Annex 4), eight Key Areas of concern for capacity development were identified (see Figure 4).

These eight Key Areas of concern were screened by the TWG and subsequently revised and re-worded to emphasize the inputs from the first screening process and improve the focus. The number was reduced to the following seven Key Areas of Concern (A-G), for re-evaluation:

A. Develop a qualification system for environmental impact study entities.

B. Strengthen national technical capacity (knowledge and skills), also at sub-national level, in relation to environmental impact assessments of the petroleum sector. To focus on unconventional oil and gas ('fracking') industry, offshore exploration and production, 'liabilities' and environmental monitoring considering future developments in the sector.

C. Strengthen capacities and legislation to promote and monitor reduction of greenhouse gas emissions and flaring. Includes establishing a baseline to support the reduction and measurements of greenhouse gas emissions and flaring.

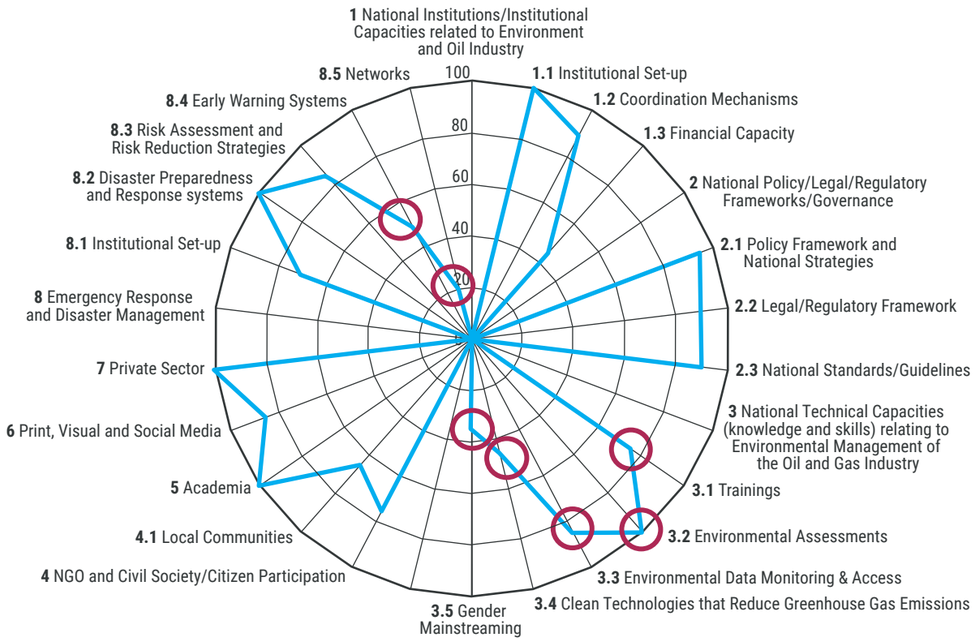
D. Prevention of emergencies/disasters with unconventional oil recovery ('fracking'), offshore exploration and production and pipeline monitoring. Includes attention to associated socio-economic and environmental issues and capacity building.

E. Accredited laboratories needs assessment. Conduct an assessment of capacity building needs in the country related to the accreditation of analytical facilities for monitoring the oil and gas sector considering future developments in the sector.

F. Develop a shared access environmental database, for use in integrated spatial planning and monitoring to address multiple environmental, social and economic interests for oil and gas development, including offshore.

G. Strategic environmental analysis of the oil industry and the energy sector as a whole. This should result in a vision and mapping plan for the oil industry, including defining the most pollution-sensitive geographical areas, and of the offshore side, to guide individual impact studies.

Figure 4. Spider plot of the detailed 2021 CNA questionnaire results showing the eight Key Areas of Concern that emerged as potentially the highest priority for re-evaluation.



5.4 Final Prioritized Areas for Capacity Development

The outcome of the final prioritization exercise in April 2022, through an anonymous online poll, resulted in the four Priority Areas of concern for capacity development being identified. Each section below presents each of the four Priority Areas and a short description on the context as it relates to Colombia, derived mainly from Annex 4, followed by a short section on general recommendations and a focused list for interventions. These recommendations were part of the output of the final stage of the stakeholder bilateral revision meetings which took place in May 2022 involving 21 representatives from nine institutions (see Annex 2).

During October and November 2022 a final revision process was carried out during which the CNA draft was analysed by experts from the Ministry of Environment and Sustainable Development (Minambiente), ANLA, ANH, MME, UNGRD and the International Methane Emissions Observatory (IMEO). The result from these insights and contributions gave way to important updates in certain areas of the report, including the streamlining of Key Areas for interventions, as well as the inclusion of an additional fifth Key Area.

The recommendations below are based on the acquired understanding of the challenges, background and context of oil and gas activity in Colombia by PNUMA consultants during a period of almost 3 years of research. This study has inevitable limitations in time and scope, and it must be understood that situations may change in the short term and, that those who are responsible for the oil sector must always be aware of the need to update and change scope when priority issues arise.

PRIORITY AREA 1

Strengthen national technical capacity (knowledge and skills), also at sub-national level, in relation to strengthening environmental governance and applying environmental management regulations in the petroleum sector to prevent and minimize potential environmental impacts.

Context:

Institutional capacity building involves development of the necessary regulatory framework, infrastructure and manpower, i.e., introduction of new legislation and institutions, together with enhancement of existing ones. Currently, technical capacities are uneven across the autonomous regions of Colombia, and there is overlap of functions/activities between some of these institutions, especially on environmental issues. The long-standing threat of onshore contaminated sites and waste legacy associated with drilling activities and oil pipelines, including orphan or '*pasivo*' incidents caused by third party activities, demands, among other things, the strengthening of technical capacities to address this complex issue.

General recommendations:

National institutional capacity, structures and functions are needed to support and manage the petroleum sector in Colombia at all levels of government, especially in parts of the country where activities are taking or might take place. This requires working with the petroleum operators in a transparent and productive manner to uphold international and industry best practice standards.

Effective coordination of various institutions involved is critical for performance of environmental management, and a key area of cooperation is monitoring and regulation of environmental and socioeconomic impacts.

Aligned with high performance of environmental management is the need to address capacity gaps in ensuring implementation of new regulations related to flaring and venting – including linking to enhanced monitoring and measurements of emissions from the sector, coordination regarding licensing of waste handling by third parties in the private sector; improved harmonization between ANLA and regional corporations on monitoring and control issues; reinjection of produced water and protection of aquifers; and management of produced water in the sea.

Focus areas for intervention

1.1 Formation of technical working groups to solve implementation barriers

Even though Colombia has well-established legal frameworks and policies, implementation is the main challenge. It is necessary to establish technical working groups (TWG) made up of members of relevant institutions that focus on addressing the problems and challenges related to applying existing policies. For instance, although there is a legal framework for hazardous and non-hazardous waste management, the lack of effective waste management has become one of the main aspects in community dissatisfaction, which needs specific action to improve said management and reduce the environmental risk it poses.

TWGs may help generate a network between relevant institutions, especially Minambiente and MME, to participate in initiatives involving environmental aspects of the oil and gas sector. Said groups may help anticipate implementation challenges and contribute to reinforcement of the compliance and monitoring of relevant activities.

TWGs would begin by undertaking a detailed analysis of the areas of overlapping functions, activities and deficiencies in the operational conditions for follow-up and monitoring, for example between ANLA and the regional autonomous corporations, which is often responsible for monitoring the service companies that are in charge of waste disposal in the waste management chain, according to the hydrocarbon sector regulations, as the case may be. TWGs will aim to improve inter-ministerial coordination and clarity in compliance monitoring and addressing other emerging problems or challenges.

TWGs may address the significant obstacles in implementation, such as access to sites (on and offshore) to carry out inspections and compliance monitoring, security issues, lack of technical capacities, lack of specific procedures and mandates, lack of budget/resources, etc. Opportunities can be identified to pool resources and complement expertise. Once the challenges and implementation barriers have been identified, TWG members should formulate concrete and precise proposals to address them. The TWGs would follow a fact-based analysis of challenges leading to agreed solutions and improved implementation.

Initial issues to be addressed are those associated with: a) management of waste (including hazardous waste) from the oil and gas sector, involving the licensing of waste handling by private sector third parties; b) on improving alignment between ANLA and the regional autonomous corporations on issues of monitoring and follow-up, on re-injection of produced water and

surplus gas and protection of aquifers, and c) on the management of produced water on land and at sea where the accounting of the volumes of water produced rest with one institution but the issuance of disposal permits and supervising implementation rests with another entity. Other issues may develop with time and be similarly addressed through the convening of TWG with clear terms of reference.

1.2 Develop stronger capacities among autonomous corporations

It is necessary to strengthen the technical capacities of regional autonomous corporations, so they understand the regulatory instruments applicable to oil and gas operations in their jurisdiction. Depending on the corporations, relevant areas in which capacity development should focus include unconventional oil and gas extraction (fracking), management of '*pasivos*' and the integrity and monitoring of oil pipelines; understanding the important environmental and social aspects related to exploration and development and the tools and techniques used for their monitoring, including site inspections; and training for engaging with communities within areas of influence of oil and gas projects.

Regional autonomous corporations need specific support in terms of developing capacities to fulfil their mandates and actively participate in environmental processes and planning during the lifespan of their projects. This is especially important in coastal areas.

Initial steps would include reviewing and prioritizing which regional autonomous corporations are most in need of support and developing appropriate training packages, including guidelines, specific to their conditions, activities and environment. This intervention will follow closely behind Intervention 1.1 (above) where TWGs are addressing barriers to implementation of existing regulations.

1.3 Improvement of offshore exploration and development activities management

New areas of exploration are being developed in the offshore marine environment, and several exploration blocks in the Caribbean are now witnessing exploration activities, and Pacific Ocean blocks are also being offered for licensing. First, it is necessary to identify where the environmental management needs (geographic and technical) lie, and then address them with on a focus on improvement in capacity and institutional understanding of maritime regulatory compliance; strengthened regulatory instruments (regarding gas emissions, noise, radiation and chemical substances) reinforcing; improvement of coordination between institutions such as ANH, ANLA, MME, and DIMAR; produce guidance on conducting EIAs in the maritime/coastal zone (including the preparation of a concept framework for EIA); strengthen cooperation between research initiatives and academia to ensure monitoring of potential impacts on marine life (with a common methodology); and strategical analysis of the mechanisms for participation and commitment of stakeholders regarding the development of offshore hydrocarbon projects. [See intervention 2.3 for health and safety inspectors and regulatory entities that carry out inspections in the sea]. This intervention will follow closely behind Intervention 1.1 (above) where TWGs are addressing barriers to implementation of existing regulations.

1.4 Laboratories and technical tools

Along the whole value chain, from exploration to production and sale, oil (and gas) may accidentally damage the environment in diverse ways and in different volumes. Air, water and soil analysis is an essential monitoring component that requires certified laboratories to supply precise sample analysis. In Colombia, there is only one certified laboratory in the private sector, in Bogotá, that can handle sampling and environmental analysis for the oil and gas sector in the whole country. It is necessary to establish more accredited laboratories and technical tools for control and follow-up equipped for the environmental monitoring of on and offshore activities related to the petroleum sector. After an assessment of the regional autonomous corporations' needs, it is necessary to identify the geographical zones that need these types of facilities the most and to develop a public/private alliance or another incentive to promote the participation of the private sector.

PRIORITY AREA **2**

Prevention of emergencies/disasters associated with unconventional oil recovery ('fracking'), offshore exploration and production and pipeline monitoring.

Context:

Exploration activities always include elements of risk. Accidents can happen and emergency preparedness and response greatly contribute to mitigating impacts to the environment and personnel. Accidental events leading to large oil spills (on land and at sea) as well as other types of spills e.g., chemical spills, and fires on offshore platforms are known to occur, as are ship collisions at sea and grounding.

Colombia has revised and updated the NCP in 2021, and although the current government's vision is focused more on diversifying energy sources, with a strong focus on renewables, attracting foreign investors through regulations that promote industries such as oil and gas continues, including in offshore areas.

There is currently uncertainty on how fracking will develop in Colombia; risks associated with fracking are still not widely known by entities outside the oil companies. Relic wells with old pipelines may also pose some risks in case of an accident or emergency. There was also a regulatory vacuum on the issue of orphan wells with little direct inspections monitoring acute pollution risks at these sites. However, the MME issued the resolution 402030 of 2022, that establishes the technical requirements for plugging and abandonment of suspended and abandoned wells.

General recommendations:

Institutionalizing and exercising the NCP in a coordinated manner in all relevant areas of potential risk, involving all levels of government and alongside the industry needs to become a regular feature of the NCP. When appropriate, this should be expanded to include neighbouring countries in considering preparedness for transboundary spills especially in the marine environment.

Focus areas for intervention

2.1 Emergency response training

In the context of offshore exploration and potential unconventional oil and gas activities, it is necessary to further enhance the emergency contingency plans for oil spills and other forms of acute pollution. Even though environmental sensitivity mapping efforts are being carried out in Colombia, it is important to support the relevant national and regional autonomous corporations in gaining better understanding of the environmental, social and economic complexities and sensitivities of the sites in their jurisdiction, especially in offshore and coastal areas where new exploration activities are being performed. Environmental sensitivity mapping must be developed so it can be used to inform oil spill/acute contamination preparedness and response strategies and pre-positioning of personnel and equipment. As a component of emergency response, marine and coastal sensitivity maps for oil spills should be developed in a GIS platform and involve relevant regional autonomous corporation authorities and emergency response teams, recognizing that spills may originate from national exploration programmes, or incidents involving oil tankers or other cargo vessels.

It is necessary that regional autonomous corporations perform periodic training courses and exercises for preparation and response to oil spills/acute pollution, and that this training involve all response teams at different levels. Issues related to the management of oil spills, the assessment and cleaning of the coastline and the environmental impact assessment must also be approached as part of the training to mitigate environmental and social impact of emergency response.

2.2 Complete the oil spillage emergency response procedure

Following the recent update to the National Contingency Plan supplied by the Ministry of Environment and Sustainable Development (as Minambiente), the task of implementing the procedure setting out advanced spill response techniques remains to be completed and efforts should be focused on completing that process. This will require resolving coordination and collaboration between different entities involved in monitoring offshore activities to avoid overlapping functions. Periodic assessment of oil spillage risk and other potential emergencies (such as chemical spills, ship collisions and grounding) must be carried out along with training on Net Environmental Benefit Analysis (NEBA) and information technologies and be assessed together with sensitivity maps as part of the continuous updating and training of the National Contingency Plan.

Aligned with the above is the need to develop regulations on the use of dispersants , which typically consist of two parts: a) dispersant product approval regulations that describe which dispersants would be approved for use in domestic waters, and ensure that these products

are effective and of relatively low toxicity compared to the predominant type of oil; and b) dispersant use authorisation regulations that define where and when approved dispersant products, including prior authorisation, can be authorised for use on oil spilled in domestic waters (marine and lacustrine).

2.3 Revision of health and safety policies for offshore activity

It is important to establish a qualified review panel to examine the health and safety regulations applicable to workers and inspectors involved in offshore activities, conducting inspections at sea, including safety inspections of offshore platforms and helicopters, and determine whether there is need for revisions and updates to correspond to the nature of activities currently and likely in future to be taking place offshore Colombia. In so doing, reviewers should also consider how best practice can be more efficiently achieved through the use of easily updated standards and technical guides as opposed to regulations that are often quickly become obsolete.

PRIORITY AREA 3

Develop a share-access environmental database for use in integrated spatial planning and monitoring to address multiple environmental, social, and economic issues in relation to oil and gas development, including offshore areas.

Context:

Both terrestrial and offshore petroleum exploration activities rely on and are exposed to a diverse set of biological, fisheries, oceanographic, climatological, socioeconomic, geological, and other features that can be documented in various ways. It is extremely valuable to have a complete set of up-to-date data on the condition of these natural environments, including on biodiversity and environmental parameters, and that the information be hosted by a digital platform and accessible to all relevant entities.

In Colombia, there are a number of existing databases, hosted by diverse public and private institutions (e.g., INVEMAR portal with ANH, Humboldt Institute, natural sciences departments at national universities, MME's Transparency and Access to Public Information platform, and DIMAR has a tool related to environmental sensitivity maps for hydrocarbon spills to create an index of sensitivity), with many others related to air quality and terrestrial biodiversity. However, so far there is little evidence of an environmental database that can be used to increase the use of spatial data in policy and decision making, nor for the development of national or regional sensitivity atlases, especially to guide offshore exploration activities and for use in the event of an oil spill.

Customizable GIS platforms have been developed to increase use of spatial data in policy and decision making and could be readily deployed in the Colombia context at relatively low cost. However, a long-term strategy to maintain the platform, ensure capacity for its use, and update source datasets needs to be considered. Equally, non-technical barriers to data sharing would also need to be addressed.

The National Contingency Plan needs to consolidate geographic information, general lists, databases, regulations, among others, which can be consolidated in the National Disaster Risk Management Information System (SNIGRD).

General recommendations:

The four important features of environmental datasets are its availability, its accessibility to end users, the capacity of users to work with it, operate and benefit from the information, and the means and mechanisms to update it as new data becomes available. Lately the oil industry has become more pro-active in making available datasets for the public good, by engaging local scientists to help fill data gaps and to contribute to capacity building in this area. Environmental databases that are accessible to multiple users, are important for strengthening ESIA reviews, contribute to environmental and social baseline information, especially if they can share in real time the information generated by the different entities.

Focus areas for intervention

3.1 Developing a shared-access environmental database

Designing a shared-access database is a complex endeavor which requires support from experts. For this to be developed in Colombia, it will be necessary to engage data specialists to design a common data sharing geo-platform that permits existing different data repositories and relevant government institutions to contribute and share their respective data/databases, or at least a mechanism to ensure linkage between the different existing databases. Mechanisms for cross-referencing information from major oil and gas activities (public and private), namely onshore and offshore installations, pipelines and transport routes, methane emissions, and methane data derived from satellites, should be integrated into this platform. The compilation of this broad data array represents the first step in the development of an integrated spatial planning tool, which may be developed for the marine space (maritime spatial planning, or MSP) or for portions or regions of the inland landscape. This management tool is designed to aid and guide development, integrating natural resources, geology, infrastructure, and other aspects to improve the understanding of the space analyzed by stakeholders. Another use of this data array could be to contribute to the development of an SEA (see intervention 4.2).

3.2 Quality assurance and management of a shared-access environmental database

Any platform that is designed to share data must include a mechanism to ensure uniformity of scale in the data being collected, potentially also the use of a standard data collection form which could be integrated at a later stage. Avoidance of duplication and redundancy of data should be part of the quality management goals, as is the role to regularly updated and check data accuracy and establish procedures to ensure the quality of real-time data collected from contributing entities, and to define responsibility for compliance monitoring at local/sub-national level, in the context of the density of expertise at national level.

PRIORITY AREA 4

A strategic environmental analysis of the oil industry resulting in a vision and mapping plan to inform the oil industry, and the energy sector as a whole, including a definition of the geographic areas most sensitive to pollution and, for offshore, to guide individual environmental impact studies.

Context:

Increasingly, SEAs are preferred and prepared by governments to guide the development of oil and gas sector activities, and other sectors, in a format that includes cross-sectoral alignment on diverse development issues. SEAs consider broader social and environmental impacts, which are often excluded from the in-depth analysis of individual project specific EIAs and are generally carried out at a broader scale to assess landscape and seascape level impacts which are direct, indirect and/or cumulative.

The Netherlands Commission on Environmental Assessments (NCEA) has provided capacity development activities to Colombian authorities since 2003 specifically aimed on SEA, through national workshops, involving the World Bank, and focused on subsectors hydrocarbons, mining, energy, agriculture, infrastructure, and transport. DIMAR is also working on marine spatial planning to consider wind energy and establish priorities of activities in the maritime space to reduce possibly conflicting use of the maritime space by the increasing number of resource users (oil and gas, wind, fisheries, tourism, etc.)

Individual, project specific EIAs remain a vital procedure and environmental management tool and the gaps identified in Section 1.2 of Annex 4 and associated recommendations remain pertinent in the effort to continue strengthening the EIA processes in Colombia, especially with respect to the offshore domain.

The Caribbean is a higher priority in terms of interventions due to the increased prospects for oil and gas activities in the region. Marine spatial planning, involving all relevant sectors, would help address some of the implementation challenges related to regulation and institutional coordination.

In the development of an SEA for the oil and gas sector, one of the typical elements included is spatial planning to address potential area-based conflicts across sectors. Such plans require environmental datasets (see Priority Area 3).

Similarly, to assess the sensitivity of the environment to these multiple pressures, sensitivity atlases are commonly used (e.g. TanSEA in Tanzania, ZansSEA in Zanzibar and KenSEA for Kenya).

General recommendations:

A strategic environmental analysis (or assessment) represents a strategic policy tool to guide the development of the oil and gas sector, especially relevant for Colombia in areas where exploration and production has not yet begun or only recently started.

An SEA helps inform environmental, socio-economic, health, safety and security regulations, policy, governance arrangements and decision-making pertaining to the sector, vis a vis other important socio-economic sectors, applicable to terrestrial as well as marine spaces. The geographic coverage can be defined at the national, regional, terrestrial, marine or hydrocarbon basin scale.

A strong evidence-based strategic analysis document will allow more sectors to recognize their own environmental and socioeconomical impacts from a bigger perspective. By demonstrating their potential impacts, they can also strengthen their position within local communities.

Focus areas for intervention

4.1 Developing legislation on sea

Recognising the valuable and important contribution such a tool would have towards improving the environmental management of projects in the sector, a first step is to develop the legal framework to promote and guide SEAs development and guidance that specifically informs on the need, conduct, scope and other parameters for SEAs.

4.2 Defining the scope and developing an assessment process

A key step is to undertake a detailed analysis to determine how an SEA tool would best be applied in Colombia, how it would be enabled and developed with participation of the petroleum sector and the environmental authorities. The geographic scope(s) should be defined, and agreement on how it should be formulated, assessed, and implemented. There is need for an institution to lead the process, be the 'owner' of the initiative, usually attached to a ministry, with a committee to overseas the development of the SEA. The process includes identifying key issues based on risk and opportunity analyses, followed by prioritization based on defined criteria [potential impact (5-10 years), significant impact (long-lasting, irreversible, permanent), geographic are (footprint), magnitude (scope)] and, as a final step, identifying institutional owners in charge of applying recommendations associated to the key issues. Mindful that a nationwide SEA initiative may not be feasible, strategic analyses could be carried out as a pilot exercise in regional autonomous corporations of the country that are more accessible or be basin-focused for the main oil-producing regions. Relevant regional institutions would then be involved in the process.

The efforts would necessitate engaging a specialist to support at the management level from the ANH, MME and environmental entities to plan and develop such assessments, while making resources available for their implementation. The scope(s) should also be relevant for onshore and offshore wind energy, helping to formulate a clearer path towards a sustainable energy transition to renewables, thereby contributing towards compliance of Colombia's national environmental objectives and commitments.

PRIORITY AREA **5**

Strengthening capacities and legislation to promote and monitor reduction of flaring and emission of greenhouse gases.

Context:

At COP26 in November 2021, Colombia joined the Global Methane Pledge and in February 2022 signed a resolution (Resolution 40066/22) to reduce methane in the hydrocarbons sector. UNEP IMEO has conducted various training on methane emissions in Colombia and is willing to conduct more (even in person). In addition, IMEO is also planning a large-scale methane measurement campaign of oil and gas infrastructure in Colombia, led by Carleton University and with support from Ecopetrol that could serve as a baseline emission estimate for the sector. IMEO is also considering expanding the measurement campaign to include all sectors in Colombia to provide a comprehensive baseline.

General recommendations:

There are clear international good practices for managing methane in oil and gas activities. Through OGMP 2.0, IMEO has developed technical guidance documents that help operators to control and measure methane emissions in their source, and member companies share their findings to support transparency towards methane decrease even more.

Focus areas for intervention

5.1 strengthening institutional capacities and coordination regarding the reduction of greenhouse effect gases emissions

Capacities should be strengthened at ANLA and Minambiente on GHG measurement and calculation, and best available mitigation technologies, particularly on methane emissions reduction, to effectively carry out its role in assessing EIAs submitted for approval and issuing environmental licenses. EIAs may be used to establish conditions related to reducing emissions when issuing an environmental license to construct and operate facilities across the oil and gas value chain, including production, processing, transportation, refining, and petrochemicals.

Capacities should be strengthened at ANH and MME on GHG measurement and calculation, and best available mitigation technologies, particularly on methane emissions reduction, to effectively carry out its role in monitoring and inspections of flaring permits awarded to operators.

Similar to the CCAC support being provided to ANH, ANLA too can be equipped with an administrative structure that defines roles for each of the departments involved in the monitoring and compliance functions. Such a structure should also factor in the seat for inter-ministerial coordination between MME and Minambiente to facilitate institutional cooperation across regulatory bodies engaged in the hydrocarbons sector.

Efforts to strengthen national institutional capacities for compliance monitoring by ANH and ANLA should be supported, including conduct of site inspections and audit campaigns related to emissions in the upstream sector.

5.2 Quantification, followup and mitigation of greenhouse gas emissions

To develop tools or methods for quantifying emissions, revision of management measures and other tools for its control to incorporate or update regarding policy instruments. About methane emissions, these methods should follow national policies like OGMP 2.0.

With increased monitoring, there is also a need to have data management systems that can handle the amount of data coming online. The shared access environmental database that has been recommended in this report should also include data on methane emissions from leaks, flaring and venting. The data that IMEO is gathering from OGMP 2.0 member companies (including Ecopetrol), scientific studies (including one in Colombia), and satellites can be important additions to this data.

In addition to its regulations, Colombia may also consider performance-based standards that set broader emissions limits across facilities and industry segments. This may take the form of an emissions reduction target or performance standards. Methane reduction targets should align with what is needed to achieve the Paris Agreement – 45% reduction by 2035 and 60-75% by 2030. IMEO can help companies and governments define targets and determine an emissions baseline and track progress towards goals. Specific offshore environmental regulations on emissions may also be developed.

It is completely feasible today that oil and gas production occur with near-zero methane emissions (intensity below 0.20%); this is much simpler and cheaper when done from the start. Therefore, any new production should be designed with a commitment to achieving this standard.

While quantifying emissions levels for its next national emissions inventory under its UNFCCC obligation, Colombia may consider using the new IPCC emissions factors (with different Global Warming Potential) for the oil and gas sector updated in 2019, instead of the 2006 version that was used in its latest BUR submission in 2022. It is also encouraged that measurement-based emissions factors are used when available. Some operators in Colombia are developing these factors for their activities through the OGMP 2.0. Furthermore, any new framework for GHG should also include emissions from abandoned sites, considering they are one of the main GHG emitters.

Emphasis must be placed in improving effectivity of existing torches. A key intervention will be to promote investment in technology improvement and controlling the efficiency of torches to reduce methane emissions from oil and gas production quickly and profitably. While the standard belief of the industry is that torches work with an efficiency of 98%, a new study (Plant et al., 2022) concludes that, on average, they are closer to 91%, a difference of millions of tons of CO_2e. Improving the efficiency of torches is a fast and cheap way to reduce GHG in Colombia. Flaring and venting might promote a higher harnessing of associated gas and establish a minimum efficiency for flaring or a clear emission reduction goal.

6. CONCLUSIONS AND NEXT STEPS

Over the course of this brief analysis, the CNA initially identified 29 Key Areas of concern, from 15 distinct thematic areas related to environmental management of the oil and gas sector in Colombia. These concerns formed the basis of a detailed validation process, which subsequently led to recommendations and focus areas of interventions that could inform future efforts in the sector.

The five Priority Areas of concern that need to be the focus of capacity strengthening efforts are:

Priority Area 1:
National technical capacity (knowledge and skills), including at the sub-national level, in relation to strengthening environmental governance and management in the petroleum sector to prevent and minimize potential environmental impacts.

Priority Area 2:
Prevention of emergencies/disasters associated with unconventional oil recovery ('fracking'), offshore exploration and production and pipeline monitoring.

Priority Area 3:
Development of a share-access environmental database for use in integrated spatial planning and monitoring to address multiple environmental, social and economic issues in relation to oil and gas development, including offshore.

Priority Area 4:
A strategic environmental analysis of the oil industry which results in a vision and mapping plan to inform the oil industry and the energy sector as a whole, including defining the most pollution-sensitive geographical areas, and of the offshore side, to guide individual impact studies.

Priority Area 5:
Strengthening capacities and legislation to promote and monitor reduction of flaring and emission of greenhouse gases.

On a broader scale, and in light of the likely areas of petroleum exploration activity in the near future in Colombia, with unconventional, offshore and enhanced oil recovery technology (particularly fracking), the most prominent concerns are those associated with environmental and social issues linked to the overall management of the sector. Two themes of prominence are the need for ongoing close monitoring of EIA processes that guide individual programmes, including monitoring of project implementation and decommissioning for onshore fracking and offshore programmes. The second is the need for a Caribbean Sea SEA and/or MSP initiative accompanied by a coastal sensitivity atlas – linked to a comprehensive environmental database – to guide the development of the sector as it expands offshore.

Associated with these two focus areas are institutional capacity strengthening required to allow technical staff to accompany the technological development of the industry and the associated environmental and socio-economic risks. Offshore emergency response is a third and new area that has strongly emerged as another main concern, closely followed by the long-standing threat of onshore contaminated sites and waste legacy associated with drilling activities and oil pipelines, including orphan or 'pasivo' incidents caused by third parties. Responding to these concerns through specialist training would strengthen management and boost confidence at the institutional level and the general public, contributing eventually to the development of appropriate policies and legislation and reduce overall concerns over the future development of the sector.

The few areas where the CNA was less successful in generating sufficient information that still warrants further attention in future are the issue of air emissions/flaring, the relations between national and sub-national governments and the apparent limited capacities at the municipal level, and accreditation of national laboratories for analysis of samples.

The next steps typically would include the following:

1. Disseminate the CNA Report to relevant institutions as well as sub-national Government officials;
2. Review the Key Concerns and reach consensus on which are the most important;
3. Revisit the recommendations within institutions and where necessary with relevant development partners; and
4. Agree on 'owner' institutions to devise the capacity development strategy and plans to implement the recommendations on the five Priority Areas of concern (and others) for strengthening environmental management in the oil and gas sector.

The resulting capacity development strategy and plan for strengthening environmental management in the oil and gas sector can contribute towards strengthening the capacity of the Colombia Government institutions to manage environmental and social aspects related to the oil and gas sector.

Given the possible increase in oil and gas activities in Colombia over the coming decade, especially in newer and more sensitive contexts, in order to continue to operate an effective and sustainable EIA regime that can provide the environmental management framework to address the challenges posed by the oil and gas sector, heightened and sustained political will is necessary. With that in place, it can be expected that ultimately the EIA process and implementation of the recommendation to address the five Priority Areas will help the country meet its sustainable development priorities.

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ANNEXES

Annex 1.
Timeline of the CNA Process

2019	1 November 2019	UN Environment team (Matthew Richmond) begins the draft CNA questionnaire response based on desk-based reviews.
	16–21 November 2019	UN Environment team (Matthew Richmond) arrived Bogota for the preparation of the CSA processes.
2020	20 May 2020	CNA Questionnaire shared with a small group of three key informants in Bogota for comment and discussion.
	23 June 2020	Multi-stakeholder review and completion of the CNA Questionnaire shared with nine key informants.
	4–6 November 2020	Three-day Contaminated Site Assessment theoretical training workshop, attended by eight Government representatives from four institutions and one representative from the Oil for Development Programme.
	30 November 2020	Completed draft *Preliminary CNA* Report.
2021	January 2021	Electronic copy of the draft *Preliminary CNA* Report shared with focal point for initial comment and definition of validation process.
2022	March 2022	Workshop poll.
	April 2022	Anonymous online poll.
	May 2022	Bilateral Meetings.
	Last steps: November – December 2022	Validation process.
		Minambiente CNA Final Report draft presented for revision and translation.
		CNA Report update – Follow-up consultation for information gaps.
		Final approval of the CNA Report by Minambiente.

Annex 2.
List of participants and institutions met

Means of Engagement Legend: INT = Introductory meeting in Bogota, Nov. 2019; CN = CNA Questionnaire Jun 2020; CSA = CS Course, Nov. 2020; WSP = Workshop Poll, Mar. 2022; OLP = Online Poll, Apr. 2022; BMG = Bilateral Meetings, May 2022. FIN = Final review rounds, Oct – Dec 2022.

		Means of Engagement					
Institution	**Participants**	**RIB**	**ENC**	**ESC**	**TDE**	**RBL**	**FIN**
CENTRAL GOVERNMENT							
ANH	Eduardo Rodriguez	■					
	Santiago Román	■					
	Guillermo Acevedo	■	■	■			
	Mariana Estrada	■					
	Maria Iaza	■					
	Sandra M Luna	■					
	Ramiro Jaimes	■		■			
	Nelson Manrrique	■					
	Helman Alberto Bermudez			■	■	■	■
	Hugo Buitrago			■			
	John Escobar				■		
	Diana Martinez				■	■	
	Giovanny Molina Londono				■	■	■
	Anelfi Balaguera Carrillo						■
UNGRD	Nelson Hernandez		■		■	■	
	Jorge Enrique Gómez Florido				■	■	■
	Yinneth Cumplido Botello			■			
ANLA	Nestor Fabio Garcia Merlano			■			
	Ana Katherine Arteta		■				
	Juan Alais Osorio Santana			■			
	Nelson Arturo M. Rodriguez	■		■			
	Jorge Andres Romero Martinez				■	■	■
	David Rauchwerger Celis				■	■	■
	Laura Constanza Hernández Ras				■		■
	Diego Martínez				■		
	Diego Armando Ruiz Rojas				■	■	■
DIMAR	Eduardo Santos	■					■
	Libardo Rodriguez					■	■
	Juan Lopez					■	■

Institution	Participants	Means of Engagement RIB	ENC	ESC	TDE	RBL	FIN
Minambiente	Ernesto Romero Tobon			■	■	■	■
	Jesus Miguel Sepulveda Escobar				■	■	■
	Alma Isbel Ariza Ramirez				■	■	■
	Magdalit Holguin	■	■	■	■	■	
	Astrid Reyes	■		■			
	Luisa Fernanda Carvajal	■					
	Olga Lucia Gomez Cená	■					
	Karen Viviana Lopez Aguilar			■			■
	Ana Maria Gonzalez						■
Ministerio de Minas y Energía (MME)	Sofia Roa Lozano			■			
	Luis Fabían Ocampo			■			
	Laura Paola Rincon González			■	■		
	Oscar Iván Suárez Murcia			■	■		■
INVEMAR	Julián Mauricio Betancourt					■	
Ministerio de Trabajo	Daniela Aragon Salleg					■	
	Luz Cecilia Garcia Perez					■	■
	Oscar Ernesto Amaris Montero					■	■
	Fabio de Jesus E. Vargas Poveda					■	■
	Jorge Enrique Fernandez Vargas					■	
REGIONAL GOVERNMENT							
CARSUCRE	Brenda Chamorro			■			
	Tulio Ruíz			■			
CAS	Luis Fernando Velasco Martínez			■			
	Sabina Amaris			■			
	Xavier Antonio Palacio.			■			
CORMACARENA	Jania Andreyina Bonilla Moreno			■			
	Juan Carlos Sanchez Medina			■			
CORPOAMAZONIA	Yanina Andrea G. Mutumbajoy			■			
CORPOBOYACA	Erwin Ferney Córdoba Velosa			■			
	Edwin Harvey Toro León			■			
CORPONARIÑO	Fernando Paredes Coral			■			
	William Preciado Ángulo			■			
CORPONOR	Cesar Augusto Ortega Ortega			■			
	Hoswart Cristancho			■			
	Leidy Jhoanna Perez Castro			■			
CORPORINOQUIA	Martha Liliana Báez Diaz			■			

Institution	Participants	Means of Engagement RIB	ENC	ESC	TDE	RBL	FIN
PRIVATE SECTOR							
ECOPETROL	Sandra Janeth Pérez Gallardo			■			
	Miguel Angel Cortes			■			
	Judy Pedreros	■					
	Vera Navaro Santa	■					
	Juliana Giraldo	■					
UT IJP	Gabriel Riaño	■					
Independiente	Laura Hernández		■				
Independiente	Ana Yamile Correa	■	■				
ACADEMIA							
Uni. Nacional de Colombia	Leonardo Donado	■	■	■		■	■
	Diego Cortés			■			
	Adriana Piña Fulano			■			
	Maria Jose Martinez Cordón	■					
	Carlos E Gonzalez	■					
	Camillo A Cortés	■					
Uni. Industrial de Santander	Dionisio Laverde	■	■				
	John Freddy Palacios			■			
ICP	Darwin Edgardo Velandia Castro			■			
	Marlon Serrano Gomez			■			
CIVIL SOCIETY							
ACGGP	Flover Rodríguez-Portillo		■	■			■
	Juan Pablo Ramos			■			
UNITED NATIONS ENVIRONMENT PROGRAMME							
IMEO, Paris	Meghan Demeter						■
PNUMA Colombia	Mauricio Bedoya	■	■	■	■	■	■
	Cristian Rojas Cifuentes		■	■			
	Juliana Ibarra Yomayusa		■	■			
UNEP Disasters & Conflicts	Devashree Pillai		■	■	■	■	■
	Matthew Richmond		■	■	■	■	■
	Marisol Estrela		■	■	■		■
UNEP consultant	Olof Linden		■	■			
UNEP consultant	Geraint Williams		■	■			

Annex 3.
Questionnaire for Analysis of Prioritized Areas for Capacity Development

The set of questions below are intended to guide the initial analysis of the prioritized areas of concerns related to capacity needs for Colombia. The purpose of these bilateral consultations with stakeholders is to gain understanding and triangulate stakeholder perspectives on the following areas:

- Key issues, including present and emerging/future concerns, within the prioritized areas
- Current efforts by the respective institutions to address these key issues/challenges
- Other current efforts in the country to address these key issues/challenges
- Gaps/challenges in addressing identified issues
- Opportunities/recommendations for addressing identified issues
- Other key stakeholders who should be involved (consider gender representation, potential conflict sensitivities, local/private sector/non-government actors)

Understanding the scope of the problem:

1. Within this identified priority of concern, what are the most important aspects that warrant further attention?
2. How do you perceive the geographic scope of this concern across Colombia, from central government to the 32 departments?
3. How do you perceive the temporal (e.g., seasonal, future/emerging) scope of this concern?

Understanding the institution's role in addressing the problem, what efforts are underway:

4. Who is most impacted by these issues?
5. What is the role and/or mandate (e.g., in a formal policy document) of your institution to address this concern?
6. What is the responsibility of your institution to address this concern?
7. Within your institution how significant is this concern?
8. What current efforts are underway in your institution to address this concern?
9. What other efforts do you know of outside your institution to address this concern?

Gaps and way forward:

10. What are the gaps and/or limitations in efforts to address this concern?
11. What is needed to address these gaps?
12. Which institution(s) do you consider to be most responsible for addressing this concern?
13. Which other stakeholders should be involved in addressing this concern?
14. What is your recommendation on how to address the concern?

Annex: Focus areas of prioritized concerns:

I. Strengthen **national technical capacity** (knowledge and skills), also at sub-national level, in relation to strengthening environmental governance and management in the petroleum sector to prevent and minimize potential environmental impacts. To discuss environmental governance and management issues related to unconventional oil and gas ('fracking') industry, offshore exploration and production, 'liabilities' and environmental monitoring considering future planned developments in the sector.

II. Prevention of **emergencies/disasters** associated with unconventional oil recovery ('fracking'), offshore exploration and production and pipeline monitoring. Includes attention to associated socio-economic and environmental issues and capacity building

III. Develop a **share-access environmental database**. For use in integrated spatial planning and monitoring to address multiple environmental, social and economic issues in relation to oil and gas development, including offshore.

IV. **Strategic environmental analysis** of the oil industry. This should result in a vision and mapping plan to inform the oil industry, including defining the most pollution-sensitive geographical areas, and of the offshore side, to guide individual impact studies.

Meeting Schedule

Date	Institution
16 May 2022	Autoridad Nacional de Licencias Ambientales (ANLA)
	Agencia Nacional de Hidrocarburos (ANH)
17 May 2022	Ministerio de Minas y Energía (MME)
18 May 2022	Instituto de Investigaciones Marinas y Costeras de Colombia (INVEMAR)
	Unidad Nacional para la Gestión del Riesgo de Desastres (UNGRD)
19 May 2022	Ministerio de Ambiente y Desarrollo Sostenible (Minambiente)
20 May 2022	Universidad Nacional de Colombia
	Ministerio de Trabajo
23 May 2022	Dirección General Marítima (DIMAR)

Annex 4.
Key Findings and Results of the Preliminary CNA Report

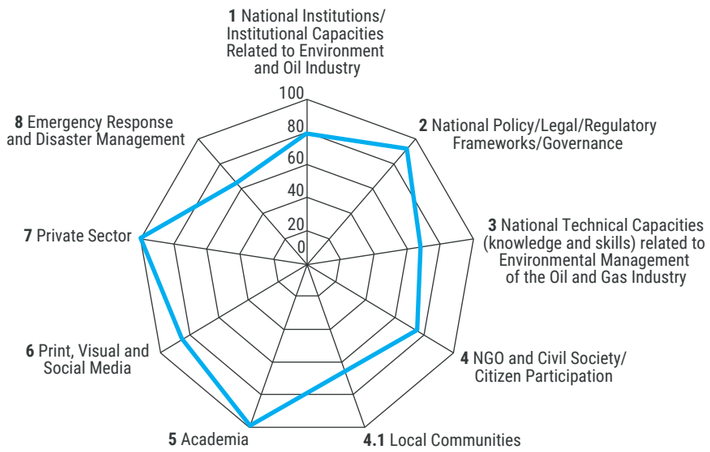
The findings are organized under nine thematic headings, comprising the eight questionnaire headings plus one other comprising new or emerging issues. These are accompanied by the main recommendations to address the identified challenges.

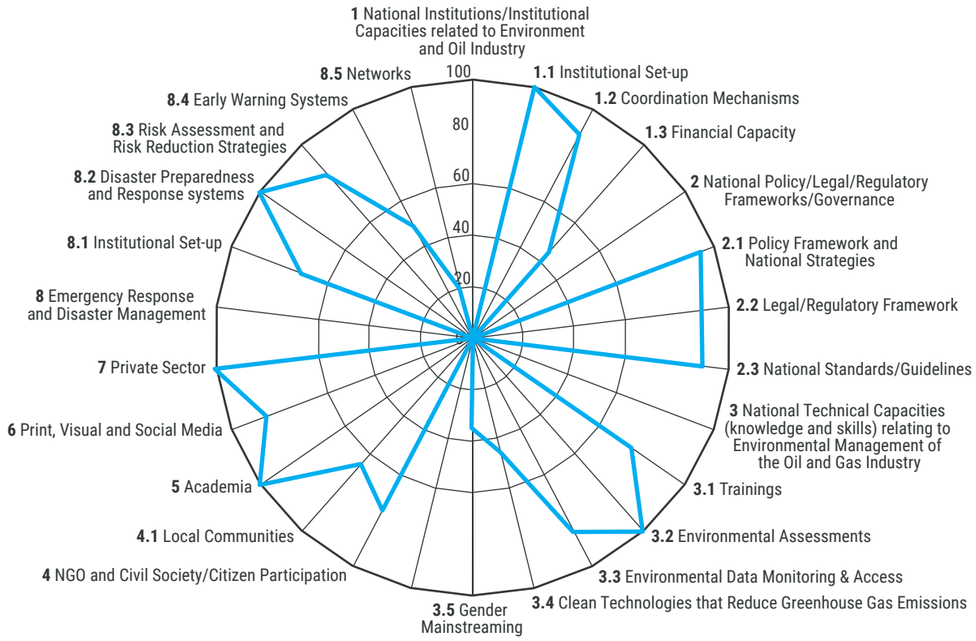
1. Results from the Capacity Needs Assessment Questionnaire

As can be seen from examining the spider plots in Figure A1, the CNA Questionnaire demonstrates clearly that in general, Colombia has in place the institutional and legislative infrastructure to manage environmental issues associated with the oil and gas sector. This is not surprising given Colombia's one hundred years plus of experience in this industry, the high levels of academic training and technical expertise in the country, and the awareness of environment and its sensitivities.

However, some specific areas emerge from the analysis that appear to require more attention. These are described in more detail in the sections that follow, based on the thematic areas and sub-categories of the questionnaire that yielded the weaker scores. Mindful that the above brief analyses are based on the initial set of consultations with limited number of representatives (from academic, private sector, ANH, Minambiente, ANLA and UNGRD institutions), the analysis nevertheless serves as an important basis from which to further investigate weaknesses and identify concerns or omissions in the national capacity to manage environmental issues related to the oil and gas sector in Colombia. To that end, a summary of the questionnaire results is supplemented with the preliminary desk-based findings. The later part also presents the desk-based findings on themes not captured in the questionnaire but raised as concerns through the various exchanges during preparation and execution of part of the CSA training course. For each category, the 'key concerns identified' are briefly described.

Figure A1. Spider plots of the CNA questionnaire: summary (upper) and detailed results (lower).





1.1 National institutions and capacities related to environment and oil industry

Within this portion of the questionnaire the overall score of 80 % suggests national institutions do have the capacity to address environmental issues related to the oil and gas sector. The three possible areas of weakness that emerged were all related to the sub-category of financial capacity: a) whether environmental institutions have access to equipment (laboratories, computers, vehicles) to undertake field sampling and analysis; b) the existence of a fund or budget to support inter-ministerial coordination related to environmental issues; and c) if the Minambiente and relevant ministries have adequate budgets to implement the environmental compliance monitoring plans.

When assessing the institutional architecture, UNEP concluded that there is a strong institutional framework in Colombia to address issues relating to environmental management in the oil and gas sector, as confirmed by the CNA Questionnaire. Based on those findings and the review, the institutional setup and communication between relevant entities are well-established and functioning. Nevertheless, some concerns exist.

Key concern 1:
Financial means to equip and operate the responsible entities to analyze data submitted by the operators.

Key concern 2:
Adequate budgets for inter-ministerial coordination mechanisms.

Key concern 3:
Adequate budgets to implement environmental compliance monitoring.

There are two principal ministries that cover the bulk of the main environment issues associated with the sector, the Ministry of Mines and Energy, and that of the Environment, both briefly described below.

Ministerio de Minas y Energía (MME)

The MME is responsible for promoting and developing Colombia's energy resources. It is a major authority in the Central Government and reports directly to the President. It is the responsible body for directing national policy for mining, hydrocarbons, and energy infrastructure in Colombia. It is also responsible for managing the country's non-renewable resources (USAID, 2014).

Six major agencies and institutions fall under the authority of the MME:

- The Mining and Energy Planning Unit (UPME). Founded in 1992, the UPME is the planning authority responsible for determining energy needs and ways to satisfy domestic demand.
- The Energy and Gas Regulatory Commission (CREG). Established in 1994 to replace the Commission of Energy Regulation, the CREG has the mission of ensuring an efficient and timely supply of electricity and gas services, in terms of quality and cost.
- The Planning and Promotion Institute for Energy Solutions to non-interconnected zones (IPSE). Established in 1999, IPSE aims at promoting and implementing energy projects in areas where the national grid does not provide energy (mostly rural areas).
- The ANH is the national oil agency, a technical branch dealing with the oil and gas sector.
- The National Mining Agency (ANM)
- The Colombian Geological Service (SGC). Responsible for research on potential of geological resources, including hydrocarbons and reporting to the UPME

Ministry of the Environment and Sustainable Development (Minambiente)

The main function of the Minambiente is to guide and regulate the environmental management of the territory and to define the policies and regulations to which the recovery, conservation, protection, management, use and sustainable exploitation of renewable natural resources. Minambiente defines the criteria and methodologies for assessing and monitoring the environmental impacts of production and service activities. The Minambiente has the most important role in supporting environmental management in the oil and gas sector. It is also important to note that the project monitoring system is carried out by project managers and at their expense.

One of Minambiente' functions is to design and promote, within the productive and service sectors (in this case, oil and gas), strategies for adoption of better environmental practices aimed at improving competitiveness, productivity, self-management and internalization of environmental costs, as well as technical instruments for implementation of environmental policies in the productive and service sectors; based on systematic assessments of national capacities. The following are the principal institutions involved with environmental aspects of upstream oil and gas activities in Colombia:

- **Dirección de Asuntos Ambientales, Sectorial y Urbana**, within the Minambiente
- **Autoridad Nacional de Licencias Ambientales** (ANLA) is the national environmental licensing authority and is in charge of assessing, securing and overseeing oil and gas projects in the country.
- **Dirección General Marítima** (DIMAR) has the mission to exercise authority over the entire 2900km of coastline (Pacific and Caribbean) and the maritime territory, directing, coordinating, and controlling maritime, fluvial, and coastal activities with integral security and service vocation, with the purpose of contributing to the development of the maritime and fluvial interests of the nation.
- **Instituto de Investigaciones Marinas y Costeras** (INVEMAR), is the national marine research institution, tasked with carrying out basic and applied research on renewable natural resources and the environment in coastal, marine and oceanic ecosystems of national interest.
- **Unidad Nacional para la Gestión del Riesgo de Desastres** (UNDGR) the national institution that deals with risk management and disasters in the country, a key actor, responsible after spills.
- **Ministry of Labour**
- **Sub-national Governments**: there are several environmental authorities who would supply representatives, as would some municipalities.
- **Humbolt Institute**: created by the Government but acts as an NGO; also gets involved in oil spills.

1.2 National policy/legal/regulatory frameworks/governance

General

The current status of Colombia's legal provisions compared to a checklist of legislative and regulatory tools which UNEP developed to assess environmental governance in the upstream oil and gas sector based on international best practice reveals an almost comprehensive coverage across almost all relevant key areas of concern in relation to oil and gas development (Chapter 2). There are five significant omissions regarding produced water, waste management in the oil sector, dispersant use, regulation on dumping in the sea, and strategic environmental assessment policies. On dispersant use, regulations are expected to be included in the NCP, and a document that defines institutional coordination is under preparation.
As recommended by IPIECA (2015), the use of dispersants is an established and proven technique that forms part of the set of response tools and can make an important contribution to minimizing the ecological and socioeconomic impacts of marine oil spills. Countries should develop regulations on dispersant use, which generally consist of two parts: a) a policy for approving dispersant products that describes which dispersants would be approved for use in national waters, and that guarantees that these products are effective and of relatively low toxicity in comparison to the predominant type of oil; and b) a policy for authorization of dispersant use that defines where and when the use of this products is authorized in case of spillage in national waters (lake and sea).

Colombia is also party to several international and regional conventions and agreements relevant to the oil and gas governance with only three major omissions: the adoption into law of the requirements of the Convention of Migratory Species, on the protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, and the requirements of the International Convention for the Control and Management of Ships' Ballast Water and Sediments.

The overall CNA Questionnaire score for this category of 90 % demonstrates adequate coverage of legal instruments to address environmental issues in the sector. The only sub-category that warranted attention was on the presence of standard operating procedures within government to deal with non-compliance by oil/gas industries and whether these have been operationalized.

In relation to the management of produced water from oil production and waste streams, it is observed that oil production generates 12-14 barrels of wastewater for each oil barrel, an amount of waste that requires specific waste management procedures. As for the management of hazardous and non-hazardous waste generated by the sector, this is been insufficient, failing to address one of the main problems of dissatisfaction in the affected communities, and requires specific actions to improve management and reduce environmental problems or risks that generates. The legal framework for these two oil production waste streams needs to be strengthened with respect to regulation, management and participation by the oil and gas sector.

According to the Colombian Constitution, all natural hydrocarbons reservoirs in existence within the Colombian territory, including those inside national boundaries and under the territorial seabed, the continental platform and within the exclusive economic zone (EEZ), are property of the Colombian state. These reservoirs are considered public domain assets and, therefore, are inalienable.

Of note is that gas regulation is separated in a significant manner from oil regulations. Considering the technical definitions, gas regulations encompass aspects ranging from contractual relations, technical standards, transport conditions, sale terms, distribution, consumption and heads of power to further regulate such matters (Lugo and Ricciulli, 2019). The Commission on Regulation of Energy and Gas (CREG) is the principal governmental entity that regulates these aspects.
Gas is considered directly linked to public utilities and fundamental constitutional rights. The belief that gas belongs to a more local market has led to this separate set of rules (Lugo and Ricciulli, 2019).

With regards to environmental law, Colombia became one of the first Latin American countries to implement an environmental legislation framework related to the petroleum industry. The Constitution of 1991 has entire chapters regarding environmental and natural resources protection. Article 80 statutes that the State shall plan the natural resources' management and exploitation, to guarantee its sustainable development, conservation, restoration or substitution. The Constitution also grants the Prosecutor-General the authority to defend collective rights, including the right to a healthy environment. After the Earth Summit in Rio de Janeiro in 1992, the Ministry of Environment of Colombia was created in 1993. The same legislation also established the Environmental Impact Assessments (EIAs) as the basic tool for environmental planning and decision-making in Colombia.

Key concern 4:
The apparent lack of legal basis for the implementation of Strategic Environmental Assessments (SEAs).

While EIAs identify the key environmental issues associated with proposed oil and gas activities, they are generally limited to the technical and operational issues at the project level. Increasingly, Strategic Environmental Assessments (SEAs) are preferred and prepared by governments to guide the development of oil and gas sector activities, and other sectors, in a format that includes cross-sectoral alignment on diverse development issues. SEAs consider broader social and environmental impacts, which are often excluded from the in-depth analysis of individual project-specific EIAs and are generally carried out at a broader scale to assess landscape and seascape level impacts which are direct, indirect and/or cumulative. SEA conclusions are especially relevant to guide maritime spatial planning (MSP), since the allow to understand environmental limitations that complement MSP process, particularly in relation with cumulative impact.

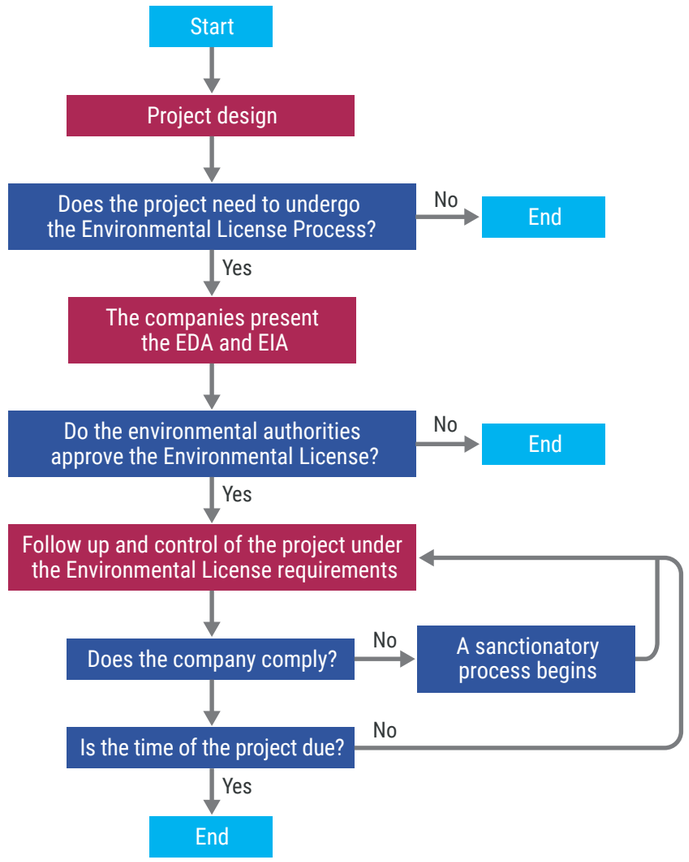
In Colombia, there is currently no legal requirement for SEA within the environmental or sectoral laws, although the Minambiente promotes the inclusion of SEA as a strategy to incorporate the environmental dimension in the sectoral or territorial planning process. Currently, sectors elaborate SEA voluntarily, with the help of the Minambiente (NCEA, 2019). There are no regulations that require SEA for policies, plans and programs nor official procedures, scope and competences for SEA institutions. In 2006, general guidelines for the formulation of SEAs of plans and programs of the agricultural sector (ten in total) were defined. The National Development Plan of 2010-2014 also followed the guidelines provided in the National Development Plan of 2002-2006. Since 2006 the SEA system in Colombia has been continuously further developed through workshops, events, publications etc. By 2019, 20 SEAs have been completed (Jaramillo, 2018). The Mining Law No. 1382 stipules in Article 40: The National Mining Management Plan (NMMP), prepared by the Ministry of Mining and Energy must coordinate with the Minambiente, given the effects on the environment, the location of the population and environmental land use possibilities. This NMMP is designed with a broad vision that goes beyond spatial considerations and aims to integrate the General Land Management Policy (currently under construction) and overcome barriers of interagency coordination, impediments of structure and industry regulations and information sharing, hindrance of human capital and innovation that the mining industry currently faces in Colombia (DG, Mining and Energy Planning Unit, MME).

Environmental Impact Assessments

The Ministry for the Environment is responsible for overseeing the EIA system in Colombia, as outlined in Figure A2, and detailed in Box 1. The law specifies which are the cases that require an environmental license by ANLA, the government institution responsible for granting or rejecting applications for environmental licenses for projects that have a great impact on natural resources and the landscape.

Hydrocarbons firms in Colombia are required to submit an EIA to obtain the mandatory environmental license to start their exploratory and/or producing activities. Environmental permits are mostly issued by regional authorities. Between 1994 to 1999, the Ministry of Environment received 1,535 environmental statements, of which almost half were related to the hydrocarbon sector. During that five-year period, probably 50 to 100 wells were drilled each year, approved through EIA carried out by interest areas which include clusters of wells for entire exploration blocks, including seismic surveys and pipeline installation, or other configuration of upstream exploration.

Figure A2. The EIA Process in Colombia
(Source: Carrero (2019) based on Official Journal of the Colombian Government (2014)



Box 1. Overview of the steps in EIA process in Colombia

EIA Law: Law 99 of 1993 as amended by Law 1753 of 2015 (National Development Plan 2014-2018)

EIA Regulations: Decree 2041 of 2014

Projects Requiring EIA: Government projects and Private Projects

Abridged Assessments: No

Best Practices in Lieu of EIA: No

Who Conducts Screening: Government.
Who Conducts Screening Detail: Decree 2041 of 2014, Art. 23

Criteria for Screening: List or appendix of project or activity types; Proposed project or activity may cause significant environmental impact

Criteria for Screening Detail: Only projects, works and activities that are listed in articles 8 and 9 of Decree 2041 will be subject to environmental license procedure.
Decree 2041, Art. 7

Who Prepares EIA: Project Proponent (with or without contractor)

Who Pays for EIA: Project Proponent

EIA Contractor Qualifications: Yes.
Art. 224 of the National Development Plan (Act 1450 of 2011) requires the national government to establish qualifications for persons or corporations that produce environmental impact studies, environmental assessments of alternatives, and environmental management plans. The qualification and registration system has not yet been implemented, however.

Terms of Reference: Yes.
The ToRs are general guidelines that the environmental authority establishes for the preparation and execution of the environmental studies. Law 1753, Art. 178; Decree 2041, Art.

Days for Decision Maker Review: 90 days

Automatic Approval: No

Written Decision: Yes.
Written Decision Detail: Issuance of an environmental license is an administrative act; therefore, it must be in writing.

Authority to Impose Conditions: Yes.
Decree 2041 of 2014, Art. 28(6)

Expiry of Decision: Indefinite.
"The environmental permit is granted for the life of the project, work or activity and covering all phases of construction, installation, operation, maintenance, decommissioning, final restoration, abandonment and/or termination."
Decree 2041 of 2014, Art. 6

Authority to Impose Conditions: Yes.
Decree 2041 of 2014, Art. 28(6)

Financial Assurances or Bond: Sometime.
Financial assurances are mandatory for all human activities that can cause damage to the environment and that require environmental license, according to the law and the regulations. In practice, however, the law is not implemented well.
Law 491 of 1999, Art. 3.

Interdisciplinary Team: Yes.
In practice, EIA documents are prepared by an interdisciplinary team though not specifically required by the EIA law and regulations.

Range of Alternatives: Yes.
The Environmental Assessment of Alternatives (DAA) "aims to provide information to evaluate and compare the various options presented by the proponent, under which it is possible to develop a project, work or activity. Different options should take into account the geographical, the biotic, abiotic and socioeconomic, comparative analysis of the effects and risks inherent in the work or activity, as well as possible solutions and control and mitigation measures for each of the alternatives."
Decree 2041 of 2014, Art. 17.

No Action Alternative: No

No Action Alternative Detail: Evaluation of a no action alternative is not discussed in the law.

Type(s) of Impact Analysis: Direct environmental impacts, Social impacts, Cultural impacts, Health impacts, Economic impacts

Mitigation: Yes.
Mitigation Detail: Decree 2041 of 2014, Art. 21

Monitoring Plans: Yes.
Monitoring Plans Detail: Decree 2041 of 2014, Art. 21

Public Notice of Draft EIA: No

Draft EIA Available: No

Draft EIA Locations: Not available

Public Notice of Final EIA: Yes

Public Notice of Final EIA Detail: Upon receiving an application for an environmental license and EIA, the environmental authority must immediately publish notice in the bulletin.
Decree 2041 of 2014, Art. 25

Draft EIA Available: No

Final EIA Available: Yes

Final EIA Locations: Internet, Agency or ministry office, Local government office, Other

Fee to View EIA Documents: No

Fee to Obtain EIA Documents: No

Availability of Reference Studies: Yes.
Reference studies and supporting document may be requested based on the right of access to information that is enshrined in the Constitution. In addition Art. 49 of Decree 2041 states that the Institute of Hydrology, Meteorology and Environmental Studies (IDEAM), shall make available environmental information for decision making that has been generated as part of the studies and the monitoring and evaluation activities within the environmental licensing process. Environmental authorities should periodically provide information on the matter received or generated by themselves, according to the guidelines established by IDEAM.

Public Notice of Final Decision: Yes.
The notice is published in the environmental gazette, plus the official journal. In addition, the decision is disclosed to stakeholders, such as the project developer, the Regional Autonomous Corporations, local municipal or regional community leaders, parties involved, among others that have requested notification of events. Law 99, Art. 71.

Public Scoping: Yes.
There is a scoping process, but it is limited because the authority is primarily responsible for determining the scope of the EIA. See Decree 2041 of 2014, Art. 15

Public Review of TOR: Yes.
Although the law does not clearly state that the public may have an opportunity to review the terms of reference, a favorable interpretation of Art. 15 of Decree 2041 of 2014 indicates that it is possible.

Public Participation Opportunities: Scoping, Terms of reference, Public Meetings and/or public hearings, Review of final EIA

Public Meetings: Yes.
Under Art. 5 of Decree 330 of 2007, the environmental public hearing may be requested by "the Attorney General's Office or the Delegate for Agricultural and Environmental Affairs, the Ombudsman, the Minister of Environment, Housing and Territorial Development , the CEOs of the other environmental authorities, governors, mayors, or at least one hundred (100) persons or three (3) non-profit entities. " Decree 330 of 2007, Art. 5. See also Art. 72 of Act 99 of 1993.

Public Input at Meeting: Yes.
Members of the public may participate at the hearing with prior registration. Decree 330 of 2007, Art. 12

Criteria to Hold Public Meeting: Members of the public must request a meeting and/or hearing; The proposed project exceeds a certain size and or cost

Days for Public to Review Draft EIA: Not specified

Days for Public to Review Final EIA: Not specified

Public Comments on Draft EIA: No

Public Comments on Final EIA: Yes

Public Comments on Final EIA Detail: Decree 330 of 2007

Response to Public Comments: Yes.
Opinions, information and documents received at the public hearing are to be taken into account by the competent environmental authority when making decisions.
Decree 330 of 2007, Art. 2

Facilitation of Public Participation: Yes.
Art. 15 of Decree 2041 of 2014 specifically requires the prior consultation of indigenous and Afro-descendant people. Rules and case law have long recognized the right of participation of these communities and peoples.

Citizen Administrative Review: Yes.
Ordinary administrative remedies are available.
Decree 2041 of 2014, Art. 25

Citizen Judicial Review: Yes.
The nullity action proceeds against the administrative acts by means of which a permit, authorization, concession or environmental license of an activity that affects or can affect the environment is issued, modified or canceled. Law 99, Art. 73. There are also popular actions and protection actions that are available to protect the environment.
Law 9 of 1989, Art. 8.

Project Monitoring: Yes.
The project proponent must comply with the environmental management plan. Decree 2041 of 2014, Art. 40. "Los proyectos, obras o actividades sujetos a licencia ambiental o plan de manejo ambiental, serán objeto de control y seguimiento por parte de las autoridades ambientales."

Enforceability of EIA: Yes.
Enforceability of EIA Detail: Popular actions and protection actions that are available to protect the environment may be invoked to enforce the EIA. Law 9 of 1989, Art. 8.

Enforceability of Permit: Yes.
The nullity action proceeds against the administrative acts by means of which a permit, authorization, concession or environmental license of an activity that affects or can affect the environment is issued, modified or canceled. Law 99, Art. 73. There are also popular actions and protection actions that are available to protect the environment.
Art. 8, Law 9 of 1989.

Source URL: https://elaw.org/eialaw/colombia Modified: June 8th, 2020

The study by Toro *et al*. (2009) evaluated the EIA system in Colombia by using a series of criteria based on Principles of EIA Best Practice. The results highlight both its strengths and weaknesses, from where it is concluded that the mere existence of a body of legislation as well as an administrative framework, one of the undeniable strong points of the EIA system in Colombia, is not sufficient in itself to make the system effective.

Based on the findings and the review, three concerns arose related to the EIA process in Colombia.

Key concern 5:
Uncertainties over the existence of operating procedures to address non-compliance by operators issued with environmental licenses based on the approved environmental impact assessment (EIA) and whether they have been operationalized. Note: in final revisions, it was confirmed that there are indeed environmental control procedures and that sanctions are imposed upon companies that are responsible for non-compliance of any environmental obligation.

Key concern 6:
To Determine whether the best-practice procedure of environmental audits was being practiced after project completion.

Key concern 7:
The period for sharing the final EIA with the public for their review is not specified.

Problems arise due to the limited scope of legal measures and administrative support. Other weaknesses reside in the procedures for the design and implementation of EIAs as well as the follow-up and control mechanisms. It is argued that this situation is adversely affecting the environment, which should be protected because of its fragility, biological richness and high number of endemic species. As a result, many of the productive sectors in the country are exempt from the EIA process, and public and private companies show very little social and environmental responsibility, and do not voluntarily participate in EIAs (Carrero, 2019; Toro *et al*., 2010).

The more recent review by Carrero (2019) examined four main aspects of the environmental license process in Colombia: the structures of the process, the environmental impact assessment process, the decision-making process, and the practitioners' compliance with their responsibilities. One finding is that there is a need for more transparent accountability. However, it is confirmed by ANLA that in the environmental monitoring work they carry out, there are procedures for verification of compliance, with teams of professionals from multiple disciplines that carry out this work. In the monitoring work, requirements are formulated if any non-compliance or lack of compliance with environmental obligations is observed, and if this is the case, sanctions are imposed on companies.

Other findings include that the letter of the law is being prioritized over the spirit of the law, how public participation is currently perceived in the process, and the lack of governance in some regions of the country which affects the implementation of any measure to be taken. No reference to any post-activity auditing was found.

In accordance with applicable regulations, only listed oil and gas exploration and production activities are required to hold a prior environmental license. Activities not requiring an environmental license (including seismic exploration) no may require local environmental permits associated with the use of specific natural resources on a case-by-case basis, and in addition, operators must carefully review restrictions on operations derived from the classification of protected or excluded areas, zoning regulations and the growing number of basin management plans and programs (Lugo and Ricciulli, 2019). Under Colombian law, environmental authorizations are not considered acquired rights and may suffer modifications or limitations throughout the course of a project (Lugo and Ricciulli, 2019).

Decommissioning

Decommissioning is becoming increasing commonplace worldwide, as oil and gas infrastructure reaches its 30–40 lifespan, with numerous guidelines developed, as described in Oil & Gas UK (2017) and BEIS (2018). In the absence of clear guidelines, increased emphasis is placed on the regulatory bodies to carefully review, and subsequently approve, any plans for example for well decommissioning to ensure they will achieve long-term well integrity.

Key concern 8:
Existence of environmental or socio-economic risk assessments related to decommissioning of oil and gas wells and infrastructure, even in relation with older projects where the drilled well locations may not be known.

In Colombia, environmental licenses include the abandonment and decommissioning plan (Lugo and Ricciulli, 2019), with operators required to provide guarantees ensuring that decommissioning will be appropriately carried out (Boza and Rico, 2019). This is a requirement both under environmental laws and under the underlying agreements. A decommissioning fund needs to guarantee availability of resources to develop the decommissioning program, through any economic instrument approved by the ANH (i.e., trusts, bank guarantee). Said provision is mainly determined under contract, where ANH determines conditions of the decommissioning fund. It is also important to note that environmental licenses are composed of the EIA, the environmental management plans, the contingency plan as well, as the abandonment and decommissioning plan (Lugo and Ricciulli, 2019).

Certain procedures must also be applied when an oil well is dry (a 'duster') or must be abandoned due to mechanical problems, in which case the steps of physical abandonment, dismantling and restoration must be fulfilled. This can occur in any of the phases of the contract, leading to a variation in the obligations by the concessionaire according to the activities that must be performed in each phase (Boza and Rico, 2019). Despite these reported procedures, it is not clear whether there is a provision to address environmental or socio-economic risks associated with oil and gas infrastructure earmarked for decommissioning or which institutions are required to address decommissioning challenges should they arise.

1.3 National technical capacities on environmental management of oil and gas sector

The demand for environmental management of oil and gas activities has been steady for many decades in Colombia. Regulators have been completing reviews of impact assessments, followed compliance monitoring and appraised audits. Nevertheless, this category, focused mainly on technical capacities (knowledge and skills) within national institutions on management of environmental issues related to the oil and gas sector, from which one concern arose.

Key concern 9:
Absence of regular and institutionalized personnel training to keep up with changes in oil and gas technologies and associated environmental risks, at central and regional levels.

The level of technical capacities scored the second lowest overall, 68% in the CNA Questionnaire, though the sub-categories on environmental assessments and compliance monitoring (reflecting functioning systems with monitoring carried out by operators) were both deemed satisfactory, scoring above 90%, the first sub-category relates to training. While basic technical capacity is present in the relevant institutions, and training programmes have been and are undertaken, there remains the need for a more regular and institutionalized training regime. Respondents indicated that both national and regional governments do not have the equipment (including software) and adequately trained personnel, especially on current themes and technologies.

Promoting clean technologies

The second sub-category that emerged as needing strengthening and therefore of concern is the use of clean technologies, where there appeared to have been very little achieved with respect to developing national guidelines or even promoting pollution prevention and control at oil sites, resource efficiency, and clean technologies. There is the challenge of how to generate the necessary incentives for the industry to develop new techniques in hydrocarbon exploration and production activities, focused on decarbonising the operations. For example, in the case of geothermal activities, even though technical requirements may already have been issued, the government must consider how to promote these new unconventional energy sources.

Key concern 10:
The absence of an initiative or guidelines to promote clean technologies.

Since the Preliminary SEA report was drafted in January 2021, the Colombian government released a resolution in August 2022 that establishes the rules, requirements and conditions for sea area tendering procedures, in which wind energy promoters will compete for temporary permits to occupy an offshore zone. The national maritime authority DIMAR has selected marine areas of the Bolivar and Atlántico departments for the first leasing round, where wind farms with an installed capacity of at least 200 MW may be constructed. Offshore energy technology could be implemented to reduce carbon dioxide emissions in the country, helping Colombia to accomplish the goal of reducing 20% of carbon dioxide emissions by 2050 (Hernandez et al., 2015 cited in Arce and Bayne, 2020). The challenge going forward will be to ensure effective implementation.

Gender mainstreaming

The overall training related to environmental management in the oil and gas sector only partially addresses gender mainstreaming, gender aspects are only partially incorporated in EIAs, and the monitoring of environmental (and socio-economic) impacts does not generally provide gender-differentiated data.

Key concern 11:
Uncertainties on the strengthening of gender-differentiated data inclusion in EIAs and follow-up of environmental and socioeconomic impact.
Finally, gender equality in this sector had a very weak score overall, less than 40 %, with room for improvement in various aspects. This was, however, not marked as a concern later by the TWG in 2022.

The MEM presented a roadmap for the first time to formulate policy guidelines for gender equity in industry. The guidelines include: (a) Linking women in direct/indirect employment, decision-making positions, community participation scenarios and in the sector's value chain; (b) Culture for gender equality in the sector; (c) Articulation and coordination of differentiated actions for the sector in an inter-institutional and inter-sectoral manner; (d) Prevention of gender-based violence in the industry and community of influence; and (e) Prevention of different types of violence against women in the industry and community of influence. Despite this positive development, there are only partial efforts at gender mainstreaming in the sector. In final revisions, ANLA confirmed that the proportion of feminine personnel is now over 53%, which implies a positive result in this benchmark. Overall, the gender equality issue continues to need some attention and monitoring in Colombia, focused on incorporating gender aspects in EIAs, and including gender-differentiated data in the monitoring of environmental (and socio-economic) impacts.

1.4 Non-governmental organizations and civil society

In general, non-governmental organizations (NGOs) are present, and represent the public and have a voice that does engage over environmental issues. The overall score for this parameter was 75%.

Access to sites

Key concern 12:
Clarity on how NGOs/communities are allowed access to sites that affect local livelihoods.

By far the only distinctly weak area of the theme was the sub-category on whether local NGOs/communities have access to the operating areas of the oil industry to visit spill sites or take samples if needed, where the conclusion was categorically negative.

The results of CNA Questionnaire on civil society participation suggested there was uncertainty in the way civil society accesses information and participates in environmental issues associated with the sector, in some cases being simply consulted rather than actively participating and having a decision-making influence.

Though it was agreed that nowadays, civil society has better and improved access to information but could still be better informed. There were some differences amongst the respondents related to what is considered participation of civil society versus what is simply sharing information with civil society, and respondents noted that oftentimes participation of civil society is often subject to a range of influences.

Currently, most civil society organisations (CSOs), including NGOs, are independent and have little connection to the Government. However, Freedom House (2015) scored Colombia 4 out of 7 regarding civil liberties and 3 out of 7 on partly free political rights.

There are several NGOs associated with issues related to the oil and gas sector, some of which partner with the ANH to encourage best practices amongst oil and gas producers. The five main ones are:

- **USO – The oil workers' union** – Founded clandestinely in 1922.
- **Social Corporation for Community Advisory and Training Services** (COS-PACC) – Created in 2002.
- **Dejusticia** – Created in 2005.
- **Equitable Origin** – Present in Colombia since 2013.
- **Alliance for a Colombia Free of Fracking** – A coalition of 40 environmental organizations.
- **Corporation of the Defence of Water Territory and Ecosystems** (CORDATEC).

1.5 Local community participation

From CNA Questionnaire this category scored the equal-lowest, at 65 %, with all five sub-categories scored weakly. There were two areas of concern that emerged.

Key concern 13:
Need for enabling framework for improved participation of NGOs and local communities, and for enhanced two-way dialogue on environmental issues.

Key concern 14:
Clarity on how grievance procedures are formally recognized and followed to their resolution.

Local communities are only partially involved in consultations/decision-making processes related to the oil and gas industry. Similarly, more could be done to have local communities more active in raising environmental concerns related to the oil and gas industry. Access to formal grievance mechanisms do exist and are used, though not fully, and local communities are only partially able to resolve formal grievances raised.

According to a study by the Cinara Institute in 2016 (http://cinara.univalle.edu.co/), 115 socio-environmental conflicts were active in Colombia, with 80 % of them located in rural areas and 12.5 million of Colombians potentially impacted. In 54 % of the cases, the communities most affected are indigenous, afro-Colombians and farmers. The extractive sector was the main industrial sector involved in those conflicts.

Regarding complaints and grievances from local communities, there was agreement amongst participants that these are considered, and many times resolved but there is room for improvement in the way they are solved and followed up, as well as on the need for capacity building of communities (and associated NGOs). Among the latter, the focus needs to be on improvement in terms of communication, to strengthen the two-way dialogue and participation in the decision-making process, and on access to sites when there are disputes.

1.6 Academia

With a score of 100 %, participants confirmed that academia has fully participated in environmental issues associated with the oil and gas sector, including supporting the training and formal qualification of staff for the sector and regulators, and providing consultancy services to the sector. Participation of academia occurs at national, regional and local levels, yet despite the maximum participation on the sector, there was one concern raised.

Key concern 15: Need for dedicated post-graduate courses related to future technological, geological, and environmental aspects relevant to unconventional, offshore and enhanced oil recovery.

Limitations for academia to engage exist where public entities have not compiled information and data (e.g. of the Middle Magdalen Basin which has been explored for over 100 years). In some very technical areas when it comes to implementation, there is also lack of expertise in the country, especially considering the size, history and importance of the sector. When the oil boom occurred in the 2000s, Colombia did not have sufficient qualified workforce. As a result, many oil expert positions were filled by Venezuelans, emigrating since 2005 after a massive wave of layoffs at the national oil company in Venezuela. Since then, Colombian universities began making up the deficit in producing qualified professionals, with approximately 500 students graduating with a degree in Petroleum Engineering each year.

Colombia has 35 public universities and almost 50 private institutions in the higher education. The four institutions that provide training in fields related to the oil and gas sectors are:

National University of Colombia: The oldest, most prestigious and largest public university offering a graduate programme as well as a Msc in Petroleum Engineering and involved in hydro-geological studies and remediation of produced water from oil production, and on bioremediation.

University of Industry of Santander (UIS): A public university closely associated with the oil industry, training students and technical staff on refineries, petroleum engineering and geology, and contributing to the mapping of 'pasivos' (see Section 2.1, Annex 4), and on remediation approaches.

University of America: A private institution that offers programmes on unconventional oil, as well as separation and treatment of crude oil.

University Surcolombiana: A relatively new private university that opened an oil engineering program, following the oil boom in Colombia and the rapidly growing demand for highly qualified professionals in the hydrocarbon sector.

1.7 Print, visual and social media

In general, the media platforms are active and do perform, with an overall score of 85 % allocated by CNA Questionnaire participants. However, of the five sub-categories, one stands out as needing improvement: the lack of experts knowledgeable about oil industry and related environment issues in Colombia. In general, the scientific level or access to professionals is limited to those from the industry's professional associations who have improved their capacity to provide responses to the media. Consequently, regarding the role of media in promoting environmental aspects of the oil and gas sector, it is regarded to be limited overall, in terms of the media's general awareness of the pertinent issues within the petroleum sector. This finding lead to a single concern on this theme.

Key concern 16:
Need for technical training and awareness raising for the media on current and future aspects such as unconventional, offshore and enhanced oil recovery technology and associated socio-economic and environmental issues.

The 2017 World Press Freedom Index ranked Colombia the 129th country in terms of freedom of information, out of a total of 180 countries. The latest available Freedom of the Press report (2016) brackets Colombia's freedom of press status with a score of 56 out of 100 (0 being the best, 100 the worst).

Television is the main source of news, information and entertainment in both urban and rural areas. In contrast, radio is the media with the highest penetration rate in the national territory, being particularly important for local news in rural areas, with almost all parts of Colombia covered by the local radio. Print media are privately owned, with three companies controlling 57% of the print market, as well, as television and radio stations. Newspapers are sold and read mainly in large cities and do not circulate much in rural areas. There are some 50 newspaper publications in circulation in Colombia. Internet use is widespread amongst the upper and middle classes in Colombia and growing fast, despite being amongst the most expensive in the world. The national media represents the dominant economic groups with political interests while the local media does not have an enabling environment on security issues for reporting on relevant social and environmental situations.

In summary, the immediacy of the news rarely allows for timely in-depth responses with unbiased professional scientific input, with most media reports simply responding to environmental emergencies. Thus, the industry could benefit from more knowledge on management initiatives, such as pilot projects for fracking and upcoming technologies and issues.

1.8 Private sector

With a CNA Questionnaire score of 100 %, the private sector clearly has been fully integrated into the oil and gas sector in Colombia. Private companies work on EIAs, pollution issues and waste management, reflecting the sufficient availability/supply of national consultants with adequate knowledge on environmental issues (benefiting from the academic infrastructure described above). Professionals in the sector have regional and international experience linked to the oil industry and are routinely engaged on environmental issues.

According to the above, the only key concern relates to the suitability of professionals who carry our EIAs and their knowledge and relevant experience.

Key concern 17:
Uncertainty over the suitability of professionals who carry our EIAs.

The oil sector is dominated by the national stakeholders, namely Ecopetrol, that recently became partially privatized, with nearly 15 % of its shares owned by private investors. Ecopetrol has been, until 2003, the obligatory partner of private companies as well as the regulator and managerial entity of oil resources. The oil sector is dominated by national entities, particularly Ecopetrol, which has recently been privatized, with almost 15% of its shares belonging to private investors. Ecopetrol was, until 2003, a mandatory partner to private companies, as well as the regulatory entity and manager of oil resources. Foreign companies no longer have to partner with Ecopetrol. Since ANH's inception in 2003, exploration and production contracts allow any company that meets the requirements to participate in the process to have an exploration area adjudicated, with Ecopetrol participating in the process as well. Ecopetrol accounts for about 60 % of the country's total oil and gas production in 2014 and owns the five major refineries in the countries. According to the Superintendence of Industry and Commerce, Ecopetrol also owns and operates 80 % of the pipelines in Colombia.

Private companies have also played an historical role in the discovery of oil fields at the beginning of the 20th century. Their presence in Colombia has greatly fluctuated, depending largely on the Government's measures to attract investors. Nowadays, more than 100 international oil and gas companies operate in Colombia, often in joint ventures with Ecopetrol or other operators. The private sector's role in implementing new technologies is a potential cooperation area that should be supported.

1.9 Emergency preparedness and response

Emergency response and disaster risk reduction

In the CNA Questionnaire, this category scored the equal-lowest score, 65 %, with two of the five sub-categories driving down the overall score. In general, there is a response institutional infrastructure, with assigned roles and responsibilities, systems and agreements in place. The weak areas are on early warning systems and personnel training, where in both cases there is very little in place and much more could be done to improve the situation, especially in relation to offshore emergencies.

As described earlier, a big challenge for the oil and gas industry in Colombia lies in its linkages with the conflict, the targeting of oil pipelines by guerrilla groups, occasionally leading to shut-downs on production for several months. In 2012, the FARC blew up the trans-Andean pipeline in the city of Tumaco, leaving 160,000 inhabitants without potable water for almost three weeks, and leading to the contamination of three local river-basins. The attacks to Colombian pipelines during the last 35 years have resulted in 4.1 million spilled barrels, equivalent to 16 Exxon Valdez disasters, according to the National Planning Department. This led to massive contamination of streams and rivers in the affected areas, as well as soil pollution, with consequences on biodiversity (Diálogo, 2015). Between 2009 and 2013, 787 water sources were affected, and it is estimated that up to 60 % of Colombia's water sources might be contaminated by illegal extraction of minerals and oil spills (National Department Plan, 2016). Many incidents are also caused by equipment failure and poor management. Unfortunately, most oil spills in Colombia go unreported because they are the result of activities carried out by illegal groups. However, PNC coordinators should provide third party support for any type of emergency and will also be available to deal with primary spill emergencies even when the defined responsibility is not known.

Since 1999, Colombia has had a **National Contingency Plan** (NCP) for responding to spills of oil, products and harmful substances at sea and continental waters. The revision of the NCP, which was in the process of being updated for a long while, was finally completed in 2021. However, the government's most recent update to NCP, provided by Minambiente, confirms that applying the procedure that establishes advanced dumping response techniques is yet to be completed.

Key concern 18:
Completing the update of the National Contingency Plan (2021), finishing the procedure that establishes advanced dumping response techniques and including conflict risk assessment.

Notably, since the Preliminary CNA was drafted, the NCP was fully updated in 2021 and has three basic components: strategic, operational and data-driven. The revised NCP was developed with the cooperation of UNGRD, MME, ANH, Minambiente, ANLA, Marine Directorate (DIMAR), Ministry of Transport, national defense, fire services and public and private oil companies. Under the NCP, an incident notification, alert, and reporting procedure has been in place which allows local authorities, environmental authorities (regional and national) and disaster risk management authorities to be informed in a timely manner of the occurrence of an event and the response actions taken. A National Information System exists for disaster risk management from natural disasters, with parts of the information being made public, and others are only accessible to authorities. This has been updated in line with the new NCP.

Until recently, the country is not prepared for big emergencies (e.g., the recent Rio Mayo and Lizama in Santander incidents) (Figure A3), but many lessons have been learnt. It remains to be seen whether the revised NCP and the modalities therein will effectively respond to incidents on land and at sea. The concern raised on the issue of the response system may still be applicable.

Figure A3: La Lizama well spilt crude into a tributary of the Magdalena River. Credit: René Dávila

Key concern 19: Early warning system and preparedness for offshore emergencies/disasters need attention.

In 2012, the World Bank published a study on disaster risk management (DRM) in Colombia, analyzing the institutional framework and national and local policies regarding DRM. In conclusion, the study stated that there is an increase in disaster risk due to inadequate management, for four main reasons:

- Difficulty to incorporate the conceptual advances about the relationship between risk and development as a national policy.
- Absence of risk management in land use and environmental plans.
- Lack of incorporation of risk management into sectorial plans, including transport and energy.
- Predominant vision that the responsibility is only of the Government, discouraging societal participation, notably from in the private sector.

The 2012 reforms on DRM tried to address these issues, notably with a more comprehensive approach, making a clear linkage between environment management, land use and risk management. The National Risk Disaster Management System was created, and the

National Risk Management Plan enacted in 2016. The system is comprised of five central entities in coordination, together with local level teams, as follows:

- National Council for Risk Management
- National Unit for Disaster Risk Management.
- National Committee for Risk Knowledge
- National Committee for Risk Reduction
- National Committee for Disaster Management
- Departmental and municipal councils for Risk Management

However, gaps still remain in DRM in Colombia, such as the need to integrate a multi-hazard approach and to include the conflict dimension into risk management policies and strategies. A proposal exists to update the NCP whilst enhancing the National Information System for Disaster Management and to integrate a national early warning system for the oil and gas sector. Currently, the procedure uses as a channel the VITAL Platform, administered by the ANLA. Warning systems for the oil/gas sector have been or are regularly tested, based more on reacting to real emergency events rather than preparedness planning, due to the numerous incidents of spills.

Emergency response capacity

In Colombia, all public and private organizations handling hydrocarbons are obliged to have contingency plans in place that fit with the criteria developed under the NCP. Currently, each company must respond with its resources or within the framework of mutual support mechanisms with other companies. They can also respond through third parties, i.e. through companies specialized in spill response that subcontract to deal with incidents that occur. Most companies responsible for these activities tend to plan and execute annual schedules of simulation exercises and drills, with different levels of activation, involving communities and municipal, departmental and national authorities, depending on each case. Thus, when it comes to onshore emergencies by known companies, the situation is deemed manageable, but for orphan emergencies or 'pasivos' (section below), the country lacks capacities to deal with them. On offshore issues, respondents did not believe that the country is prepared to face emergencies/disasters.

Key concern 20: Capacity training programmes to reflect national capacity needs, aligned with unconventional, offshore and enhanced oil recovery technology and associated socio-economic and environmental issues.

Besides emergencies, there is the issue of the capacity needed to maintain pipeline and equipment integrity to avoid spills and accidents. In this sense the country has advanced significantly. Meanwhile, regular update/revisions to government training programmes to reflect national capacity needs have recently been addressed, with a view to updating the NCP, in order to improve the skills of officials from the environmental authorities (ANLA and Minambiente), operational entities (Colombian Fire Department, National Navy) and monitoring and control (DIMAR).

2 Other areas of relevance

2.1 Contaminated sites and their remediation

As described in the previous section, there are sites contaminated by illegal extraction of minerals and oil spills and water sources affected. The on-going study with ANH and UIS is documenting '*pasivos*' – contaminated sites that are outside the jurisdiction of oil or mining companies, and that pose a threat to human health and/or the environment. It is widely known that most '*pasivos*' are in fact related to third-party actions as a consequence the country's internal conflict which has affected oil infrastructure. Related to this are two concerns that likely remain relevant.

Key concern 21: Support for the ongoing comprehensive mapping of orphan contamination sites (or '*pasivos*') and prioritizing for remediation.

Key concern 22: Need for training on contaminated site remediation techniques appropriate for the Colombia context.

In 2020 there were 5,925 identified and geo-referenced contaminated places or places with potential to configure an environmental '*pasivo*', with 40% oil-based and 50% related to mining. Oil spills are required by law to be notified, but other contaminations (e.g. pesticides) are not documented, many non-visible chemical contaminated sites are still unreported, and some areas are un-surveyed because of security constraints.

Laws for environmental protection are generally related to activities that are issued permits, with little legal attention to legacy sites/pollution resulting in environmental damage or pollution, including on '*pasivos*'. Hence some environmental issues are not adequately captured under existing legislation. Ecopetrol confirmed that many sites outside company jurisdiction (e.g. from sabotage, illegal refineries, etc) need attention, that knowledge on remediating contaminated sites is lacking and that companies also need assistance with remediation.

2.2 Emissions and Flaring of Gas

The Government of Colombia officially submitted its revised Nationally Determined Contribution (NDC) on December 29, 2020. Colombia's NDC is considered one of the most ambitious in the Latin America and Caribbean region thus far and is much more closely aligned with the country's objective of achieving carbon neutrality by 2050. Colombia is a member of the Climate and Clean Air Coalition since 2012 and EcoPetrol, the largest petroleum company in Colombia, is a member of the Oil and Gas Methane Partnership 2.0.

It aims to reduce greenhouse gases by 51% (169.4 $MtCO_2e$) and black carbon emissions by 40% in 2030 compared to 2014 levels. The new 2030 target for GHG emissions (169 million tCO_2e) is down from 265 million tCO_2e in the original NDC submitted in 2018. Emissions due to gasoline, kerosene, jet fuel, ACPM and fuel oil represent about 27% of the country's total emissions, that is, about 51 Million Tons of CO_2 equivalent.[4]

As per the Portfolio of Sectoral Mitigation Measures on Climate Change under Colombia's revised NDC 2020, specific actions on reducing GHG emissions include:

1. On CO_2, CH_4 and N_2O: Increased energy efficiency (Strengthening of the Program for the Rational and Efficient Use of Energy or PROURE) with a modelled mitigation potential between 1.21$MtCO_2e$ (PIGCCme)[5] and 0.956 $MtCO_2eq$
   a. Promote the definition of goals, actions and strategies in the PROURE with their respective percentages of improvement in energy efficiency, reduction of emissions and associated benefits
   b. Identify guidelines to optimize the dispatch of electrical energy, in order to promote an increase in efficiency in power plants that allow for the reduction of GHG emissions, without affecting the conditions of the electrical market
2. On CH_4: Promotion of proper management of fugitive emissions associated with the hydrocarbons production chain and take advantage of captured natural gas for other purposes with a modelled mitigation potential between 3.24$MtCO_2e$ (PIGCCme) and 0.39 $MtCO_2e$
   a. Obtain and validate information on the generation of fugitive emissions, this being a fundamental tool for the definition of proposals for sectoral mitigation agreements and maximum conditioning limits of emissions. Likewise, it allows determining the baseline, the reduction potential and the maintenance of the information system
   b. Integrate a set of measures aimed at reducing fugitive emissions generated by the activities of extraction, processing, production, storage and distribution of hydrocarbon products (oil and gas), as a necessary tool to monitor and control the uncertainty of cumulative mitigation in fugitive emissions.

Colombia's Third Biennial Update Report (2022) to the UNFCCC includes a national inventory of greenhouse gases for 1990-2018 as well as annual national GHG inventory for 2018.[6] For the year 2018, a total of 302,974 Gg of direct GHG CO_2eq has been reported, of which: 70.2% corresponds to CO_2, 24.3% to CH_4, 4.4% to N2O, 1. 1% to HFC-PFC and 0.1% to SF_6.[7] From the oil and gas sector, overall direct CO2 emissions record 2.671,08 Gg CO_2e, CH_4 emissions 2.876,70 Gg CO_2e and N_20 emissions 10.30 Gg CO_2e.

For the GHG emissions during 1990 to 2018 from the oil and gas sector, CO_2 and CH_4 participate proportionally, with 48.4% and 51.4% respectively, the participation of N2O is marginal.

Methane is the second most abundant anthropogenic GHG after CO_2, accounting for about 20 percent of global emissions. Though methane is in the atmosphere for a shorter period of time and is emitted in smaller quantities than CO_2 , its global warming potential is 28-34 times greater. Methane also represents the greatest near-term opportunity with the largest emission reduction potential of 35% resulting from no-cost activities. At COP26 in November 2021, Colombia joined the Global Methane Pledge and in February 2022 signed a resolution (Resolution 40066/22) to reduce methane in the hydrocarbons sector. The goal is to reduce emissions by 11.2 tons of CO_2e by 2030.

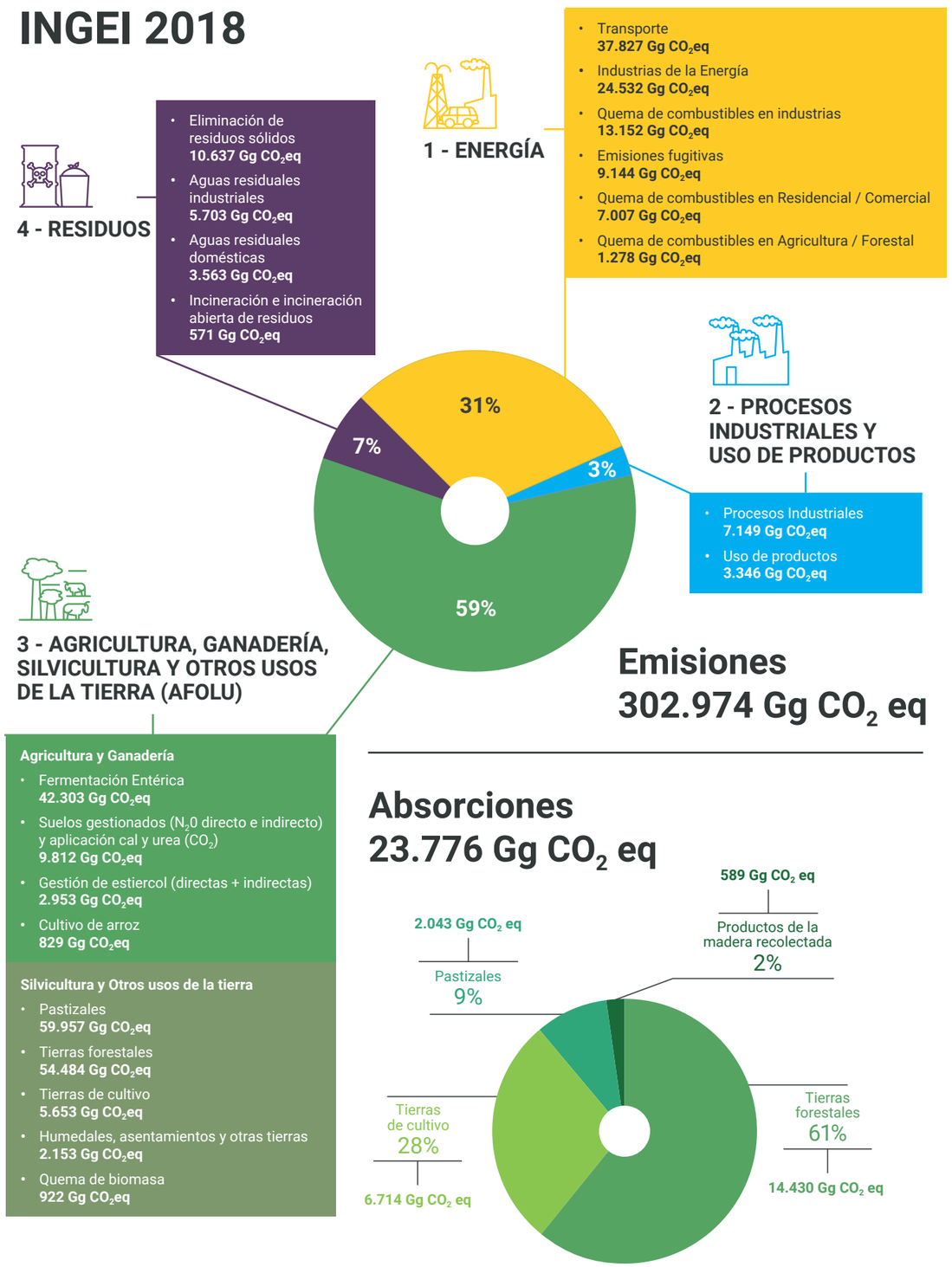
[4]ABC del impuesto al carbono (Minambiente, 2022)

[5]Comprehensive Climate Change Management Plan for the Mining and Energy Sector (PIGCCme)

[6]In the case of emissions from oil and natural gas, the emission factors for CO_2, CH_4 and N_2O correspond to the default values reported in the IPCC 2006.

[7]On the other hand, CO_2 absorptions correspond to -23,776 Gg of CO_2eq. As a result, net emissions (net balance) for 2018 are estimated at 279,198 Gg of CO_2eq.

Figure A4: National GHG Inventory (BUR3, 2022).



Operators in Colombia can, in accordance with the provisions of the competent environmental authority within the framework of an environmental license, flare the gas recovered on the surface as a result of well control operations and initial production tests during the development of exploratory drilling. ANH and MME issued Resolution 40066/22[8] to increase operating efficiency and reduce fugitive emissions by which technical requirements have been established for the detection and repair of leaks, the use, burning and venting of natural gas during hydrocarbon exploration and exploitation activities. It also aims to reduce natural gas waste and contribute to climate change mitigation measures by reducing greenhouse gas emissions caused by leaks and the burning and venting of natural gas. Under this resolution, clear technical criteria are established for gas flaring permits, indicating how to submit applications, what volumes are involved, how these volumes are quantified and justified, standardizing the process. It also bans all venting during exploration except for safety and as part of drilling activities, while all venting is banned during production. In all instances, the vented volumes and the underlying reasons for venting need to be reported. The resolution also identifies the need for detection and repair of natural gas leaks in the facilities.

All flaring requires prior approval from the ANH as per ANH Circular 18/2014. Operators are also obligated to report the volumes of total gas produced; associated gas used for generating electricity, running compressors, or re-injection; and gas flared within the first seven days of each month. Similarly, the new resolution also mandates reporting of gas being vented and requires the quantification of gas captured to avoid venting, and verification every year, through a third party, that flares are operating efficiently.

For flaring, Resolution 40066/22 refers to the use of infrared camera to determine the generation of smoke from the burning of liquid hydrocarbons or emission measurement drones to check the status of the ignition system of pilots or similar equipment. In the case of venting, daily measurement of such volumes must be made through instruments calibrated and certified by calibration laboratories accredited under the ISO/IEC 17025 Standard by ONAC, or by an accreditation body member of the ILAC recognition agreements. For the measurement of gases in floating roof tanks, the use of cameras or similar equipment available in the industry must be implemented. Methods other than direct measurements, such as engineering estimates, may be used to fulfill measurement requirements in special cases and with prior authorization from the supervisory authority (MME Resolution 41251/2016). The Resolution also lists the types of equipment that may be used for the detection and quantification of natural gas emissions.[9]

Operators are also required to collect associated gas and utilize it in any of the operations of the process chain (self-generation, consumption, injection or sale), through the application of equipment, technology and in accordance with the good practices that must be applied.

Operators must quantify the volumes of associated gas, in order to technically and economically evaluate the alternatives and technologies that can be applied, so as to plan, carry out the procedures and modifications required for the implementation of such use. The production facilities that are in operation at the entry into force of this resolution and that do not have the necessary connections for the use of associated gas is obligated to make the required adjustments for such purpose within a term of 24 months from the date of issuance of Resolution 40066/22.

Resolution 948/2022 issued by ANH adopted the guidelines that operators in charge of hydrocarbon exploration and exploitation activities must follow to submit to the ANH: (i) the Program for Detection and Repair of Natural Gas Leaks (the "PDRF") and (ii) the Emissions Baseline necessary for the quantification of these leaks (the "Baseline").

The Oil and Gas Methane Partnership 2.0 (OGMP 2.0), managed by the UN Environment Programme's International Methane Emissions Observatory (IMEO), a measurement-based methane emissions reporting framework (which EcoPetrol is a member of) provides a platform for companies to credibly report on their methane emissions performance so that stakeholders may verify and utilize this information for decision-making. Under the OGMP 2.0, companies report on all material sources of methane emissions from the entire oil and gas value chain, including both operated and non-operated assets.

[8]Repeals and replaces MME Resolution 40687/2017

[9]For detection of natural gas emissions, Optical Gas Visualization Instrument (OGI), Laser Leak Detector, Soapy Solution Detection, Organic Vapor Analyzers (OVAs) or Toxic Vapor Analyzers (TVAs), Acoustic Leak Detection, Electronic Gas Detector, or other duly authorized instrument may be used. Whereas for quantification of such emissions, Quantification of Optical Gas Display Instrument (QOGI), Calibrated Bag Measurement, High Volume Sampler, Blade Anemometer, Hot Wire Anemometer, Turbine Meter, Acoustic Detector, Orifice Meter or other duly authorized instrument may be used. The use of instruments shall be complemented with technical and visual inspection and in some cases, if possible, with the use of aircraft, satellites, drones, robots, vehicles, area scans, stationary infrared cameras, among others.

The International Methane Emissions Observatory (IMEO) is also planning a large-scale methane measurement campaign of oil and gas infrastructure in Colombia, led by Carleton University and with support from Ecopetrol that could serve as a baseline emission estimate for the sector IMEO is also considering expanding the measurement campaign to include all sectors in Colombia to provide a comprehensive baseline.

The Clean Climate and Air Coalition (CCAC) is currently supporting the MME with the implementation of their methane regulation for the oil and gas sector towards the following:

1. Develop and finalise the reporting formats/templates related to the guidelines for the regulation of Leak Detection and Repair (LDAR), including providing inputs to the draft "Rules for the publication of the Leak Detection and Repair Program" that has been prepared by the ANH.
2. Map the administrative structure with roles for each department necessary for implementing the regulation.
3. National workshop for operators to familiarize them with the PDRF Rules published by the ANH and the information capture formats so as to provide more details to operators about the scope of the information required in the Baseline as well as the PDRF.
4. Review of human, technical and technological requirements for both inspectors (field) and data analysts (evaluators) from ANH in order to develop a final document that will provide a technology assessment and a proposal for technical profile for ANH auditors on the field and analysts that can evaluate the performance in emissions through time.

The Terms of Reference for EIAs are also being updated by Minambiente to specifically include measures to monitor GHG emissions from the oil and gas sector. The environmental safeguards that will be established through such updated guidelines will make the MME Resolution 40066/2022 more effective in reducing emissions from the oil and gas sector.

Key concern 23:
Need for monitoring of flaring and other sector-related emissions.

Based on these recent developments, there may be little cause for concern related to gas flaring in Colombia. However, there is still the need to ensure monitoring does actively take place, based on measurements of actual emissions, with a certifiable and verification process, to assess whether it is necessary to change or modify the existing regulation to improve compliance. Industry compliance of greenhouse gas emissions is partially or not monitored by Government agencies, thus emissions of associated gases, methane leaks and emissions of other volatile organic compounds (VOCs) also require attention.

2.3 Accredited laboratories

On certified laboratories, especially relevant for analysis of contaminated soils and water, the main challenge reported is that the main certification agency Organismo Nacional de Acreditación de Colombia (ONAC) lacks technical capacity for hydrocarbon sampling and analyses. A concern persists that once resolved would allow a clear strategy to be formed to address accreditation of analytical facilities.

Key concern 24:
Conduct an evaluation of needs for in-country capacity building related to the accreditation of analytical facilities for oil and gas sector monitoring considering future developments in the sector.

At least one international laboratory is established, AGQ Labs, which is accredited for various analyses relevant to the oil and gas sector. One approach suggested would be for interested parties to form a consortium to fund and run a certified laboratory. Currently, the Minambiente is also involved in a comparative study of chemical laboratories with respect to accreditation. At IUS there is a Laboratorio de Chromatografia, equipped to carry most analyses, but there is uncertainty on whether technicians, techniques and equipment are accredited.

2.4 Fracking

Fracking is used to extract hydrocarbon reserves from existing wells where natural pressure lows have ceased to bring oil to the surface but is also used in new wells in areas not previously explored, where the reserves are considered 'tight' and not accessible with traditional techniques. Even though there is national consensus on the need to prohibit fracking in Colombia, MME and Minambiente are. currently debating the exact definition of fracking, before passing an act to prohibit it.

Key concern 25:
Need for a nation-wide risk assessment to determine high-risk areas related to unconventional exploration techniques, to feed into a spatial planning/SEA process.

Under the current Government the pace of development of fracking is still uncertain, mindful of requests for a moratorium on fracking, over potential environmental and public health impacts. The Colombia MME is in the final stages of establishing a regulatory framework for fracking projects, which are exempt from a moratorium on unconventional oil and gas drilling. Currently there are two fracking pilot projects in Colombia, Platero and Kalé, both in the town of Puerto Wilches, in Santander department, in the Northeast of the country. Directed by ExxonMobil and Ecopetrol, the projects, which also overlap in the Magdalena River basin. They are currently suspended while the legal position on fracking is being clarified. There are seven other contracts for unconventional oil and gas extraction. All of these have given rise to concern over this production technique which uses a lot of water to extract oil and gas. However, under the current government, a bill against fracking passed the first parliamentary debate in mid-August 2022 and still has to undergo three additional debate rounds before being voted on. According to the ACP, the initiatives in the Middle Magdalena and Cesar-Ranchería basins could eventually produce 450,000 boe/d and attract USD 5 billion in annual investments, helping to replace Colombia's dwindling hydrocarbon reserves. Despite the attractive investment, concerns persist over the ability for local authorities to conduct environmental monitoring of this emerging sector.

Key concern 26:
Requirements for in-country capacity building related to unconventional oil and gas sector exploration and environmental monitoring considering future developments in the sector.

In the provinces of Cesar and Cundinamarca where exploratory fracking drilling first started, demonstrations and protests followed, led by NGOs. CORDATEC (2017) estimated that 300 municipalities could be impacted overall, warning of the risk of contaminating the water supply system of millions of inhabitants. Moreover, exploration areas for unconventional hydrocarbons also overlap with territories of indigenous communities, such as the Yupka, Wiwa and Wayúu people. Unconventional exploitation's related issues such as contamination risks to hydrological resources (surface water and aquifers) remain of particular concern and were repeatedly raised by respondents and stakeholders consulted.

2.5 Offshore exploration

Just like offshore explorations in the rest of the world, the ones carried out in the Colombian Caribbean Sea pose a potentially serious threat to marine and coastal ecosystems. Assessing the environmental viability over exploration and production is a particularly conflictual process, in which legal procedures are followed to obtain approval on viability of hydrocarbon activity in a context in which it is necessary to lean on instruments apart from mere environmental viability. The Ministry, with help from other entities has been working on formulating guidelines for the development of offshore hydrocarbon exploration and operation, and has received input from Norwegian entities with ample experience on the matter. In spite of this, there is still a road ahead. That is why Minambiente, being conscious of the importance that activity regulation has for the country, continues working towards reaching this goal. In this context, there is a concern related to monitoring, because, at the moment, there is no clarity in the follow-up functions regarding security in infrastructure and/or fixed equipment offshore. This is more directed towards hydrocarbon production and transport.

Key concern 27:
Lack of skills in and alignment between oversight institutions related to offshore oil and gas activities and addressing risks.

One hotspot of marine biodiversity is the Archipelago of San Andres, a Caribbean island chain that holds more than three-quarters of Colombia's coral reefs and a UNESCO Biosphere Reserve. Ecopetrol, Repsol and YPF's plans to start exploring and producing were stopped in 2011, when the Administrative Tribunal of San Andres, upon the request of local environmental organizations and authorities ordered the ANH to suspend the signature of exploitation and production contracts with the hydrocarbon companies (Environmental Justice Atlas, 2015).

As an incentive seeking the promotion of offshore oil and gas activities, the Colombian Ministry of Trade, Industry and Tourism and the Ministry of Finance issued the Decree 2147 of 2016, which allows the declaration of permanent offshore free trade zones. In short, these free trade zones allow companies operating offshore to benefit from a significant tax reduction and a more favourable customs regime (Lugo and Ricciulli, 2019). Entities such as DIMAR and the environmental investigations institute INVEMAR are playing an increasingly prominent oversight role in the offshore environment (Lugo and Ricciulli, 2019), but despite their presence, recognized challenges include, among others, the management of dispersant chemicals and *in situ* flaring.

Although the current government's vision is focused more on diversifying energy sources, with a strong focus on renewables, attracting foreign investors through regulations that promote industries such as oil and gas continues, including in offshore areas. In late 2021 ANH's fourth bid round included four offshore blocks in the Pacific Ocean acreage in the Choco and Tumaco basins (Figure 2) and Colombia's offshore Caribbean basins have attracted foreign interests since 2019 which are planning more offshore drilling in 2022.

2.6 Environmental data relevant to the oil and gas sector

The value of having a complete set of up-to-date data on the condition of the marine and terrestrial environment, including biodiversity and environmental parameters, hosted by a digital platform and accessible to all relevant entities cannot be overstated. The three main features of environmental datasets are its availability, its accessibility to end users, and the capacity of users to work with, operate and benefit from the information.

Key concern 28:
Lack of an environmental database for use in integrated spatial planning to addresses multiple environmental, social and economic interests for oil and gas development.

In Colombia, there are a number of existing databases, hosted by diverse public and private institutions (e.g., INVEMAR portal with ANH, Humboldt Institute, natural sciences departments at national universities, and DIMAR has a tool related to environmental sensitivity maps for hydrocarbon spills to create an index of sensitivity), with many others related to air quality and terrestrial biodiversity. The MME, under Law 1712 of March 6, 2014, and Resolution 1519 of August 24, 2020, now makes available to citizens, the new section of Transparency and Access to Public Information, for a range of information types relevant to the sector. However, so far there is little evidence of an environmental database that can be used to increase the use of spatial data in policy and decision making, nor for the development of sensitivity atlases, especially to guide offshore exploration activities and for use in the event of an oil spill.

Customizable GIS platforms have been developed to increase use of spatial data in policy and decision making and could be readily deployed in the Colombia context at relatively low cost. However, a long-term strategy to maintain the platform, ensure capacity for its use, and update source datasets needs to be considered. Equally, non-technical barriers to data sharing would need to be addressed.

Key concern 29:
The lack of an oil spill sensitivity atlas for the Caribbean Sea coast of Colombia where oil and gas exploration and production, although there are current efforts to address this gap.

As described in Section 1.2 of this Annex 4, in the development of an SEA for the oil and gas sector, one of the typical elements included is spatial planning to address potential area-based conflicts between sectors. Such plans require environmental data sets. Similarly, to assess the sensitivity of the environment to these multiple pressures, sensitivity atlases are commonly used (for example, TanSEA[11] in Tanzania, Zansea[12] in Zanzibar and KenSea[13] for Kenya).

It is important to note that INVEMAR and DIMAR have made progress on the coastal environmental sensitivity map for the entire Colombian Caribbean. Likewise, INVEMAR, through agreements signed since 2007, has carried out a general baseline survey of marine ecosystems. The next steps would be to compile data from these and other entities and to classify geo-spatially the sensitivity of coastal ecosystems and socio-economic characteristics to oil spills.

[10]An example of such open access, adaptable GIS platforms is UNEP's MapX platform: https://www.mapx.org/
[11]TanSEA: Atlas de sensibilidad costera de Tanzania, disponible en http://www.tansea.org/zansea-conference/
[12]ZANSEA: Atlas socioambiental de Zanzíbar, disponible en https://www.suza.ac.tz/zansea-website/index.php
[13]KenSea: Atlas de sensibilidad ambiental para el área costera de Kenia, disponible en https: //www.oceandocs.org/handle/1834/7655

Annex 5.
Resource Mobilization

Introduction

The Norwegian Oil for Development (OfD) Programme has been offering capacity building support on environmental management in the oil and gas sector to countries in Africa, Asia, the Middle East, and Latin America since 2005. Under this OfD Programme, the Government of Norway and UNEP have established a partnership programme that offers technical assistance and trainings to these OfD supported countries.

Scope

In furthering this agenda, UNEP has commissioned rapid institutional capacity needs assessment (CNAs) for six countries to create a preliminary profile of the government institutions, legal/policy/regulatory frameworks, and existing technical capacities that add to the environmental governance in the oil and gas sectors. The CNAs are being prepared to identify strategic capacity development issues and accordingly create a roadmap detailing future resource mobilisation efforts for environmental management capacities in these countries. The CNAs will include a review of potential development partners in the country with whom the Colombian Government can establish cooperation.

Hence, this report is being created to provide a list of potential partners in Colombia with whom the government institutions can collaborate to support national efforts to strengthen environmental governance and management in the oil and gas sector.

Methodology

A qualitative research methodology was adopted to compile an initial excel document with available secondary data regarding potential partners who are involved in various environment/energy/pollutions related projects. These partners can be categorised as:

- Public: Bilateral agencies/aid agencies; UN agencies, International Finance Institutions; National Governments; and regional/local authorities
- Private: Corporate partners and their linked foundations; business/private sector associations, Chambers of Commerce/Trade, etc
- Domestic and international organisations, including NGOs
- Other bilateral organizations
- Academic: Public and private institutions
- Other training institutions

Based on the excel document, the following desk-based review was drafted detailing all the potential development partners for Colombia. This review includes concise descriptions and relevant web links of the following:

- Potential development partners, both **international** and **domestic** from the public sector (aid agencies, foundations, civil society/NGOs etc) or from the private sector (oil and gas associations, business associations, Chambers of Commerce, etc) or even academia.
- Existing capacity building/training programs being undertaken by partners in the country related to environment and/or oil and gas/energy issues.
- Other initiatives/projects being undertaken by partners related to environment and/or oil and gas/energy issues
- Potential training institutions in the country which the Government can partner with for sustainability of their training programmes

Partners other than the ones mentioned in this report and the details of their relevant projects are available in the attached excel document for further perusal.

List of potential development partners for Colombia

Oil is the main contributor to Colombia's finances and amounts to 55.4% of total exports. Since 1999, a series of oil policy reforms have allowed for the signing of more than 60 association contracts and the reactivation of the country's exploratory activity. The country is estimated to have an oil potential (crude and natural gas) of more than 37,000 million barrels equivalent distributed over 18 sedimentary basins. Around 89% of these basins are available to carry out exploration of oil and natural gas and amongst them, the most exploratory activities are carried out in the upper and middle valleys of Magdalena, Catatumbo, La Guajira, Cordillera Oriental, Putumayo and Llanos Orientales. The Colombian government hopes that the discovery of new oil reserves will allow the country to be energy self-sufficient in the future.

1. Food and Agricultural Organisation (FAO)

Project
Colombia Resilience Programme

Time Frame
Completed 2017-2020

Short description
The resilience programme aims to protect the agricultural sector from conflict and natural disasters by:

- Strengthening the technical capacities of institutions and communities to protect livelihoods in the event of a natural disaster or a crisis.
- Managing agroclimatic and social crises.
- Supporting vulnerable rural communities by helping them undertake risk analyses while also adapting their productive schemes to climate variability.
- Enabling the inclusion of small-scale vulnerable farmers in family agriculture markets.
- Fostering traditional methods of production and consumption.
- Ensuring the human right to food by establishing a model adapted to their situation and focused on the dignity of agricultural activities.
- Strengthening social cohesion by using training methodologies based on active participation that foster communities' joint efforts.

Funds available
USD 140 million

2. Government of Canada/Global Affairs Canada

Global Affairs Canada delivers results on the Government of Canada's commitments in diplomacy, trade, security, development, consular services, and humanitarian assistance and hence they fund multiple projects along the themes of agriculture, climate change and mining and extraction.

Project
Andean Regional Initiative – Promoting Effective Partnerships for Local Development – Colombia

Time Frame
Ongoing 24 March 2011–2023

Short description
The project aims to enhance the social and economic well-being of communities near extraction areas by:

- Building institutional capacity to help the local governments plan, manage and implement sustainable development investments and public services based on community needs.
- Knowledge sharing on corporate social responsibility methods and best practices.
- Setting up local funds that support local initiatives aimed at promoting sustainable community development in partnership with the private sector/extractive companies.

Funds available
2022-23: USD 408 thousand (budgeted)
2017-18: USD 115 thousand (disbursed)
2016-17: USD 593 thousand (disbursed)
2015-16: USD 865 thousand (disbursed)
2014-15: USD 1.7 million (disbursed)
2013-14: USD 1.5 million (disbursed)
2012-13: USD 1.6 million (budgeted)
2011-12: USD 1.5 million (budgeted)
2010-11: USD 6.1 million (commitment)
For: Colombia (100%)

Project
Climate Change, Agriculture and Food Security (CCFAS) Challenge Program – 2010

Time Frame
Completed 3 March 2010 – 31 December 2013

Short description

- Canada supports CGIAR (Consortium of International Agricultural Research Center)'s research program on CCAFS.
- CCAFS is led by International Centre for Tropical Agriculture (CIAT) in Colombia.
- Their activities include the development and evaluation of options for adapting to a changing climate to inform agriculture development; food security policy and donor investment strategies; and assisting farmers, policy makers, researchers and donors to monitor, assess and adjust their actions in response to a changing climate.

Funds available
2009–10: USD 5.5 million (disbursed)
For: Africa (60%), America (10%), Asia (30%).

Project
Canadian International Resources and Development Institute (CIRDI)

Time Frame
Ongoing 24 June 2013 – 2021

Short description
The project set up CIRDI in 2013, which is a coalition of the University of British Columbia, Simon Fraser University and École Polytechnique de Montréal.

- The institute seeks to assist developing countries in strengthening their natural resources governance through policy, legislation, regulatory development and implementation, training, technical assistance, and applied research.
- Some of their projects include transforming artisanal and small-scale mining in Ecuador and Colombia.

Funds available
2019-20: USD 2.2 million (disbursed)
2018-19: USD 1.4 million (disbursed)
2017-18: USD 4.4 million (disbursed)
2016-17: USD 4.7 million (disbursed)
2015-16: USD 5 million (disbursed)
2014-15: USD 2.2 million (disbursed)
2013-14: USD 2.4 million (budgeted)
For: Africa (35%), America (35%), Asia (30%).

3. Government of United Kingdom (UK)

The Government of UK has numerous innovative programmes in Colombia namely the International Climate Fund and the Newton-Caldas Fund.

I. International Climate Fund

Project
International Climate Fund

Time Frame
Ongoing 2010-2022

Short description
The ICF works in three programmatic areas: forests and land-use practices; sustainable infrastructure; and technical assistance.

Funds available
Total ICF Fund: USD 165 million

I. Forest and land-use practices	
1. *Joint Declaration of Intent with the governments of Norway and Germany:* The declaration announced in 2015 supports the Colombian Government in helping achieve zero deforestation in the Colombian Amazon.	
i) *Early Movers Programme:* This programme helps prevent deforestation through forest governance; sustainable sectoral development and planning; agri-environmental development; environmental self-governance; and institutional strengthening.	USD 38.7 million
ii) *BioCarbon Fund:* This fund contributes for payments to reward verified emissions to promote sustainable forestry and reduce emissions caused by the agricultural and forestry activities in the Orinoco region.	USD 26 million
2. *Tropical Forest Alliance 2020 (TFA 2020)* The TFA 2020 is a global public-private partnership in which partners work to reduce tropical deforestation associated with productive chains of raw materials, such as palm oil, soybeans, beef and paper.	NA
3. *Partnership for Forests (P4F)* Launched in 2019, the programme catalyses investments by the private and public sectors, helping civil society and local communities achieve a shared profit from the sustainable management of the forest and its uses.	
4. *Silvo-Pastoral Systems Programme (Sustainable Cattle Ranching):* This programme supports Colombian cattle ranchers to adopt mixed agricultural and cattle pasture techniques to improve and convert cattle grazing pasture into richer environments that help to conserve existing forests, capture carbon, improve biodiversity, and boost productivity.	USD 9 million
II. Sustainable Infrastructure Programme (SIP)	2017–2019
The programme seeks to support recipients to mobilise private investment in low-carbon infrastructure projects; provide technical assistance and concessional finance; and encourage the Government to increase non-conventional renewable energy generation capacity and low-carbon transport.	

III. Partnering for Accelerated Climate Transitions (UK PACT)

UK PACT is the flagship capacity-building programme within the UK–Colombia Partnership for Sustainable Growth.

- The programme calls for proposals that best support the Colombia's climate priorities across five sectors: green finance, sustainable mobility, climate policy, energy and forests and land use.
- The successful projects receive USD 686 thousand each and will work with government beneficiaries with the support of 32 lead organisations and partners from academia, private sector companies and NGOs from the UK, Colombia, and other countries globally. The full list of projects can be found in Annex I.

2018–2022
USD 40 million (expected investment)

First round of funding: USD 6.8 million
Funded 13 projects and 3 skill-shares

Second round of funding: USD 9.6 million
Funds 15 projects.

II. Newton-Caldas Fund

Project
Newton-Caldas Fund

Time Frame
Ongoing 2014–2021

Short description
The fund aims to build-up research and innovation capacity in the country for its economic development and social welfare.

1. *Colombia Bio*, is one of the fund's projects which seeks to promote knowledge, conservation, evaluation, management, and sustainable use of Colombia's biodiversity in a post-conflict scenario. The programme focuses on three major components: biodiversity scientific expeditions; research and development for decision making; and bio-innovation for the development of value-added products and services.

Funds available
Budget: USD 78.4 million
(50% Government of UK and 50% Co-financing)

USD 26.1 million

4. Green Climate Fund

Project
Colombia REDD+ Results-based Payments for results period 2015-2016

Time Frame
Completed 21 July 2021–21 July 2026

Short description
Colombia's REDD+ results for 2015-16 showed emission reductions of 5.5. MtCo2 eq when presented to the GCF for results-based payment (RBP).

Colombia will use the proceeds from the RBP provided to invest in activities that support the implementation of its Integrated Strategy of Deforestation Control and Forest Management (EICDGB). This will aid in:

- Strengthening the national and local capacities that monitor and control deforestation.
- Enhancing the sustainable management of forest areas and strengthening the territorial governance of indigenous peoples to manage and preserve forests.

Funds available
Budget: USD 28.2 million

Project
Scaling up climate resilient water management practices for vulnerable communities in La Mojana

Time Frame
Ongoing 29 May 2018-29 May 2026

Short description
The project aims to improve climate resilience for vulnerable communities in the Colombian wetland region of La Mojana through water resource management. This will include:

- Systemized knowledge management of the impacts of climate change on water management.
- Water resource infrastructure and ecosystem restoration.
- Early warning systems for climate resilience.
- Climate resilient agro-ecosystems to enhance rural livelihoods.

Funds available
USD 117.2 million
(32.8% GCF financing and 67.2% Co-financing)

5. Inter-American Foundation

The Inter-American Foundation has been providing over 397 grants worth USD 59.1 million to local organisations in Colombia since 1972. IAF supports a multitude of projects that introduce community-led solutions to protect the environment, provide economic opportunities for local populations, and strengthen natural governance in Colombia. Some of these projects are listed in the table below, more projects can be found in the annexed excel document.

Project
Creation and Operation of Emerger- Fondo Socioambiental Colombia

Time Frame
Ongoing 2020–2022

Short description
Grantee partner: Asociación Ambiente y Sociedad (AAS)

AAS is mobilizing international and national funding sources to create the Fondo Socioambiental Emerger (Fondo Emerger), a social-environmental fund inspired by the principles of community philanthropy.

- This fund will support initiatives led by community-based organizations and social movements to advance the sustainable management of territories, commonly held natural resources, and livelihoods.

Funds available
IAF Grant Funding: USD 160 thousand
Counterpart Commitment: USD 201 thousand

Project
Cultivating peace through family, farmer, and community agriculture

Time Frame
Ongoing 2020–2022

Short description
Partner: Corporación Buen Ambiente (Corambiente)

Corambiente supports over 70 organizations in the departments of Santander and Valle del Cauca to strengthen the production, marketing, and consumption of environmentally-friendly foods. Their aim to promote smallholder agriculture and food production to enhance food security and ensure opportunities for communities to thrive.

Funds available
IAF Grant Funding: USD 143 thousand
Counterpart Commitment: USD 99 thousand

Project
Environmental education and organizational strengthening to protect natural resources in the Serranía de Minas (Oporapa, Huila)

Time Frame
Ongoing 2019–2021

Short description
Grantee partner: Cooperativa Multiactiva Agropecuaria Regional San Roque Oporapa (Cooagrosanroque)

Cooagrosanroque aims to protect the region's key water resources by creating environmental awareness among children and young people from Serranía de las Minas; providing technical assistance to farmers on sustainable agricultural practices; and strengthening local organizations' capacity to address environmental challenges.

Funds available
IAF Grant Funding: USD 53 thousand
Counterpart Commitment: USD 19 thousand

Project
An Integrated Approach to Sustainable Ecosystems

Time Frame
Ongoing 2019–2021

Short description
Grantee partner: Fundación Ambiental DapaViva

DapaViva aims to promote sustainable ecosystems and livelihoods in four communities of Yumbo, Valle del Cauca. Their methods include engaging schools, residents, local businesses, community organizations, and the municipal conservation authorities in conserving their environment through applied education, eco-tourism, and strengthened monitoring systems.

Funds available
IAF Grant Funding: USD 132 thousand
Counterpart Commitment: USD 137 thousand

6. National Hydrocarbons Agency (Agencia Nacional de Hydrocarburos - ANH)

Banco de Información Petrolera or The Petroleum Information Bank (BIP) is the official repository of Colombia which receives, preserves, loads, guards and manages all the technical information from their national exploratory and hydrocarbon production activities. Administered by the ANH, this is the only official repository that provides these services. This information is then used by geoscientists and potential investors who carry out research and investment projects in exploration and hydrocarbon production.

BIP consists of three operational units:

(i) **The EPIS (Exploration and Production Service)** which manages the digital information; provides supply services to companies in the Hydrocarbons sector for the development of their projects and regional studies; and monitors the oil contracts and the technical structuring of hydrocarbon exploration opportunities.

(ii) **The National Litoteque** is a storage centre for all drilling products and cores from where their systemic study is promoted for the exploration and sustainable use of hydrocarbon resources and investigation of natural geological process.

(iii) **The Media Fund (Cintoteca Nelson Rodriguez Pinilla)** is another storage space for all physical media (analog and digital) produced by operating companies/ANH which have been received, catalogued, verified and uploaded in the EPIS.

7. United States Agency for International Development (USAID)

Project	**Time Frame**
Numerous Projects	As of 2019
Short description	**Funds available**
USAID funds several projects in Colombia that aid in disaster assistance, resource rights, humanitarian assistance, and agricultural programs.	USD 801 million

8. World Bank and Global Environment Facility

Project	**Time Frame**
Forest Conservation and Sustainability in the Heart of the Colombian Amazon Project	**Completed** 2015
Short description	**Funds available**
World Bank approved a grant from GEF that aims to reduce deforestation and conserve biodiversity by nearly nine million hectares in the Caquetá and Guaviare departments of the Colombian Amazon. – This project focused on the implementation of agroforestry production systems and the transfer of knowledge of forest conservation techniques and benefitted about 3,500 indigenous people in seven indigenous reserves.	USD 10.4 million

Project	**Time Frame**
Forest Conservation and Sustainability in the Heart of the Colombian Amazon Project	**Completed** 2017
Short description	**Funds available**
The GEF fund was renewed, and these new resources supported the expansion of protected areas (approximately 1.3 million hectares), and the consolidation of an existing 3.4 million hectares in the Amazonia.	USD 12 million

Project	**Time Frame**
Forest Conservation and Sustainability in the Heart of the Colombian Amazon Project	**Ongoing** 2021
Short description	**Funds available**
In addition to reducing deforestation in the Colombian Amazon, this new grant will expand the current project to improve forest, institutional and community governance and promote sustainable land use.	USD 18. 4 million

Other Potential Partners

This desk study aims to review potential development partners for Colombia who can provide funding or resources support to the Government. Other potential development partners that are not mentioned in this report are listed below:

- Andean Foment Corporation
- Caribbean States Association
- Economic Commission for Latin America
- Nature Conservancy
- Regulatory Energy and Gas Commission (Comisión de Regulación de Energía y Gas de Colombia)
- World Wildlife Fund

Conclusion

This desk review of potential partners that can serve as a preliminary desk study for long-term development programs in the country.

Notes


UN
environment
programme