

PETROLEUM CONSERVATION: DO INTERNATIONAL FRAMEWORK
AGREEMENTS FOR THE DEVELOPMENT OF TRANSBOUNDARY
HYDROCARBON RESOURCES EFFECTIVELY APPLY
CONSERVATION PRINCIPLES?

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Petroleum Conservation: Do International Framework Agreements for the Development of Transboundary Hydrocarbon Resources effectively apply conservation principles?

Abstract

The relationship between petroleum conservation and sustainable development is unquestionable. International Framework Agreements for the development of transboundary hydrocarbon resources play a fundamental role in strengthening petroleum conservation principles. So far the development of transboundary hydrocarbon resources has been mainly about drawing squares and triangles, with conservation as a secondary objective.

This thesis examines the role of petroleum conservation in six recent framework agreements. The study is built around the application of conservation principles for the development of offshore transboundary hydrocarbon resources. The work attempts to identify, analyse and synthesise the legal content regarding petroleum conservation principles in recent framework agreements, and based upon this suggest how future international instruments should be developed.

More than half of known petroleum reservoirs lie either across defined boundaries lines or in contested areas. Their development is becoming necessary to supplement current production which largely comes from mature basins. The need to further incorporate petroleum conservation measures for the benefit of everyone is therefore more apparent than ever.

The ancient choice between cooperation and conflict for developing shared resources must now be driven by conservation principles. The consolidation of sustainable development under international law provides a unique opportunity to see transboundary hydrocarbon resources with fresh eyes, with a more cosmopolitan approach in favour of nature and humanity as a whole. Petroleum conservation should not be left out of the broader international discussions on sustainability. Nations wealth is intertwined with shared geology, peoples and nature.

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Abbreviations

Aarhus Convention	Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters
ACHR	American Convention on Human Rights
AJICL	African Journal of International & Comparative Law
AJIL	American Journal of International Law
AJCL	American Journal of Comparative Law
Alta L Rev	Alberta Law Review
Am U Intl L Rev	American University International Law Journal
AMPLJ	Australian Mining and Petroleum Law Journal
ANZ MAR LJ	Australia New Zealand Maritime Law Journal
API	American Petroleum Institute
Ark L Rev	Arkansas Law Review
ARPEL	Industry body representing Oil and gas companies in Latin America and the Caribbean
ASIL Proc	American Society International Law Proceedings
Aust YBIL	Australian Yearbook of International Law
Authority	International Seabed Authority
Basel Convention	Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal
BAT	Best Available Technique
BC Env'tl Aff L Rev	Boston College Environmental Affairs Law Review
BEP	Best Environmental Practice
BIICL	British Institute of International Comparative Law
BJIL	Berkley Journal of International Law
BPEO	Best Practicable Environmental Option
Brundtland Commission	Report of the World Commission: Our Common Future
Cartagena Convention	Convention for the Protection and Development of the Marine Environment of the Wider Caribbean

Case W Res J Intl L	Case Western Reserve Journal of International Law
CBA	Cost Benefit Analysis
CBD	Convention On Biological Diversity
CCS	Carbon Capture Storage
CCL	Climate Change Levy
CEPMLP	Centre for Energy, Petroleum and Mineral Law and Policy
CERDS	Charter of Economic Rights and Duties of States
CH ₄	Methane
CISDL	Centre for International Sustainable Development Law
CJCR	Cardozo Journal Conflict Resolution
Climate Change Convention	United Nations Framework Convention on Climate Change
CLR	California Law Review
Colo J Intl Env'tl L & Pol'y	Colorado Journal of International Environmental Law & Policy
COLR	China Oceans Law Review
CO ₂	Carbon Dioxide
CO ₂ Tax Act	Act 21 December 1990 no 72 relating to tax on discharge of CO ₂ in the petroleum activities on the continental shelf (Norway)
CUP	Cambridge University Press
DECC	Department of Energy and Climate Change
ECOSOC	United Nations Economic and Social Council
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EIA Directive	European Directive 2011/92/EU
EILR	Emory International Law Review
EJIL	European Journal of International Law
ELNI Rev	Environmental Law Network International Review
ELQ	Ecology Quarterly Law
ELVs	Emission Limits Values
EMPs	Environmental Management and Monitoring Plan
Env'tl Impact Assess Rev	Environmental Impact Assessment Review

Environmental Management in Oil and Gas Exploration and Production Guidelines	Environmental Management in Oil and Gas Exploration and Production Guidelines: An overview of issues and management approaches. Joint E&P Forum/ UNEP
EoE	Encyclopedia of Earth
ESPOO	Convention on Environmental Impact Assessment on Transboundary Context
EU ETS	European Emission Trading System
E&P Forum	Oil industry International Exploration and Production Forum
Foreign Aff	Foreign Affairs
FPSOs	Floating Production, Storage and Offloading Facilities
France – Canada Framework Agreement	Framework Agreement between Canada and the French Republic Relating to the Exploration and Exploitation of Transboundary Hydrocarbons Fields
FSUs	Floating Storage Units
G Wash L Rev	George Washington Law Review
Ga J Intl & Comp L	Georgia Journal International & Comparative Law
GAOR	General Assembly Official Records
Geo Intl Env'tl L Rev	Georgetown International Environmental Law Review
Global Bus & Dev LJ	Global Business & Development Law Journal
Göteborg Protocol	Protocol to Abate Acidification, Eutrophication and Ground-level Ozone
The Greater Sunrise International Unitization Agreement	Unitisation of the Sunrise and Troubadour Fields Agreement
HAIL	Hague Academy of International Law
Harv Hum Rts J	Harvard Human Rights Journal
Harv L Rev	Harvard Law Review
Hastings W-NW J Env'tl L & Pol'y	Hastings North-western Journal on Environmental Law & Policy
HEA	Holistic Environmental Assessment
Hous JL	Houston Journal of International Law
IACHR	Inter-American Commission on Human Rights

Iceland – Norway Framework Agreement	Framework Agreement between Iceland and Norway concerning Transboundary Hydrocarbon Deposits
ICCPR	International Covenant on Civil and Political Rights
ICGJ	International Courts of General Jurisdiction
ICJ	International Court of Justice
ICLQ	International & Comparative Law Quarterly
ICZMs	Integrated Coastal Zone Management
IDC	Inter-American Democratic Charter
IEA	International Energy Agency
IJECL	International Journal Estuarine & Coastal Law
IJMCL	International Journal of Marine and Coastal Law
ILA	International Law Association
ILC	International Law Commission
ILSA J Intl & Comp L	ILSA Journal of International & Comparative Law
IMO	International Maritime Organisation
IMO Convention	Convention on the International Maritime Organization
IMO Guidelines	Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone, IMO Guidelines and Standards
IMPRS	International Max Planck Research School
Intl L Related to Sust Develop Series	International Law Related to Sustainable Development Series
Intl & Comp LQ	International & Comparative Law Quarterly
IOCC	Interstate Oil and Gas Commission Charter
IOGCC	Interstate Oil and Gas Compact Commission
IOGC Model Statute	IOGCC Model Statute
IPC	Integrated Pollution Control
IPIECA	Global Oil and Gas Industry Association for Environmental and Social Issues
IPIECA Guidelines	Good Practice Guidelines for the Development of Shale Oil and Gas
IPPC	Integrated Pollution Prevention and Control
ISO	International Organisation for Standardization

ITLOS	International Tribunal for the Law of the Sea
JCR	Journal Coastal Research
JDAs	Joint Development Agreements
J Transnatl Law & Pol'y	Journal of Transnational Law & Policy
JERL	Journal Energy & Natural Resources Law
JIBL	Journal International & Business Law
JILIR	Journal of International Law & International Relations
JLREL	Journal of Land Resources and Environmental Law
JOLAS	Journal of Law and Administrative Science
Kan JL & Pub Pol'y	Kansas Journal of International Law and Public Policy
KLI	Kluwer Law International
Kyoto Protocol	Protocol to the UN Framework Convention on Climate Change
Land Eco	Land Economy
LCAs	Life Cycle Assessment
LIS	Limits in the Sea
Loran – Manatee Field Agreement	Unitisation Agreement between T&T – Venezuela for the Exploitation and Development of Hydrocarbon Reservoirs of the Loran-Manatee Field that extends along the Delimitation Line
Mar Pollut Bull	Marine Pollution Bulletin
MARPOL 73/78	Convention for the Prevention of Pollution from Ships
MLJ	McGill Law Journal
MEI	Middle East Institute
MEPEC	Marine Environment Protection Committee
Mich J Intl L	Michigan Journal of International Law
Montreal Protocol	Protocol on Substances that Deplete the Ozone Layer
MPEPIL	Max Planck Encyclopedia of Public International Law
MSP	Marine Spatial Planning
MULR	Melbourne University Law Review
MUNJ	Model United Nations Journal

Nat Res Forum	Natural Resources Forum
NCEA	Netherlands Commission for Environmental Assessment
NDL Rev	North Dakota Law Review
NED YIL	Netherlands Yearbook of International Law
NGO's	Nongovernmental Organizations
Nm	Nautical Mile
NMVOCs	Non – Methane Volatile Organic Compound
Nord JIL	Nordic Journal of International Law
NOx	Nitrogen Oxides
Norway – Russia Framework Agreement	Framework Treaty between Norway and the Russian Federation concerning Maritime Delimitation and Cooperation in the Barents Sea and the Arctic Ocean
Norwegian Petroleum Act	Petroleum Act 1996
NRJ	Natural Resources Journal
NRL	Natural Resources Law
NSDS	National Sustainable Development Strategy
NYL Forum	New York Law Forum
Nw J Intl L & Bus	North-western Journal of International Law & Business
OCD	Oil Conservation Division
OHCHR	Office of the High Commissioner on Human Rights
OCLJ	Ocean & Coastal Law Journal
OD and IL	Ocean Development and Ocean Law
OECD	Organisation for Economic Co-operation and Development
OGEL	Oil, Gas & Energy Law Journal
OJEC	Official Journal of the European Communities
OPRC	Convention on Oil Pollution Preparedness, Response and Co-operation
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
OUP	Oxford University Press
Paris Agreement	Paris Agreement adopted on the 21 st Conference of Parties within the Climate Change Convention

PCA	Permanent Court of Arbitration
Penn St Env'tl L Rev	Penn State Environmental Law Review
PDOs	Plan for Development and Operations
PPC Act	Pollution Prevention and Control Act 1999
PPP	Polluter Pays Principle
Río Declaration	Río Declaration 1992 on Environment and Development
RJL	Russia Journal of International Law
S Cal L Rev	Southern California Law Review
SDILJ	San Diego International Law Journal
SDLP	Sustainable Development Law & Policy
SDLR	San Diego Law Review
SEA	Strategic Environmental Assessment
SEA Directive	European Directive 2001/42/EC
SEMP	Safety and Environmental Management Program
SI	Statutory Instrument
SO ₂	Sulphur Dioxide
SPE	Society of Petroleum Engineers
SR	Statutory Rule
SSI	Scottish Statutory Instrument
Stockholm Convention	Stockholm Convention on Persistent Organic Pollutants
Stockholm Declaration	Stockholm Declaration on the Human Environment
Sw J Intl L	South western Journal of International Law
Tex Intl LJ	Texas International Law Journal
THRs	Transboundary Hydrocarbon Resources
Truman Proclamation	Policy of the United States with respect to the Natural Resources of the Subsoil and Seabed of the Continental Shelf
TSHA	Texas State Historical Association
T&T	Trinidad and Tobago
T&T – Venezuela Framework Agreement	Framework Treaty relating to the Unitization of Hydrocarbon Reservoirs that extend across the delimitation line between the Republic of T&T and the Bolivarian Republic of Venezuela
UDHR	Universal Declaration of Human Rights

UHCL	University of Houston Law Centre
UK	United Kingdom
UK – Norway Framework Agreement	Framework Agreement between the United Kingdom and Norway concerning Cross-Boundary Petroleum Co-operation
UK Petroleum Act	Petroleum Act 1998
U Kan L Rev	University of Kansas Law Review
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UN/DOALO	United Nations Office of Legal Affairs/Division for Ocean Affairs and the Law of the Sea
UNECE	United Nations Commission for Europe
UNEP	United Nations Environment Programme
UNEP Guidelines	Draft principles of Conduct for the Guidance of States in the Conservation and Harmonious Exploitation of Natural Resources Shared by Two or More States
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNGA	United Nations General Assembly
UNCLOS	United Nations Convention on the Law of the Sea
UN ESCAP	The United Nations Economic and Social Commission for Asia and the Pacific
UNPAN	United Nations Public Administration Network
UN Rep Intl Arb Awards	UN Report International Arbitral Awards
US	United States of America
US – Mexico Framework Agreement	Framework Agreement between the United States of America and Mexico on Transboundary Hydrocarbon Reservoirs in the Gulf of Mexico
Vand J Transnatl L	Vanderbilt Journal of Transnational Law
VJIL	Virginia Journal of International Law
Wash ILJ	George Washington International Law Review
Watercourses Convention	Convention on the Law of Non-navigational Uses of International Watercourses
World Heritage Convention	Convention concerning the Protection of the World Cultural and Natural Heritage

WGI Project

Whaling Convention

WJP

WSJ

YILC

Worldwide Governance Indicators Project

International Convention for the Regulation of
Whaling

World Justice Project

Wall Street Journal

Yearbook of the International Law Commission

Chapter 1. Conservation of Transboundary Hydrocarbon Resources: Progress and Prospects for the Future

1.1. Context

Petroleum resources provide valuable opportunities for economic, technical and social development.¹ As a result of the economic rent that can be obtained from petroleum exploitation and the scale and impact of such operations to the environment and society as a whole, these activities represent great and constant challenges for any State. These challenges can often be of political, regulatory, economical, technical, environmental and of social character. The extraction of petroleum generates numerous demands on a State, including the efficient and sustainable exploitation of resources, the holistic protection of the environment in which extraction occurs and areas beyond, and the health and safety of the personnel involved and of society as a whole. Most importantly to ensure how future generations reap the benefit of petroleum exploitation. The way States handle these critical challenges is decisive for its ability to achieve sustainable development of natural resources. Today it is necessary, or at least desirable for States to manage petroleum exploitation in a sound and long-term perspective. Nonetheless, as brilliantly described in Garret Hardin's "tragedy of the commons", to reconcile global and national sustainability objectives against the desire of petroleum companies to produce as much hydrocarbons as quickly as possible has been a constant dilemma. As evidenced throughout the thesis, the creation of legal frameworks, both at the municipal and international level, that foster the sustainability of petroleum development has proven to be an extremely complex and difficult activity. The development of natural resources to ensure sustainable economic development and social welfare for present and future generations has

¹ For the purpose of this study, the terms petroleum and oil and gas are used interchangeably. Petroleum, meaning "oil" and "natural gas" is a result of a natural geological process that generates hydrocarbons and associated non-hydrocarbons. Hydrocarbons consist of a range of molecules made up of carbon (C) and hydrogen (H) atoms. Due to its molecular composition, pressure and prevailing temperature, hydrocarbons may occur in a semi-solid, liquid or gaseous phase, described respectively as tar or asphalt, oil or natural gas. B Taverne, *'Petroleum, Industry and Governments: An Introduction to Petroleum Regulation, Economics and Government Policies'* (KLI 1999); Hydrocarbons are produced by a geological process sometimes called the "petroleum kitchen" whereby a slow chemical conversion of sediments rich in decayed plant and animal matter are buried into a source rock as a result of pressure from overlying strata that had gradually accumulated through erosion. O Anderson, 'Foreword: The Evolution of Oil and Gas Conservation Law and the Rise of Unconventional Hydrocarbon Production' (2014) 68 Ark L Rev 231, 243.

become an utmost global and shared responsibility, a priority and ongoing challenge for human development.

1.1.1. Defining Petroleum Conservation

Although the term petroleum conservation has no generally accepted definition, its core principles are without doubt closely aligned to sustainable practices. In the context of petroleum development, conservation refers to the optimal distribution of resource use over time; that is, the action to maximize the present value of the resource in such a way as to enhance society's overall economic, environmental and social welfare.² Its origins can be traced to the first major oil rush development during the early 1930s in the United States which led to a plethora of drilling rigs in a fearful race to extract oil as quick as possible. During such time, in 1935 the US Congress ratified an Interstate Compact to Conserve Oil and Gas, which still operates today, to enact one of the first pieces of legislation on significant principles of petroleum conservation. Article II of the Interstate Compact states its purpose as to "conserve oil and gas by the prevention of physical waste thereof from any cause."³ Although at its origins, petroleum conservation referred mainly to the avoidance of resource waste by unnecessary drilling, over time the definition widened to include the public interest at large. Beyond its original economic efficiency goal, in 1970 the Bank Of New York stated that petroleum conservation involved three things: "1. Squeezing the oil-bearing earth for maximum production over the long haul at minimum cost. 2. Bringing the oil above ground as fast as it is needed, and no faster. 3. Protecting the rights of everybody who has an interest in any part of an oil field: not just the biggest or the fastest or the most powerful."⁴ Under such description three core principles continue to be formulated in modern petroleum laws. Firstly, that petroleum conservation concerns maximizing recoverable reserves. When a petroleum field

² J Lang Weaver, *Unitization of Oil and Gas Fields in Texas, A Study of Legislative, Administrative, and Judicial Policies* (RFF Press 2011) vol 9, 6.

³ Whilst the Compact did not establish any legal obligations it created the IOGCC, which acted as a forum for state representatives to discuss matters concerning Oil Conservation. The IOGCC remains active today with 30 states party to the forum. IOGCC Charter (1935) <<http://iogcc.publishpath.com/charter>> accessed 14 August 2015. Some would argue that a similar oil rush began in recent years with the shale oil and gas revolution, particularly in the United States, which has only been curtailed by the fall in oil prices during 2015.

⁴ The Bank of New York, 'Petroleum Conservation - How America is Making the Most of its Oil and Gas Resources' (1970) 3 (2) NRL 272.

development fails to consider an optimal and efficient development plan, for the petroleum producers and operators, governments and society as a whole, this represents an unnecessary resource waste. Secondly, that petroleum conservation implies minimizing production costs to improve economic returns to the petroleum producers and operators, but at the same time to maximize government rent and reduce the overall supply cost, including unnecessary drilling, environmental degradation and pollution. Thirdly, that conservation recognizes the common interests associated to oil and gas production. Whilst the intent is that license holders to a common resource should fairly share the benefits of production, it also raises the notion of the larger public interest, including the need for a holistic environmental assessment and protection and the preservation of highly sensitive environmental areas from petroleum development, for example the Arctic Ocean. By stating that petroleum conservation is about “protecting the rights of everybody who has a legitimate interest” a wider reading of this text allows for the integration without doubt of environmental considerations within development projects as rightfully stated in Principle 4 of the Rio Declaration.

As evidenced in the following Chapters, there is a general consensus both within petroleum national laws and international instruments that oil and gas development has a significant economic, social, health, safety and environmental affect to the public interest. Onuosa goes further by arguing that petroleum conservation means “... developing petroleum in a manner that minimizes the depletion rate of reserves and maximizes the life of present and future generations.”⁵ Today the relationship between sustainable development and petroleum conservation is unquestionable. The term sustainable development plays a central role both in national laws and international instruments. The Brundtland Commission defined “sustainable development” as “development which meets the needs of the present without compromising the ability of the future generations to meet their own needs”⁶. Emphasizing the notions of fairness and intergenerational equity, the Commission recommended the concept of sustainable development as a guiding principle to governments and private

⁵ S Onuosa, ‘Sustainable Development of Petroleum Resources: The Rumpus and Resolution’, in Gao Z (ed), *Environmental Regulation of Oil and Gas* (KIL 1998) 436.

⁶ Report of World Commission on Environment and Development: Our Common Future (March 1987) to the UNGA as Annex to Doc A/42/427 (Brundtland Commission).

entities, encouraging all States and society to pursue legal frameworks and policies aimed at sound and sustainable development. The term sustainable development was rapidly reinforced to include three fundamental pillars –economic development, social development and environmental protection, and currently expanded to encompass seven principles contained in the ILA’s 2002 New Delhi Declaration of Principles of International Law that address Sustainable Development.⁷ The concept has since been supported by other institutions such as the World Energy Council which defined sustainability as “energy produced and used in ways that support human development over the long term, in all its social, economic and environmental dimensions”.⁸

As evidenced throughout the thesis, many petroleum laws have embraced sustainable development principles, including the recent principles mentioned in the New Delhi Declaration such as the precautionary approach, public participation and a system of good governance; a fundamental gluing element to achieve sustainable frameworks for petroleum development. For example, and perhaps the most comprehensive definition of petroleum conservation that ultimately meshes sustainable development goals with petroleum development, can be found under Article 4 of the Oil And Gas Conservation Act of Alberta, Canada which refers: “(a) to effect the conservation of, and to prevent the waste of, the oil and gas resources of Alberta; (b) to secure the observance of safe and efficient practices in the locating, spacing, drilling, equipping, constructing, completing, reworking, testing, operating, maintenance, repair, suspension and abandonment of wells and facilities and in operations for the production of oil and gas or the storage or disposal of substances; (c) to provide for the economic, orderly and efficient development in the public interest of the oil and gas resources of Alberta; (d) to afford each owner the opportunity of obtaining the owner’s share of the production of oil or gas from any pool; (e) to provide for the

⁷ In addition to the three basic pillars of sustainable development –economic, social and environment- there are seven principles contained in the ILA’s 2002 New Delhi Declaration of Principles of International Law that address Sustainable Development. These principles are: (1) the duty of States to ensure sustainable use of natural resources, (2) equity and the eradication of poverty, (3) common but differentiated responsibilities, (4) the precautionary approach, (5) public participation, (6) good governance, and (7) integration and interrelationship. To Duncan French the New Delhi Declaration “is arguably the most prominent text on the legal implications of sustainable development, despite its non-governmental nature.” D French, ‘From the Depths: Rich Pickings of Principles of Sustainable Development and General International Law on the Ocean Floor-the Seabed Disputes Chamber’s 2011 Advisory Opinion’ (2011) 26 IJMC 525, 537.

⁸ E Merino Blanco and J Razzaque, *Globalisation and Natural Resources Law Challenges, Key Issues and Perspectives* (Edward Elgar Publishing Inc 2011) 50, 51.

recording and the timely and useful dissemination of information regarding the oil and gas resources of Alberta; (f) to control pollution above, at or below the surface in the drilling of wells and in operations for the production of oil and gas and in other operations over which the Regulator has jurisdiction.”⁹

The above definition clearly translates into the pursuit of the three basic pillars of sustainable development both by oil companies and governments. As explained further by Tina Hunter in her PhD Thesis, first is economic development “measured in terms of revenue, earnings, and shareholder return, analogous to a State’s economic growth based on taxes, royalties, profit-sharing, revenue and access to domestic petroleum reserves to reduce import of petroleum. Secondly, ... environmental stewardship, measured in terms of increased energy efficiency, pollution reductions and mitigation projects. This is analogous to a State’s environmental goals for clean air water and land, and the preservations of valued ecological areas. Thirdly, it comprises social progress. For the corporation, this is measured in terms of community outreach, human rights and labour standards, and diversity in the workplace...”¹⁰ all paralleled to a number of social goals of many States.

Further, more and more petroleum conservation practices foresee a holistic approach to nature, whether at a national or international level, nowadays oil and gas practices must include a holistic assessment of the environment, including surrounding or other ecosystems, such as ground waters, marine life, climate etc. whilst applying best practice on social, health, safety and environmental matters. For example, ICZM aims to establish plans to maximize the benefits of the coast by taking a holistic view of all sector activities whilst minimizing harmful impacts upon the environment. ICZM is a form of environmental best practice based upon the concept of sustainability of the coastal environment which supports petroleum conservation. It is defined as the governance process which consists of the “legal and institutional framework necessary to ensure that development and management plans for coastal zones are integrated with environmental (including social) goals and are made with the

⁹ Oil and Gas Conservation Act, Alberta Regulation 151/1971, with amendments up to and including Regulation 114/2015 (current as of 29 March 2014) (Alberta Oil and Gas Conservation Act).

¹⁰ T Hunter, ‘Legal Regulatory Framework for the Sustainable Extraction of Australian Offshore Petroleum Resources; A Critical Functional Analysis’ (PhD Thesis, University of Bergen 2010) 24.

participation of those affected.¹¹ Petroleum conservation also contemplates the reduction of carbon dioxide from activities such as flaring, carbon sequestration¹² and the promotion of energy efficiency, particularly to upstream oil and gas activities in order to materially reduce carbon emissions; a petroleum conservation goal mainly driven by the Climate Change Convention, and as further evidenced in the recent Paris Agreement.¹³

Finally, petroleum conservation also includes the conversion of wealth generated from petroleum development into other forms of wealth for future generations. This conversion can be accomplished through the establishment of sovereign wealth funds and the investment of petroleum rent in human capital and social infrastructure, particularly to offset the loss of natural resources depletion. The fundamental question of how much of a State's petroleum resource should each generation consume, and how much should be retained in the ground for future generations continues to trouble policy and law makers. Although clearly petroleum conservation relates to the three basic pillars of sustainable development –economic, environmental and social, clarity on the delicate balance between economic efficiency, environmental protection and social equality has become a global ongoing challenge.¹⁴

¹¹ J Post, C Lundin and World Bank, *Guidelines for Integrated Coastal Zone Management* (The World Bank 1996).

¹² Since 2006 the New Mexico Energy, Minerals, and Natural Resources Department's Oil Conservation Division has sought ways to reduce carbon emissions in oil and gas operations including the use of carbon sequestration technologies. In 2013 the division approved an enhanced oil recovery process from Occidental Permian Limited Partnership to inject water, CO₂ and produced gases into the South Hobbs Grayburg-San Andres Pressure Maintenance Project after taking a holistic review of matters including the impact on fresh water sources in the area. See Holland & Hart, 'Carbon Sequestration Update on National and Western State Activities' (November 2007) <<https://www.hollandhart.com/files/CarbonSequestration.pdf>> accessed 20 November 2015; Minutes Of The Meeting Of The Oil Conservation Commission Held On May 9-10 2013, New Mexico OCD <<http://www.emnrd.state.nm.us/OCD/documents/May9ComMin.pdf>> accessed 20 November 2015

¹³ The 2015 Paris Agreement, adopted in Paris on 12 December 2015, marks the latest step in the evolution of the UN climate change regime and builds on the work undertaken under the Climate Change Convention. The Paris Agreement charts a new course in the global effort to combat climate change. On 5 October 2016, the threshold for entry into force of the Paris Agreement was achieved (105 Parties have ratified of 197 Parties to the Convention). The Paris Agreement entered into force on 4 November 2016, thirty days after the date on which at least 55 Parties to the Convention accounting in total for at least an estimated 55 % of the total global greenhouse gas emissions have deposited their instruments of ratification, acceptance, approval or accession with the Depositary. Further, relevant to the sustainable development of resources, under Article 7.9. (e) of the Paris Agreement, each Party shall, as appropriate, engage in "building the resilience of socioeconomic and ecological systems, including through economic diversification and sustainable management of natural resources." Paris Agreement, adopted at the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (adopted 12 December 2015, entered into force 4 November 2016) < https://treaties.un.org/doc/Treaties/2016/02/20160215%2006-03%20PM/Ch_XXVII-7-d.pdf>

¹⁴ See, for example, R Solow, 'On the Intergenerational Allocation of Natural Resources' (1986) 88 (1) *Scandinavian J of Economics* 141. Also see N Schrijver, *The Evolution of Sustainable Development in International Law: Inception, Meaning and Status and Statu aagfd Status* (Pocket Books of HAIL, Martinus Nijhoff Publishers 2008) vol 2, 220.

1.1.2. Application of Petroleum Conservation to THRs

The development of natural resources is governed by the principle of permanent sovereignty. Enshrined in 1962 the doctrine provides each State the right to “freely” dispose of its “natural wealth and resources in accordance with its national interests, and on respect for the economic independence of States.”¹⁵ Under such doctrine it is clear that States have the sovereign right to develop the natural resources within their territory, however, this raises the question as to how this applies to natural resources that migrate across boundaries, and furthermore how does the development of transboundary resources attains sustainable development. Recourse may be held to the *Gabcikovo-Nagymaros Project*, where the ICJ noted that relevant principles of international environmental law and the objective of sustainable development could be reasonably imputed to bilateral relations.¹⁶ Unfortunately, the development of petroleum resources have often evolved only upon activities and operations within artificial political boundaries. Natural resources do not obey political demarcations or artificial boundaries. The migratory nature of oil and gas contained in geologic structures “do not conform to property lines, licensing demarcations, or political boundaries.”¹⁷ Even where oil and gas reservoirs do not cross partially or entirely such political demarcations they may be sufficiently close to migrate across boundaries. This is particularly the case during the development and production phases of a petroleum project when hydrocarbons are being produced and the extraction process reduces pressure at the well and causes migration of hydrocarbons from other areas of high pressure to the low pressure area around the well. The *problematique* was brilliantly illustrated by Langoni whereby transboundary deposits are characterized by a complicated composition of rock pressure, gas pressure and underlying water pressure, so that extracting petroleum at one point unavoidably changes conditions in the whole deposit. Consequently, unilateral extraction of the resources is not permitted, even if the State has extracted only that portion originally situated in its territory or

¹⁵ Permanent Sovereignty over Natural Resources, UNGA Res 1.803(XVII) (11 December 1962) UN Doc A/Res/29/1803.

¹⁶ *Gabcikovo-Nagymaros Project (Hungary/Slovakia)* Judgment (25 September 1997) ICJ Rep 1997. Also see D Ong, “Towards an International Law for the Conservation of Offshore Hydrocarbon Resources within the Continental Shelf?” in Freestone D and others (eds), *The Law of the Sea: Progress and Prospects* (OUP 2006) 11.

¹⁷ A Utton, ‘Institutional Arrangements for Developing North Sea Oil and Gas’ (1968-1969) 9 VJIL 66, 70.

continental shelf. Further, without full knowledge of the geological characteristics of the whole common deposit, no State can determine whether he has suffered material damage from unilateral exploitation of the common deposit and what the amount of such damage might be.¹⁸

Often by obeying the artificial political boundaries rather than the geological characteristics of a common reservoir conflicts with petroleum conservation principles arise. The associated duplication of infrastructure increases both economic costs and environment degradation, including surface and underground damage and air and ground pollution. Competition to extract as much oil and gas as quickly as possible between operating companies on either side of the boundary generates sub-optimal production likely to reduce total oil and gas recoverable ratios and produce unnecessary resource waste.¹⁹ This was clearly evidenced in the first US major oil rush development during the early 1930s, whereby the negative aspects of the rule of capture led to recognition of the doctrine of correlative rights²⁰ and the incorporation of early oil conservation principles such as well-spacing regulation to limit the number of wells that could be drilled in a given area.²¹ Over time more modern practices involved voluntary cooperation among adjacent title-holders of a common reservoir to minimize economic and physical waste that would otherwise result. However, as mere voluntary cooperation was not enough it was necessary to establish a “administrative structure and legal framework for developing divided petrolific pools as a unit”.²² Solutions such as mandatory pooling and unitization were widely developed in petroleum laws and are frequently applied to THRs in

¹⁸ Lagoni referring to Ely, ‘The Conservation of Oil’ (1937-1938) 51 Harv L Rev 1209, 1219, R Lagoni, ‘Oil and Gas Deposits Across National Frontiers’ (1979) 73 AJIL 215, 217.

¹⁹ In most cases primary recovery (i.e., natural depletion of reservoir pressure) has a recovery factor under 20%. Secondary recovery which relies on either natural or artificial water or gas injection has an incremental recovery ranges from 15 to 25%. Globally, the overall recovery factors for combined primary and secondary recovery range between 35 and 45%. For further see P Zitha and others, ‘Increasing Hydrocarbon Recovery Factors’ (2011) SPE Technology Updates <<http://www.spe.org/industry/increasing-hydrocarbon-recovery-factors.php>> accessed 10 November 2015

²⁰ In *Elliff v. Texon Drilling Company* 210 S.W.2d 558 (Tex 1948) negligence of Texon resulted in a blowout which drained oil and gas from the neighboring land of Elliff who sued for damages for lost oil and gas reserves. Texon based its defense upon the rule of capture but the Texas Supreme Court rejected the defense referring to the correlative rights doctrine stating that the right to take oil and gas from the property of another under the rule of capture does not apply when the removal of the oil or gas is done negligently or wastefully.

²¹ Utton (n 17) 70.

²² *ibid* 69.

international arrangements.²³ Furthermore a system of good governance was progressively implemented to oversee conservation practices. Currently the principle of “good governance” plays a key role in the implementation of conservation principles, both at the municipal and international level. Chowdhury perceives good governance “as a normative principle of administrative law, which obliges the State to perform its function in a manner that promotes the values of efficiency, non-corruptibility, and responsiveness to civil society.”²⁴ Good governance is now widely viewed as an essential element of the concept of sustainable development and its implementation. As described in Article 9 of the Cotonou Partnership Agreement, governance has become the much needed transparent and accountable management of human, economic and natural resources for the purposes of equitable and sustainable development. However, as discussed in Chapter 4 below, the inclusion of a comprehensive governance framework for the sustainable development of THRs is still very much debated.

1.1.3. Framework Agreements for the Development of THRs

Despite the historical efforts to put in place international cooperative arrangements and principles for the development of THRs, conflicts and political tensions between States continue to arise. For example, recently when ExxonMobil announced a large commercial discovery at its Liza-1 well in the Stabroek Block offshore Guyana in 2015 the Venezuelan government responded by issuing a decree claiming most of Guyana’s territorial waters along the Guayana Esequiba coastline, an area administered by Guyana but subject to a long running territorial dispute with Venezuela. Whilst the dispute arose because of a sovereignty dispute over the territory the trigger which raised political tensions and which led the United Nations to become involved as an intermediary was the discovery of oil and the lack of clarity on the legal principles applicable to THRs.²⁵

²³ See, for example, A Bastida and others, ‘Cross-Border Utilization and Joint Development Agreements: An International Law Perspective’ (2006-2007) 29 *Hous J Intl L* 356; G Leary, ‘Compulsory Unitization-The Answer to Oil and Gas Conservation?’ (1960) 7 *UCLA L Rev* 312.

²⁴ Schrijver (n 14) 201.

²⁵ See Stabroek News, ‘Granger meets UN team on Venezuela border controversy’

<<http://www.stabroeknews.com/2015/news/stories/08/31/granger-meets-un-team-on-venezuela-border-controversy/>> accessed 19 September 2015

As recently confirmed by the Arbitral Tribunal in the Eritrea-Yemen Arbitration, Phase II-Maritime Delimitation, unilateral development of THRs is often considered a breach of international law.²⁶ Instead States interested in such a deposit are therefore under an obligation to pursue an alternative, cooperative route to development.²⁷ Historically this duty to cooperate has resulted in some States agreeing bilateral treaties to establish a legal framework for THRs development. Whilst initial treaties focused on particular well-defined fields²⁸ later arrangements known as JDAs and International Unitization Agreements²⁹ took a wider view to development. Low defines JDAs as “agreements between States in which the parties set out the basis for cooperation to explore for and develop petroleum resources within a geographically defined zone where both parties claim to have exclusive sovereign rights.”³⁰ On the other hand, International unitization takes place only when a specific defined reservoir straddles the delimited boundaries of two or more States. International unitization differs from JDAs as unitization normally takes place when hydrocarbon resources have been discovered in an area that already has a defined maritime boundary or other defined demarcation and one or more specific deposits straddle such boundaries. Despite its long and successful history of JDAs and International Unitization Agreements in international law, recently States have adopted a practice to reach more comprehensive and elaborated frameworks for the recognition and development of THRs. International Framework Agreements are the latest form of international bilateral arrangements seeking to provide an

²⁶ The Arbitral Tribunal in the *Eritrea-Yemen Arbitration*, Phase II-Maritime Delimitation (17 December 1999) 40 ILM 938: confirmed this view by having regard to the maritime boundary established by this Award, that the Parties “are bound to inform one another and to consult one another on any oil and gas and other mineral resources that may be discovered that straddle the single maritime boundary between them or that lie in its immediate vicinity”. G Triggs, ‘The Timor Sea Treaty and the International Unitization Agreement for Greater Sunrise: Practical Solutions in the Timor Sea’ (2004) 23 Aust YBIL 161, 166.

²⁷ Refer to Chapter 3 Sections 3.2.3. Duty to Cooperate for the Development of THRs and 3.2.3.3. Unilateral Action.

²⁸ For example the Agreement between the Government of the Kingdom of Norway and the Government of the Kingdom of Great Britain and Northern Ireland relating to the Exploitation of the Frigg Field Reservoir and the Transmission of Gas therefrom to United Kingdom (16 October 1979) 1249 UNTS 173; Agreement between the United Kingdom of Great Britain and Northern Ireland and the Kingdom of the Netherlands Relating to the Exploitation of the Markham Field Reservoirs and the Offtake of Petroleum therefrom (26 May 1992) 499 UNTS 311.

²⁹ Unitization is “the joint, coordinated operation of an oil or gas reservoir by all the owners of rights in the separate tracts overlying the reservoir or reservoirs.” J Weaver and D Asmus, ‘Unitizing Oil and Gas Fields Around The World: A Comparative Analysis of National Laws and private Contracts’ (2006) 28 UHLC 3, 12. Also see J Biang, ‘The Joint Development Zone between Nigeria and Sao Tome and Principe: a case of Provisional Arrangement in the Gulf of Guinea, International Law, State Practice and Prospects for Regional Integration’ (2010) UN/DOALOS 3.

³⁰ C Low, ‘Marine Environmental Protection in Joint Development Agreements’ (2012) 30 JERL 45, 58.

overreaching legal framework for the joint recognition and development of transboundary hydrocarbons.

International Framework Agreements cover subjects beyond traditional JDAs and International Unitization Agreements. These modern treaties contain an adaptive governance framework establishing broad and general obligations that are regulated by the creation of a plenary organ which is provided powers of oversight and which, through the use of subsidiary bodies, develops the applicable framework for the recognition and development of THRs. These agreements usually cover a series of complex matters including resource allocation, development plan approval, decommissioning, fiscal rules, health, safety and environmental regulations, interconnectivity with existing infrastructure, governance, and unitization.³¹ These international arrangements are normally driven by five cooperative goals: (1) to prevent economic waste as there is no need for competitive drilling and construction of more than the necessary facilities; (2) to allow sharing of development infrastructures with the benefit of lowering the cost of production and supply; (3) to maximize the ultimate recovery of petroleum in the field, whether during primary or enhanced production operations; (4) to give all the owners of rights in the common deposit a fair share of the production; and (5) to minimize use and damage of the surface or seabed by avoiding unnecessary wells and infrastructure.³² Although many of these cooperative advantages are closely aligned with conservation practices also found in numerous JDAs and International Unitization Agreements, the central notion of sustainable development and good governance is heavily embedded throughout the agreements. International framework agreements have become very popular among petroleum producing States. Particularly in the Americas, where the most detailed agreements have been executed, Framework Agreements represent a fresh and credible option to foster sustainable development of transboundary petroleum resources at a large scale. For such reasons, and although constant reference is made to the great value of JDAs and International Unitization Agreements in international law, the scope of the thesis is limited to the

³¹ Unitization requires where there are multiple licensees of an oil or gas reservoir to operate the reservoir as if the reservoir were owned by a single licensee and name one of the licensees as the Unit Operator.

³² K Urdaneta, 'Transboundary Petroleum Reservoirs: A Recommended Approach For the United States and Mexico in the Deepwaters of the Gulf of Mexico' (2009-2010) 32 *Hous J Intl L* 333, 380.

examination of all the international framework agreements executed to date, from the first framework agreement executed between UK and Norway in 2005 to latest US-Mexico Framework Agreement executed in 2014. In addition, such selection was also influenced by the petroleum development potential that framework agreements currently have, its geographical location, the sensitive environmental areas covered by such agreements, and the long and significant history of the petroleum laws produced by the States to such agreements and their implicit influenced to the global oil and gas industry.

As the era of easy oil comes to an end, the role THRs play in meeting global demand for hydrocarbons is more relevant than ever.³³ Currently 60% of the world's known oil and gas reserves either lie across defined international boundaries or are found in contested regions.³⁴ There is not a single hydrocarbon-producing area that does not face transboundary development issues.³⁵ Further, as often the case for the Caribbean Sea Region, to a number of States THRs represent their only access to hydrocarbons. Technology has taken development to areas unthinkable 10 years ago, both onshore and offshore.³⁶ To this global energy challenge, there is no doubt that States require the urgent incorporation of

³³ The US - Mexico Framework Agreement allows oil and gas development over 1.5 million acres that were previously off-limits because of border issues. The extent of the contemplated incremental production will allow Mexico to double its estimated 10.5 billion barrels of proven oil reserves. See Preamble to the Agreement between the United States of America and Mexico on Transboundary Hydrocarbon Reservoirs in the Gulf of Mexico (adopted 20 February 2012, entered into force 18 July 2014) text registered with the UN No. 52496 (US - Mexico Framework Agreement) 3.

³⁴ According to the International Energy Agency 60% of the world's known oil & gas reserves either lie across defined international boundaries or are found in contested regions. Unfortunately there are no exact figures on the number of -oil barrels equivalent- that either lie across delimited international boundaries or are found in contested areas. World Energy Investment Outlook 2014, IEA (OECD/IEA 2014) 38.

³⁵ Fox provides a summary of the regions affected by transboundary hydrocarbons. H Fox (ed), *Joint Development of Offshore Oil and Gas - A Model Agreement For States for Joint Development with Explanatory Commentary* (BIICL 1989) I, 54.

³⁶ In 2014, about 89% of the energy that the world consumed came from hydrocarbons, a figure unchanged from 10 years ago. Globally, natural gas usage is expected to rise by more than 50% compared to 2010 levels, and account for over 25% of the world's energy demand by 2035. R Matt, 'Fossil Fuels Will Save the World (Really)' *WSJ* (London, 13 March 2015).

Hydraulic fracturing (also hydrofracturing, hydrofracking, fracking or facing), is a well-stimulation technique in which rock is fractured by a hydraulically pressurized liquid made of water, sand, and chemicals. A high-pressure fluid (usually chemicals and sand suspended in water) is injected into a wellbore to create cracks in the deep-rock formations through which natural gas, petroleum, and brine will flow more freely. As of 2014, 3.5 million "frac jobs" had been performed worldwide on oil and gas wells; over two million of those within the U.S. Hydraulic fracturing is highly controversial; whereas its proponents advocate the economic benefits of more extensively accessible hydrocarbons, opponents argue that the environmental impacts of fracking include the risks of contaminating ground water, depleting fresh water, degrading air quality, potentially triggering earthquakes, noise pollution, surface pollution, and the consequential hazards to public health and the environment. For these reasons, hydraulic fracturing is under international scrutiny, restricted in some countries, and banned altogether in others. Some of the countries that have banned the practice, notably the U.K., contemplated repeal of bans on hydraulic fracturing in favour of regulation. The European Union is drafting regulations that would permit controlled application of hydraulic fracturing.

petroleum conservation principles and good governance in both national petroleum laws and international treaties.³⁷

1.2. Research Questions

The thesis is built around the application of conservation principles within recent international framework agreements for the recognition and development of offshore THRs. Two major questions are developed:

1. Do international framework agreements effectively apply petroleum conservation principles?

2. Do international framework agreements provide consistent and uniform practices to enhance transboundary hydrocarbon conservation, and based upon this suggest how future international instruments should be developed?

1.3. Methodology

This thesis deploys a doctrinal approach. The doctrinal method is used to examine how international law in general and particularly recent international framework agreements embrace petroleum conservation principles for the development of offshore THRs. This work attempts to identify, analyse and synthesise the legal content regarding petroleum conservation in international framework agreements.

³⁷ Consumption of energy in 2060 could be at least twice as high as it is today. According to the World Bank the main drivers will be population growth and higher income. It is estimated that the world's population could easily reach 9 billion by the middle of this century, which will hopefully translate into greater economic growth and hence higher demand for energy. To provide an idea of the speed of development: after 60 years of prosperity, today there are 46 million cars in Germany. In China today there are 40 million cars, that is 3 for every 100 people. By 2025, the forecast is that China will have 150 million cars. Fuelling these cars will require an additional 2-3 million barrels of oil per day, equivalent to the current demand of South Korea. If China follows the development path of South Korea, China's energy consumption will be double that of today by 2025. Some estimates have China consuming 16% of the world's primary energy by 2025. New Lens Scenarios, Shell Global (Shell, March 2013) 23
<<http://www.shell.com/content/dam/royaldutchshell/documents/corporate/scenariosnewdoc.dfs>> accessed 20 February 2016

The following International Framework Agreements³⁸ are examined:

1. Framework Agreement between the United Kingdom and Norway concerning Cross-Boundary Petroleum Co-operation³⁹ along with the supplemented Joint Guidelines for Development of Trans-boundary Oil and Gas Fields.⁴⁰

2. Framework Agreement between Canada and the French Republic Relating to the Exploration and Exploitation of Transboundary Hydrocarbon Fields.⁴¹

3. Framework Agreement relating to the Unitization of Hydrocarbon Reservoirs that extend across the delimitation line between the Republic of Trinidad and Tobago and the Bolivarian Republic of Venezuela⁴² and as a result of such Framework Agreement the reservoir-specific agreement for the Unitization Agreement for the Exploitation and Development of hydrocarbon reservoirs of the Loran-Manatee field that extends across the delimitation line.⁴³

4. Framework Agreement between Iceland and Norway Concerning Transboundary Hydrocarbon Deposits.⁴⁴

5. Framework Treaty between Norway and the Russian Federation concerning Maritime Delimitation and Cooperation in the Barents Sea and Arctic

³⁸ For the purpose of this study, together the framework agreements are referred to as “Framework Agreements”.

³⁹ (adopted 4 April 2005, entered into force 10 July 2007) text registered with the UN No. 44682 (UK – Norway Framework Agreement).

⁴⁰ Available at the UK Department of Energy and Climate Change website

<https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/15574/nor-guide.pdf> accessed 17 September 2015

⁴¹ (adopted 18 July 2007) Rapport n° 395 (2006 – 2007) (France - Canada Framework Agreement). Not yet in force and unpublished. The Agreement enters into force (Article 21) following notification that all necessary internal requirements have been fulfilled.

⁴² (adopted 20 March 2007, entered into force 16 August 2010) text registered with the UN No. 50195 (T&T - Venezuela Framework Agreement).

⁴³ (adopted 16 August 2010) ST/LEG/SER.A/789 text registered with the UN No. 50197 (Loran – Mantee Field Agreement).

⁴⁴ (adopted 3 November 2008, entered into force 3 October 2011) text registered with the UN No. 50378 (Iceland – Norway Framework Agreement).

Ocean and its attached Annex II dealing with Transboundary Hydrocarbon Deposits.⁴⁵

6. Framework Agreement between the United States and the United Mexican States Concerning Transboundary Hydrocarbon Reservoirs in the Gulf of Mexico.⁴⁶

Relevant provisions of petroleum municipal laws, municipal case law, international jurisprudence, JDAs, international unitization agreements, treaties and other international agreements and instruments governing petroleum conservation and sustainability are also examined under a doctrinal method.

1.4. Aims of the Thesis

The increasing practice for international framework agreements, and the further consolidation of sustainable development in international law, provides a unique opportunity to revisit development of THRs under conservation principles. The aim of the thesis is to study the relationship between the development of offshore THRs in recent international framework agreements and the application of petroleum conservation principles and its impact to sustainable development. The work is built around the concept of petroleum conservation. It seeks to determine whether the application of petroleum conservation principles in recent international framework agreements provides uniform and consistent practices. It highlights the challenges that petroleum conservation faces and provides an outlook for its progress in international law.

It does not, however, examine the rights and duties of States in maritime areas of overlapping claims nor the rights of States to exploit resources that lie across the International Area and limits of national jurisdiction. Also it does not examine prorationing rules to limit the rate of production by governments⁴⁷ nor

⁴⁵ (adopted 15 September 2010, entered into force 7 July 2011) text registered with the UN No. 49095 (Norway-Russia Framework Agreement). The treaty was concluded in Norwegian and Russian. An English translation is available at <http://www.regjeringen.no/upload/ud/vedlegg/folkerett/avtale_engelsk.pdf> accessed 16 September 2015

⁴⁶ (adopted 20 February 2012, entered into force 18 July 2014) text registered with the UN No. 52496 (US – Mexico Framework Agreement).

⁴⁷ Prorationing of petroleum occurs when a regulator restricts the amount of oil and gas produced from a pool or pools by determining the market demand for oil and gas within a pipeline or pipelines and by allocating market demand in a

OPEC resolutions to overall increase or reduce petroleum production by OPECs member states. Further it is not intended to provide an exhaustive study of sustainable development in international law. Reference to sustainable development principles is made only to highlight common features and its impact to reduce legal uncertainties when defining petroleum conservation measures in international law.

It does offer an original contribution to knowledge by providing a fresh look at the study of offshore THR's under conservation principles. This thesis provides a strong impetus for the recognition, application and advancement of petroleum conservation principles in international law. It highlights the need to further incorporate petroleum conservation into international discussions on sustainability.

1.5. Structure of the Thesis

Following this introductory section, there are four more chapters and a conclusion. Chapters 2 and 3 underlie the basic concepts and principles of petroleum conservation in municipal and international law. Chapter 4 and 5 provide an outlook on how petroleum conservation principles are applied under recent international framework agreements.

Chapter 2: Petroleum Conservation begins underground. From the Law of Capture to Efficient Development.

This Chapter describes the evolution of oil and gas conservation practices from a municipal law perspective. As a starting point to the study of petroleum conservation and in order to determine whether uniform practices exist, it examines petroleum conservation in the context of prevention of waste, recognition of correlative rights,⁴⁸ protection of the environment and the influence

reasonable manner among the fields or group of fields supplying the pipeline or pipelines for the purpose of providing each well owner the opportunity of producing or receiving a just and equitable share of the hydrocarbons in the pool or pools. art. 34 (1) of the Alberta Oil and Gas Conservation Act.

⁴⁸ In the law governing gas and oil development, a correlative right is the opportunity of each owner of land making up part of a common source of supply of oil and gas to produce an equitable share of such products. In the law governing water rights, the correlative rights doctrine gives the individual owners of land overlying a strata of percolating waters limited rights to use the water reasonably when there is not enough water to meet the needs of everyone in the area. Outside of the US petroleum resources in most producing States are owned by the host-government, not by private individuals or entities. In the US, development rights are granted by an oil and gas lease, and the oil company, or grantee, is commonly called the

of environmental law principles in oil and gas development. All of significant relevance for the formulation of sustainable development frameworks. In addition, a brief summary of early US conservation practices is provided. It addresses the nature of the different oil and gas ownership theories, its legal effects on the law of capture and how the recognition of the doctrine of correlative rights diminished wasteful practices. It also looks at modern conservation practices such as enhanced recovery, compulsory pooling and fieldwide unitization. It includes a technical study for the apportionment of oil and gas reserves and how statutory conservation encourages the efficient development of hydrocarbon resources. Finally, current trends and common features in municipal petroleum conservation laws and regulations are provided. Relevant to the examination of Framework Agreements, a survey of the petroleum municipal laws and regulations of Norway, UK and T&T⁴⁹ is included. The survey is limited to the identification of general concepts and principles as a basis for the further study of THRs under international law. The objective is to highlight common conservation practices and how global sustainability concerns are incorporated, and upon which further codification may be predicted.

Chapter 3: Internationalization of Transboundary Hydrocarbon Resources

This chapter analyses the joint development of THRs under international law. It begins by examining the purpose of joint development in what concerns the adoption of conservation measures, such as unitization. It provides an assessment of the rights of coastal States to explore and exploit THRs within defined boundaries. Essentially it examines whether treaty practice produced by joint development agreements thus far is sufficiently consistent and uniform and what legal assumptions can be drawn regarding petroleum conservation measures. It also examines the internationalization of shared natural resources. It looks specifically at the UNEP Guidelines and the UN Resolutions governing shared natural resources and its impact to THRs. It further provides a general summary of the relevant principles of sustainable development and how they promote the

lessee or leaseholders (license holders in British parlance). Outside of the US, the company granted contractual development rights by host governments is typically called the licensee, contractor, or concessionaire. Weaver and Asmus (n29) 7.

⁴⁹ Norway, UK and T&T extensive experience in negotiating THRs is relevant to the scope of our study.

conservation of THRs, whether directly or indirectly. Finally, it reviews the different attempts to propose universal rules and to standardize State practice concerning THRs. It looks at the work of the ILC regarding THRs, the work of the BIICL and the initiatives from scholars to standardize practice and implement universal rules. The overall purpose of the Chapter is to examine the legal framework applicable to offshore THRs, taking into consideration all rules and principles, whether hard or soft law, provided in international law that directly or indirectly promote conservation of THRs.

Chapter 4: Do Framework Agreements Effectively Apply Petroleum Conservation Principles?

Recent definitions of hydrocarbon conservation include not only the sustainable development of oil and gas reserves by maximizing reservoir production and minimizing project costs, but also by applying and enforcing best governance practices to ensure the rule of law on social, health, safety and environmental matters. As discussed, good governance in petroleum conservation enhances effectiveness, increases legitimacy and compliance to ensure overall welfare. Governance in the development of THRs creates a system of “check and balances” between States for inter-governmental coordination and cooperation. This Chapter sets out to review Framework Agreements decision-making institutions and their role on petroleum conservation matters. The Chapter focuses on three common governance themes: accountability, transparency and the application of the rule of law. It concludes by outlining the general governance format of the framework agreements and provides an opinion on whether conservation of THRs is governed effectively.

Chapter 5: How do Framework Agreements Incorporate Petroleum Conservation Principles of Environmental Assessment and Protection?

Petroleum conservation promotes sustainable economic growth and infrastructure rationalization, whilst applying best practice on social and environmental matters. However, doing this where there is a multi-layer of potential conflicting laws, guidelines and industry practice is complex. This Chapter briefly examines the principles of international environmental law

applicable to offshore oil and gas operations. It focuses on the study of principles and industry guidelines for assessing and minimizing environmental impact. It then reviews whether environmental provisions within framework agreements enhance petroleum conservation principles.

Chapter 6: Conclusions and Outlook for the Progress of Petroleum Conservation Principles in International Law

This Chapter provides general conclusions on how recent framework agreements apply petroleum conservation principles. It highlights the challenges that petroleum conservation faces and provides an outlook for its progress in international law.

The question as to whether Framework Agreements effectively apply petroleum conservation principles remains. The further incorporation of petroleum conservation is equally necessary in petroleum laws and international instruments. The overall benefits to private petroleum companies and operators, governments and society as a whole for the effective application of petroleum conservation principles are significant. As exemplified in the following Chapters, the application of petroleum conservation principles for the development of THRs would not only foster sound and sustainable development at a large scale, including the fundamental goal to lower carbon emissions as stated in the recent Paris Agreement, but also reduce potential conflicts and political tensions to promote lasting peace and stability among States; the heart and soul of international law. “Owners of a common source of supply necessarily stand in a special relationship to one another to the extent that unrestricted production by one inevitably has adverse effects on the economic welfare of the others.”⁵⁰

⁵⁰ D Ong, ‘Joint Development of Common Offshore Oil and Gas Deposits: “Mere” State Practice or Customary International Law’ (1999) 93 AJIL 771, 774. Also see, for example Lagoni (n 18) 224.

Chapter 2. Petroleum Conservation begins underground. From the Law of Capture to Efficient Development.

2.1. Introduction

Conservation of hydrocarbons continues to provide a number of complex legal questions both at the municipal and international level. The need to address conservation principles that comply with current social, economic and environmental standards both at the municipal and international level has become an ongoing challenge. Discussions around petroleum development have intensified. As the era of “easy oil” ends, the development of THRs represent both an opportunity to meet energy demand, but also a great social and environmental challenge. Current petroleum development often defies conservation principles.¹ As discussed, the sound and sustainable development of THRs, particularly in highly sensitive environmental areas, many fundamental for the well-being of mankind, is nowadays critical. The question of what kind of conservation practices should serve as a universal model for petroleum development has become more apparent than ever. To such end, this Chapter focuses on the evolution of petroleum conservation practices from a municipal law perspective. It does so by examining the context of prevention of waste, recognition of correlative rights,² protection of nature and the influence of environmental law principles in current oil and gas development. All of relevant importance to determine whether uniform conservation practices exist. In addition, being the US a mayor oil and gas producer it is also of great value to highlight how early US court litigation and

¹ New technologies in seismic data acquisition and directional drilling have taken offshore petroleum exploitation to unthinkable areas.

² In the law governing gas and oil development, a correlative right is the opportunity of each owner of land making up part of a common source of supply of oil and gas to produce an equitable share of such products. In the law governing water rights, the correlative rights doctrine gives the individual owners of land overlying a strata of percolating waters limited rights to use the water reasonably when there is not enough water to meet the needs of everyone in the area. Outside of the US petroleum resources in most producing States are owned by the host-government, not by private individuals or entities. In the US, development rights are granted by an oil and gas lease, and the oil company, or grantee, is commonly called the lessee or leaseholders (license holders in British parlance). Outside of the US, the company granted contractual development rights by host governments is typically called the licensee, contractor, or concessionaire. J Weaver and D Asmus, ‘Unitizing Oil and Gas Fields Around The World: A Comparative Analysis of National Laws and private Contracts’ (2006) 28 UHLC 3, 7.

conservation institutions contributed to shape modern petroleum conservation practices not only within the US but worldwide; many embedded today in municipal petroleum laws and major oil and gas concessions and licenses. Technical references to the physical nature of oil and gas reservoirs,³ its extraction and production methods, and its basis for apportionment are also embedded across the Chapter. As a starting point to understand how petroleum conservation must operate an analysis that includes the technical characterization of reservoirs is albeit necessary. The migratory nature of oil and gas, the permeability characteristics of the reservoir, the location of the wells and the rate of production of hydrocarbons among other technical aspects are all of particular importance when defining conservation practices.⁴

Accordingly, a brief summary of early conservation laws is provided in Part II. It addresses the nature of the different oil and gas ownership theories. Also characterized are the legal effects of the law of capture and how the recognition of the doctrine of correlative rights diminished wasteful practices. Part III looks at modern conservations practices such as enhanced recovery, compulsory pooling and fieldwide unitization and its legal effects. It includes a technical basis for the apportionment of oil and gas reserves and how statutory conservation encourages the sustainable development of hydrocarbons. Finally, current trends and common features in municipal conservation laws and regulations are provided in Part IV. Relevant to the study of recent Framework Agreements a survey of the petroleum laws and regulations of Norway, UK and T&T⁵ is included. The survey is limited to the identification of general concepts and principles as a basis for the further study of THRs under international law. Its objective is to highlight common conservation

³ The Schlumberger Oilfield Glossary defines "Geology" as follows:

Pertaining to geology, the study of the Earth-its history, structure, composition, life forms and the processes that continue to change it.

<<http://www.glossary.oilfield.slb.com/en/Terms/g/geological.aspx>> accessed 1 February 2016

The Schlumberger Oilfield Glossary defines "Geophysics" as follows:

"The study of the physics of the Earth, especially its electrical, gravitational and magnetic fields and propagation of elastic (seismic) waves within it. Geophysics plays a critical role in the petroleum industry because geophysical data are used by exploration and development personnel to make predictions about the presence, nature and size of subsurface hydrocarbon accumulations."

<<http://www.glossary.oilfield.slb.com/Terms/g/geophysics.aspx>> accessed 1 February 2016

⁴ It has long been recognised by scholars that the degree of understanding of the geophysical characteristics of the natural resource in question may make one conservation law structure more effective than others. K Baltzer, 'Property Rights and the Use of Natural Resources' (Master Thesis, University of Copenhagen 2001).

⁵ Norway, UK and T&T extensive experience in negotiating THRs is relevant to the scope of our study.

practices and how global sustainability concerns are incorporated, and upon which further codification may be predicted. Finally, Part V provides general conclusions and recommendations.

2.2. Early Development of Petroleum Conservation Laws

The oil and gas industry grew rapidly during the industrial revolution. For more than forty years after the drilling of the first US well neither the oil industry nor governments saw a need for conservation laws as we know them today.⁶ It was a time of *laissez-faire* political philosophy and consequently upstream oil and gas operations were largely unregulated.⁷ Conservation during the formative years evolved around what is now called “conventional” operations; during the nineteenth and twentieth centuries, hydrocarbons were mainly developed from reservoirs of natural porous and permeable traps.⁸ Oil and gas operations were largely a search for these traps.⁹ At the time most oil fields around the world were developed with little reservoir knowledge.¹⁰ However, such lack of geological

⁶ Paleontological Research Institution, ‘The Story of Oil in Pennsylvania’

< <https://www.priweb.org/ed/pgws/history/pennsylvania/pennsylvania.html> > accessed 2 February 2016

⁷ As highlighted by Anderson the fortuitously early development of hydrocarbons provided major environmental benefits. First, “as more oil was produced, kerosene became much cheaper than whale oil and was widely used for lighting.” The oil industry saved whale hunting from almost certain extinction. Second, the invention of the internal combustion engine used to power passenger vehicles solved the growing health and environmental issues associated with horse manure in cities. Finally to Anderson a more recent environmental benefit involves how natural gas “has gradually displaced coal for the generation of electricity, as it burns cleaner and is safer to produce.” O Anderson, ‘Foreword: The Evolution of Oil and Gas Conservation Law and the Rise of Unconventional Hydrocarbon Production’ (2014) 68 Ark L Rev 231, 232.

⁸ Hydrocarbons are held in the pore spaces of the source rock. If the source rock is permeable the hydrocarbons will slowly migrate into the pore spaces of neighbouring rocks until dissipating through the subsoil eventually reaching the surface in the form of ‘oil or gas seepages’ or ‘bituminous deposits.’ If the source rock is covered by a number of impermeable rock layers, the hydrocarbons in contrast will not migrate and be trapped. The rock formation, in which hydrocarbons are eventually trapped, is referred to as the reservoir rock or reservoir. Three types of reservoirs may be encountered: (a) Structural Traps, whereby the hydrocarbons are held by the fracture and sliding of impermeable rock masses; (b) Stratigraphic Traps which are formed by the concurrence of rock masses of different permeability; and (c) Combination Traps, i.e. “where the sandbars in a buried river gradually form permeable sandstones surrounded by impermeable shale formed from the mud of the riverbed.” T Daintith, *Finders Keepers? – How the Rule of Capture Shaped the World Oil Industry* (RFF Press 2010) 5.

⁹ In all types of reservoir rock the hydrocarbons are seized within the pores of the rock formation. Under extreme pressure, the hydrocarbon replaces the water within the rock formation and may be separated into a liquid (oil) and/or a gaseous phase (natural gas) with a gas-cap on top of the reservoir. Natural gas with no contact with oil is referred to as ‘non-associated’ or ‘dry’ natural gas.

¹⁰ From early industry development, recovery of hydrocarbons proved to be highly technical and complicated. As a vertical well penetrates a trap the expanding gas or water provides continue and ongoing pressure for the hydrocarbons to find the quickest way to the surface. Depending on the principal source of pressure, a reservoir may be categorized as a water drive, gas-cap drive, or solution gas drive. When a drill bore enters a reservoir “the pressure may be provided by subsurface water held in the reservoir rock below or, more rarely, beside the hydrocarbon deposits, or by the gas that forms a ‘cap’ on top of the oil in the reservoir or is dissolved in solution within that oil.” Daintith, *Finders Keepers?* (n 8) 6.

information and technical expertise left huge volumes of oil and gas unrecovered, generating what today is called “underground waste”.¹¹

The lack of geologic knowledge concerning the fugacious nature of hydrocarbons led operators to adopt a “more wells, more oil” practice.¹² A practice that eventually resulted in the creation of conservation measures. Mainly to prevent resource waste, as physical loss became more and more evident early conservation practices appeared. As early as 1878 in the US Federal State of Indiana regulations were designed to promote plugging and casing of wells in order to avoid underground waste.¹³ Other early means of preventing physical waste came in the form of regulations that prohibited developers from allowing natural gas to escape into the open air for more than two days after discovery.¹⁴ Similar conservation measures were adopted. Prevention of waste appeared in a series of petroleum statutes across the world¹⁵ which ultimately laid the groundwork for the upholding of conservation laws. By the 1930s major oil producing countries adopted some sort of early conservation measures. Mainly to avoid resource waste, regulations on drilling, casing of wells, prohibitions on the use of vacuum pumps to induce a greater flow of gas, proper plugging and abandonment of wells became more and more common.¹⁶

In 1935 US Congress ratified an IOCC, one of the first pieces of legislation to establish comprehensive principles of petroleum conservation.¹⁷ As an effort to promote a “fewer wells, more oil” practice. The initial purpose of Article II of the

¹¹ A classic example illustrated by scholars is the underground waste produced by the Spindletop Oilfield debacle. R Wooster and C Sanders, ‘Spindletop Oilfield’ TSHA <<https://tshaonline.org/handbook/online/articles/dos03>> accessed 12 December 2015. Also see, for example, Anderson (n 7) 244.

¹² The pressure gradient applied to a reservoir, whether by natural or artificial means, may cause an undesired displacement or migration of oil and gas to adjacent reservoirs promoting a competition for drilling as much oil and gas available and as quickly as possible “with the idea either of recovering the petroleum under one’s neighbor’s lands as well as under one’s own”. Daintith, *Finders Keepers?* (n 8) 8.

¹³ Anderson (n 7) 244.

¹⁴ This prohibition led to the landmark United States Supreme Court opinion in *Ohio Oil Co. v. Indiana*. As stated by Kramer As stated by Kramer, the purpose in prohibiting the dissipation of natural gas was that it would cause injury to others with interests in the common source of supply. B Kramer, ‘Unitization: A Partial Solution to the Issues Raised by Horizontal Well Development in Shale Plays’ (2014) 68 Ark L Rev 295, 297, 298.

¹⁵ Daintith, *Finders Keepers?* (n 8) on the history of the rule of capture. Also see, for example, D Yergin, *The Prize The Epic Quest For Oil, Money & Power* (Free Press 1992) and B Kramer (n 14) 297.

¹⁶ Yergin (n 15); Daintith, *Finders Keepers?* (n 8).

¹⁷ Whilst the Compact did not establish any legal obligations it created The Interstate Oil Compact Commission which acted as a forum for state representatives to discuss matters concerning Oil Conservation. The Interstate Oil Compact Commission remains active today with 30 states party to the forum. See Interstate Oil and Gas Commission Charter, IOGCC (16 February 1935) Ch 2 <<http://iogcc.publishpath.com/charter>> accessed 14 August 2015

IOCC was to “conserve oil and gas by the prevention of physical waste thereof from any cause.”¹⁸ Over time the notion of petroleum conservation widened to include pooling, well-spacing and drilling density regulations.¹⁹ Despite the economic benefits of early conservation practices issues around ownership rights immediately arouse; many often preventing the implementation of broader conservation practices. To these ends, following a brief historical analysis of the development of petroleum ownership rights is provided.

2.2.1. Nature of Ownership Rights for Oil and Gas Development

The question of what kind of property rights were held either by the owners of the land or by the developers entitle to explore and exploit hydrocarbons appeared rather soon. No more than 40 years elapsed between the drilling of the first commercial oil discovery near Titusville, Pennsylvania, by ‘Colonel’ Edwin Drake in 1859 and the first US court litigation regarding oil and gas ownership rights. From as early as the late 1890s to the mid-1900s the amount of US court litigation concerning ownership rights prior to discovery and production of oil and gas reservoirs was significant.²⁰ Discussions were centered on whether title to develop oil and gas was a “true” and “full” ownership right. The issue immediately divided the opinion of the courts and beyond.

To a number of US courts the migratory nature of oil and gas was like wild animals and ground water. Legal title was provided to what could be reduce to possession, a position referred today as “no-ownership” or “qualified no-ownership”. Conversely other US courts determined that “the owners of the land that overlaid the reservoir of oil and gas had a real property interest in the reservoir itself”.²¹ The nature of ownership rights not only troubled judges but also legislators and administrative authorities. Ownership rights in oil and gas exploitation became of paramount importance. Ownership became decisive to a range of environmental and conservation laws. As evidenced in the following

¹⁸ The formation of the IOCC was supported by the Connally Hot Oil Act. Yergin (n 15) 239. Originally the IOCC was implemented to establish production quotas for market-demand prorationing. Also see, for example, O Anderson (n 7) 241.

¹⁹ Anderson (n 7) 245.

²⁰ T Daintith, ‘The Rule of Capture: The Least Worst Property Rule for Oil and Gas’ in McHarg A and others (eds), *Property and the Law in Energy and Natural Resources* (OUP 2010) 4.

²¹ J Bennett, ‘Ownership of Transmigratory Minerals, Utah and Zebras: Proof That Oil and Gas Ownership Law Needs Reform’ (2001) 349 JLEL 350.

sections, the choice of an appropriate ownership structure impacted significantly how the law governed early conservation practices.

2.2.1.1. Ownership-in-Place Theory: Oil and Gas as Real Estate

The intense litigation in US courts generated two opposite doctrines of oil and gas ownership: the ownership-in-place theory and the no-ownership theory. To the ownership-in-place- theory, “a landowner owns all substances, including oil and gas which underlie the land”.²² Hemingway defines this theory of ownership within the roots of the common law maxim *cujus est solum, ejus est usque ad coelum et ad inferos* or “to whomever the soil belongs, he owns also to the sky and to the depths.”²³

“Jurisdictions following the ownership-in-place concept recognize ownership of the oil and gas in the ground as part of the land, similar to ownership of hard minerals.”²⁴

The above is supported in *Funk v. Haldeman*²⁵, whereby ownership to oil “being a mineral is part of the realty... In this it is like coal or any other natural product which *in situ* forms part of the land...”.²⁶ Also, in *Texas Co. v. Daugherty*²⁷ oil and gas were likewise considered as part of the land. In such seminal case, the Texas Supreme Court examined whether a tax liability existed in the event that an oil lessee had an interest in the realty. The court recognized that the oil and gas “in-place” were a substantial part of the land as much as the surface itself.

“In place, they lie within the strata of the earth, and necessarily are a part of the realty. Being a part of the realty while in place, it would seem to logically follow that, whenever they are conveyed while in that condition or possessing that status, a conveyance of an interest in the realty results. It is generally conceded that, for the purpose of ownership and conveyance of solid minerals the earth may be divided

²² *ibid* 351.

²³ Hemingway cited in *ibid* 353.

²⁴ *ibid*.

²⁵ *Funk v. Haldeman*, 53 para 229 (1867).

²⁶ Daintith, *Finders Keepers?* (n 8) 30.

²⁷ *Texas Co. v. Daugherty*, 107 Tex 226, 176 SW 717 (1915).

horizontally as well as vertically, and that title to the surface may rest in one person and title to the strata beneath the surface containing such minerals in another. Because of the fugitive nature of oil and gas, some courts, emphasizing the doctrine that they are incapable of absolute ownership until captured and reduced to possession and analogizing their ownership to that of things *ferae naturae*, have made a distinction between their conveyance while in place and that of other minerals, holding that it created no interest in the realty. But it is difficult to perceive a substantial ground for the distinction. A purchaser of them within the ground assumes the hazard of their absence through the possibility of their escape from beneath the particular tract of land, and, of course, if they are not discovered, the conveyance is of no effect, just as the purchaser of solid mineral within the ground incurs the risk of its absence, and therefore a futile venture. But let it be supposed that they have not escaped, and are in repose within the strata beneath the particular tract and capable of possession by the appropriation from it. There they clearly constitute a part of the realty.”²⁸

2.2.1.2. No-ownership Theory

US Federal States such as California, Indiana, Louisiana, New Mexico and Oklahoma have repeatedly rejected the ownership-in-place theory.²⁹ To such oil and gas producing jurisdictions the ownership-in-place theory is internally inconsistent with the fugitive or migratory nature of hydrocarbons. Supporters of the no-ownership theory have stated that “because of the fugitive character of oil and gas in place, the landowner does not own [them] in the same way that he owns solid minerals.”³⁰ To Summers the conceptual error “creeps in when the courts begin to broaden the analogy between oil and gas and solid minerals, to the extent

²⁸ *ibid* 353.

²⁹ Bennett (n 21) 353.

³⁰ *ibid* 360.

of saying that, because oil and gas are like solid minerals in being part of the land, the landowner owns [the oil and gas], because he owns the solid minerals.”³¹

Ownership-in-place jurisdictions were misled by the false analogy to solid minerals. The migratory nature of oil and gas differs entirely with the stationary character of coal and minerals while in the ground. In *Callahan v. Martin* the California Supreme Court stated that:

“the law relating to oil and gas has developed during recent years, and the relationships arising from dealings in this type of property have been analyzed more closely by the courts, the oil in place doctrine has been rejected by a large number of jurisdictions, and other theories developed, which give due recognition to the fugacious, vagrant nature of oil and other hydrocarbon substances, yet in their logical application protect oil interests as estates in real property. There are intimations of approval of the oil and gas in place doctrine in some of the decisions in this state. But other cases unequivocally declare that the owner of land does not have an absolute title to oil and gas in place as corporeal real property, but, rather, the exclusive right on his premises to drill for oil and gas, and to retain as his property all substances brought to surface on his land.”³²

Not all US no-ownership-in-place jurisdictions consider oil and gas interests in the same manner. Some jurisdictions envision oil and gas interests as *profits a prendre*, while other call them *chattels real* or *servitudes*. For example, the California Supreme Court considers oil and gas interests as a *profit a prendre* while the Supreme Court of Louisiana applied the concept of *servitudes*. In *Shaw v. Watson* the Supreme Court of Louisiana confirmed that “a sale of a landowner’s right to the oil or gas beneath his land is an alienation of a real right, which with regard to the prescription by which such rights are released, is classed as

³¹ *ibid.*

³² *ibid* 360.

servitude upon the land.”³³ Regardless of a potential conceptual deviation between *profits a prendre*, *chattels real* or *servitudes*, no-ownership-in-place jurisdictions are consistent with discarding any sort of “full” ownership over hydrocarbons while in the ground.

2.2.1.3. Judicial Analogies: Wild Animals and Ground Water

Not satisfied with treating oil and gas as a solid mineral, courts departed from the law of mineral property to arguments by analogy with wild animals and ground water. US courts reasoned further that the migratory nature of oil and gas did not resemble entirely the legal principles applicable to solid minerals.³⁴ Judicial analogies with the behavior of wild animals and ground waters were soon taken into account. A number of US cases compared the physical behavior of oil and gas to those of wild animals and water. For example, the US case of *Wood County* stated that the geophysical characteristics of oil and gas were more like water than like hard minerals.³⁵

Such analogies lead to the application of the Roman principle of property rights of an un-owned thing to whoever first took possession. A principle historically used to describe the migratory nature of wild animals.³⁶ To a degree the question of oil and gas ownership became a matter of pure control. Ownership rights were granted as long as “control” over such hydrocarbons was feasible. As illustrated in the *Wood County* case, water, oil and gas “belong to the owner of the land, and are part of it, so long as they are on or in it, and are subject to his control; but when they escape, and go into other land, or come under another’s control, the title of the former owner is gone.”³⁷

³³ *ibid.*

³⁴ Daintith, *Finders Keepers?* (n 8) 33.

³⁵ *ibid.*

³⁶ Roman law conceived property within one of four property regimes: *res publica*, *res communes*, *res nullius*, and *res privatae*. Objects for which the property rights are held by the government for the use and benefit of the public, such as navigable rivers, lakes and territorial seas; are *res publica*. Things such as natural light and air that are accessible to any user but can never be exclusively acquired as a whole by any individual or government; are *res communes*. Objects that have no property rights attached to them at all, either because they have been abandoned or because no person has acquired them were considered as *res nullius*. Yet once one or more individuals take firm possession by *occupatio* they become *res privatae*. Examples of *res nullius* were unoccupied lands, enemy property, and wild animals, all of which were subject to become a *res privatae* by *occupatio*. D’Ors A, *Derecho Privado Romano* (Ediciones Universidad de Navarra 1989) 130.

³⁷ Daintith, *Finders Keepers?* (n 8) 34.

The concept of “control” over oil and gas was supported by the notion of “defeasible” property rights.³⁸ To Terence Daintith the fugitive nature of oil and gas was somehow justified by the phrase “now you own it, now you don’t”³⁹ concept of ownership.

2.2.2 The Rule of Capture

To a number of scholars, the rule of capture not only has shaped the oil and gas industry from its early years but continues to be a relevant doctrine of municipal oil and gas law. Its recognition was “the single most important factor in the development of American Oil and Gas Law.”⁴⁰ Even today as evidenced in a recent appropriation case, the rule of capture continues to act as a cornerstone for the US oil and gas industry.⁴¹ For the acclaimed historian Daniel Yergin, the rule of capture became the absolute industry standard, a sort of precondition for the development of the world’s oil industry.⁴² This ownership doctrine which underlies an unlimited desire to produce as quickly and as much volume as possible, established the basis for the further development of the oil and gas sector.

The rule of capture commonly known as the law of capture (expressions used interchangeable) meant that the land owners (or lease or license holders) or who had lawful access to, had the right to recover whatever oil and gas was found beneath their lands (or within the lease or license demarcations), even if such oil and gas may have migrated from neighbouring lands (or neighbouring leases or licenses).⁴³ The rule encourages producers to recover all the oil and gas “even if they disproportionately drained the pool or reduced the output of nearby wells and neighbouring producers.”⁴⁴

³⁸ The notion of “defeasible” property promoted the further separation of ownership into dominant estate and surface rights. Though such division of ownership rights seems quite simple, in practice setting limits between a dominant mineral estate and surface rights has become a very complex task. In a recent US case, the surface owner was distressed with the manner in which the dominant mineral state owner performed decommissioning and clean-up activities. *Coastal Oil and Gas Corp. v. Garza Energy Trust*, 268 S.W. 3d 1, at 13 (Tex 2008).

³⁹ *ibid* 34.

⁴⁰ See, for example, the economist Stuart MacDonald 2003: 291 in Daintith, *Finders Keepers?* (n 8).

⁴¹ *Coastal Oil and Gas Corp* (n 40).

⁴² Yergin (n 15) 32.

⁴³ Emphasis made to apply such definition universally.

⁴⁴ Yergin (n 15) 32.

The law of capture... gives the right to produce all of the oil and gas that will flow out of the well on one's land; and this is a property right. And it is limited only by the physical possibility of the adjoining landowner diminishing the oil and gas under one's land by the exercise of the same right of capture.⁴⁵

Under the law of capture producers of adjoining lands or leases enter into a heated competition to produce as much hydrocarbons as quickly as possible in order to avoid any oil and gas drained by another neighboring producer. To Terence Daintith the "basic evil" behind the rule of capture was the practice of drilling as many wells as possible and "locating them along the boundary lines of one's property, with the idea either of recovering the petroleum under one's neighbor's land as well as under one's own or of protecting oneself from similar predatory behavior by others."⁴⁶

"whether the oil moves, percolates, or exists in pools or deposits... it is property of, and belongs to, the person who reaches it by means of a well, and severs it from the realty and converts it into personality. While it is generally supposed that oil is drained into wells for a distance of several hundred feet, the matter is somewhat uncertain, and no right of sufficient weight can be founded upon such uncertain supposition, to overcome the well-known right which every man has to use his property as he pleases, so long he does not interfere with the legal rights of other."⁴⁷

Draining operations into neighboring lands were permitted as long as reasonable means to extract oil and gas did not "interference with the legal rights of others".⁴⁸ Unfortunately, at the time US courts limited such draining operations only to the law of trespass. The invasion of a well whose shaft crossed adjoining tracts of land, even at 12,000 feet beneath the ground, was considered trespass.

⁴⁵ *Brown v. Humble Oil Co*, 126 Tex 296 at 305, 83 SW 2d 935 at 940 (1935) cited in Daintith, *Finders Keepers?* (n 8) 7.

⁴⁶ *ibid* 8.

⁴⁷ *Ohio Oil Co v. Indiana*, 177 US 190 (1900) cited in Daintith, *Finders Keepers?* (n 8) 47.

⁴⁸ Bennett (n 21) 356.

Drilling down to a certain depth and then horizontally (today acknowledge as the practice of horizontal drilling) was considered a trespass infringement. Although trespass was considered, apportionment within property lines of the hydrocarbons that were once under adjoining lands was authorized without fault. As noted by Bennett, “because of the rule of capture, once the oil and gas molecules are taken from under a person’s land, the person from under whose land the oil was drained cannot reclaim the property even though he was the ‘owner’ of those molecules before the adjacent landowner drained them.”⁴⁹ To that end, under the law of capture the only available recourse was for a person to drill within his property lines as many wells as possible either to draw his own oil and gas and possibly his neighbor’s. This practice was ratified by the Court of Common Pleas of Washington County Pennsylvania:

“What then has been held to be the law? –it is this, as we understand it, every landowner or his lessee may locate his wells wherever he pleases regardless of the interests of others. He may distribute them over the whole farm or locate them only on one part of it. He may crowd the adjoining farms so as to enable him to draw the oil and gas from them. What then can the neighbor do? Nothing, only go and do likewise. He must protect his own oil and gas. He knows it is wild and will run away if it finds an opening and it is his business to keep it at home. This may not be the best rule, but neither the legislature nor our highest court has given us any better. No doubt many thousands of dollars have been expended ‘in protecting lines’ in oil and gas territory that would not have been expended if some rule had existed by which it could have been avoided.”⁵⁰

The practice of the law of capture was strongly supported and as noted by Terence Daintith “hardwired into the mental circuits” of oil producers, judges and

⁴⁹ *ibid* 357.

⁵⁰ *Barnard v. Monongahela Natural Gas Co* (1971) cited in Daintith, *Finders Keepers?* (n 8) 15.

legal scholars.⁵¹ Its basic form is illustrated in the *Hague v. Wheeler* case. To the Pennsylvania Supreme Court “once captured, a mineral owner has a property interest in the gas which allows him to do with it as he pleases, even if he wastes the gas and diminishes the common source of supply.”⁵² To some scholars, at the beginning the law of capture was mainly driven by three key factors: (1) the lack of reservoir understanding and technical expertise to produce oil and gas in the most efficient manner, (2) the large and quick rewards that were to be attained, and (3) the significant premium or royalty imposed by the leasing or concession terms to produce hydrocarbons as quickly as possible.⁵³

2.2.3. Correlative Rights Doctrine

The extreme practice of the rule capture generated a spectacular amount of resource and economic waste. A significant amount of unnecessary wells were being drilled each year. Oil and gas reservoirs were quickly dissipated. The unnecessary physical waste and costs associated with the practice of the rule of capture became unsustainable. Oil producers and surface owners soon claimed the need to restraint production. To oil producer Henry L. Doherty, perhaps the first US campaigner in favour of comprehensive oil conservation measures, the rule of capture was “no more than a ‘law of piracy’ or ‘law of the jungle’ an ‘inherent disease’ and an incitement to ‘competitive delirium’ by opportunists.”⁵⁴

“when a Pennsylvania jurist initiated the idea that soon became crystallized into a principle of law, namely, that ownership to [sic] oil and gas becomes vested by the act of reduction to possession... [W]hen called upon to make a decision on a point on which there was no precedent, fancying he noted some resemblance between its actions and those of wild game, [he] made mention of that resemblance. Other courts being struck by the analogy enlarged upon it and gradually impressed upon oil and gas the existing principles of the law of wild game in so far as it was

⁵¹ *ibid* 17.

⁵² Kramer (n 14) 304.

⁵³ Yergin (n 15) 32.

⁵⁴ Daintith, *Finders Keepers?* (n 8) 13.

possible for analogy to run... We know how fish, deer, bear and buffalo have disappeared... This... was an abortive principle conceived by an opportunist. It violated centuries of experience as to the type of ownership to property that best serves mankind. It conflicted with economic law. It put a premium on wastefulness rather than efficiency. It was a black sheep among legal principle. It did not harmonize with existing institutions. It did not utilize the predominating traits of human nature without which no law can be economically successful.”⁵⁵

As quoted by Samuel Pettengill in his seminal book *Smoke Screen*, the rule of capture not only shape the oil industry but also “forced the industry to be wasteful. It compelled every surface owner over an oil and gas pool to drill, regardless of price or market demand, in order to prevent his neighbor from draining his reserves.”⁵⁶ To mitigate such wasteful effects, a number of jurisdictions started to replace the law of capture with an ownership-in-place doctrine called “correlative rights”. Correlative rights were defined as “the opportunity of each owner in a pool to produce his just and equitable share of oil and gas in the pool without waste.”⁵⁷ Under a correlative rights doctrine, the produced hydrocarbons were divided among the different owners “on the basis of what they could have produced without unnecessary drilling.”⁵⁸

The main objective was to produce as much volume of hydrocarbons as possible without the unnecessary waste and costs associated with the practice of the law of capture. The correlative rights doctrine was intended to prevent the fiercely desire of adjoining landowners to drill on a common reservoir as much and as quickly as possible. Overall the doctrine of correlative rights had three fundamental objectives:

⁵⁵ *ibid.* Quote by Earl Oliver, another predominant early producer in favour of conservation.

⁵⁶ *Smoke Screen* (Southern Publishers NY 1940) at the time of publication the book was seminal on oil overproduction. Samuel Pettengill served as a congressman from Indiana on a congressional subcommittee examining federal oil legislation.

⁵⁷ *ibid* 382. A pool refers to “an underground reservoir containing a common accumulation of oil or gas or both.” H Williams and C Meyers, *Oil and Gas Terms* (5th edn, Matthew Bender 1981) 554.

⁵⁸ Bennett (n 21) 357.

“First and foremost, was the objective to prevent waste. Second, was the objective to protect correlative rights. Third, was the objective to achieve greater ultimate production.”⁵⁹

The recognition of the correlative rights doctrine diminished rapidly the unrestricted practice of the law of capture. To Professors Bruce Kramer and Owen Anderson soon four key restrictions were imposed on the rule of capture: (1) that only the natural flowage or natural migration of hydrocarbons could be capture; (2) that only the use of reasonable means were permitted; and (3) that the common source of supply or pool must be neither injured nor (4) destroyed by unilateral activity.⁶⁰ As supported by the Texas Court of Appeals in the *Browning Oil Company v. Luecke* case:

“Correlative rights afford each landowner the reasonable opportunity to produce his fair share of the recoverable oil and gas beneath his land. But this right is qualified: in exercising their right to a fair share of production, landowners must submit to such limitations as are necessary to enable each owner to get his own fair share of the minerals. They have a duty not to exercise [their] privileges of taking so as to injure the common source of supply.”⁶¹

Correlative rights entitled an “opportunity afforded by the owner of each property in a pool to produce, so far as it is reasonably practicable to do so without waste, his just and equitable share of the oil or gas, or both, in the pool.”⁶² However, certainty to produce his “just and equitable share” was never guarantee.⁶³ This uncertainty was rightfully addressed in the *Cowling* case:

“when a successful exploratory well is initially drilled, it is ordinarily impossible to determine with any degree of precision

⁵⁹ Utah Oil and Gas Conservation Act (in force 1 January 2015) Utah Code Ann. §§ 40-6-1 – 19.

⁶⁰ Daintith, *Finders Keepers?* (n 8) 191.

⁶¹ Bennett (n 21) 357.

⁶² Wyoming Statute, WY Stat 30-5-101(a)(ix).

⁶³ Kramer (n 14) 309.

what are the well drains or the characteristics and extent of the pool. After the initial discovery is made, however, geologic and reservoir engineering data can be developed which enable the Board to fix the size of the drilling units needed to drain the reservoir efficiently. Landowners' correlative rights are then definable based on each landowner's fractional share of the total surface ownership within a particular drilling unit. Of course, not all the wells will produce equal volumes of oil and gas. Thus, the actual value of an interest owner's interest in a particular drilling unit will vary depending on the productivity of the well. Accordingly, a fractional interest in one drilling unit may have greater value than the same fractional interest in another drilling unit in the same field.

In short, under the Act, it is not possible to ascertain a landowners' correlative rights until the Board acquires the necessary data in a formal hearing, makes findings of fact, and enters a spacing and drilling unit order.”⁶⁴

In *Schrimsher Oil & Gas Exploration v. Stoll* the court introduced a new tort to specifically allow recovery of a fair and equitable share in a common source of supply. Similarly in *Russell v. City of Bryan* and *Fransen v. Conoco, Inc.* a “fair share” to a common source of oil and gas was also endorsed.⁶⁵ By 1950 the correlative rights doctrine was fully embedded in the IOCC conservation model.

“It is hereby declared to be in the public interest to foster, to encourage, and to promote the development, production, and utilization of natural resources of oil and gas in the state in such a manner as will prevent waste; to authorize and to provide for the operation and development of oil and gas properties in such a

⁶⁴ *ibid* 384.

⁶⁵ *ibid* 310. Also see, for example, B Kramer and O Anderson, ‘The Rule of Capture –An Oil and Gas Perspective’ (2005) 35 *Envtl L* 899.

manner that a greater ultimate recovery of oil and gas be had and that the correlative rights of all owners be fully protected...”⁶⁶

2.2.4 Unitization

Unitization⁶⁷ is commonly defined as the unified, joint coordinated operation of an oil and gas reservoir by all the title-holders of the separate tracts overlying a single common reservoir. Unitization “it is as if the separate leases and licenses are merged into one single lease or license”⁶⁸, with a unit operator appointed to develop a common source of supply. The term “common source of supply” or “common accumulation of oil and gas” used interchangeably was recognized in the 1938 Texas Natural Resource Code. Under such statutory definition a common accumulation of hydrocarbons occurs when “all parts of the reservoir are permeably connected so as to permit the migration of oil and gas or both from one portion thereof to another wherever and whenever pressure differentials are created as a result of the production of oil and gas from said formation.”⁶⁹ In *Railroad Comm’n v. Graford Oil Corp* the Federal Court of the State of Texas concluded that:

“to be a common reservoir it must appear that the area is underlain by a common accumulation of oil and/or gas. Hence, separate and distinct pools of oil or gas, which are not connected and which do not communicate with one another, do not constitute a “common reservoir”.”⁷⁰

The distinction is of paramount legal importance, both for purposes of municipal law and for THRs. The recognition of a common accumulation of hydrocarbons in a single geological structure is crucial when defining an “inherent right” to insist on unitization. Leaseholders in the US and license holders outside of

⁶⁶ Kramer (n 14) 296.

⁶⁷ This work adopts the US spelling of “unitization” although the term has been translated in different ways, terms such as “unification”, “unitisation”, “individualization” or “communitization” can be found in the various oil and gas laws and regulations worldwide. See, for example, Weaver and Asmus (n 2) 6.

⁶⁸ J Weaver, *Unitization of Oil and Gas Fields in Texas - A Study of Legislative, Administrative, and Judicial Policies* (RFF Press 2011)12.

⁶⁹ Williams and Meyers (n 57) 116.

⁷⁰ *ibid.*

the US authorize to a common reservoir stand in a unique legal relationship to one another. Unitization is performed to maximize ultimate recovery in a process of combining fractionalized ownership of a common reservoir into a single producing unit.⁷¹ Consistent with the benefits of preventing waste and protecting correlative rights unitization statutes were rapidly adopted. Soon, as stated by Weaver, unitization was acknowledged as the best production method for developing hydrocarbons “efficiently” and “fairly”. Petroleum producing jurisdictions began to adopt some form of unitization standards. To scholars, unitization has the following overall effects:

- “... avoids the economic waste of unnecessary well drilling and construction of related facilities that would otherwise occur under the competitive rule of capture.
- It allows sharing of development infrastructure, thus lowering the costs of production through economies of scale and operating efficiencies.
- It maximizes the ultimate recovery of petroleum from a field according to the best technical or engineering information, whether during primary production operations or enhanced recovery operations.
- It gives all owners of rights in the common reservoir a fair share of the production (in U.S. terminology, it “protects correlative rights”).
- It minimizes surface use of the land and surface damages by avoiding unnecessary wells and infrastructure.”⁷²

⁷¹ In the US unitization has the following effects:

- “Each lessee and its royalty-interest owners receive a percentage of production from the unit as a whole, regardless of where the wells are located.
- Leases that would otherwise terminate because they have no production at all or production less than that required by the typical lease remain in effect as long as there is production in paying quantities from the unit.
- The unit operator is free to place wells in the most advantageous position from an engineering standpoint to maximize recovery in the field.” Weaver and Asmus (n 2) 20-1.

⁷² *ibid* 12.

Measured by the number of enacted unitization laws, US quickly became as stated by Weaver the “unitization capital” of the world.⁷³ Outside of the US similar unitization statutes were adopted. The game changing paper delivered by Dr. J.B. Umpleby at the first World Petroleum Congress held in London in 1933 reaffirmed the need to adopt unitization practices outside of the US. The seminal paper argued strongly for the early unitization of common reservoirs.⁷⁴ To Umpleby only through a unitized operation could “one hope for the efficient preservation of reservoir pressures, most notably through avoiding the dissipation of dissolved gas.”⁷⁵ In 1935, UK in its Petroleum (Production) Regulations adopted a “compulsory unitization clause” as one of the model clauses to be incorporated in all petroleum mining licenses.⁷⁶ With minimal amendments, the model clause was widely used for offshore exploitation licenses under the 1964 UK Continental Shelf Act.

“If at any time during the term hereby granted or any renewal thereof the minister shall be satisfied that the licensed area or any part thereof forms part of a *single geological petroleum structure* or petroleum field (hereinafter referred to as “an oil field”) in respect of other parts of which licenses granted in pursuance of the Act are then in force and the minister shall consider that it is in the national interest in order to secure the *maximum ultimate recovery* of petroleum and to avoid unnecessary competitive drilling that the oil field should be worked and developed as a *unit* in co-operation by all the persons, including the Licensee, whose licenses extend to or include any part thereof...”⁷⁷ [emphasis added]

⁷³ In the US with the exception of the State of Pennsylvania and Texas, every major producing state has a compulsory unitization statute. See, for example, Kramer (n14) and Weaver and Asmus (n 2). An article by David Eckman compares the unitization statutes of twenty-nine different producing states in the US. The effort of Professor Eckman is a valuable source of information on US unitization laws. D Eckman, ‘Statutory Fieldwide Oil and Gas Units: A review for Future Agreements’ (1973) 6 Nat Res L 339, 381-82.

⁷⁴ Unitization is recommended at the earliest possible stage of production. Daintith, *Finders Keepers?* (n 8) 348.

⁷⁵ *ibid.*

⁷⁶ Petroleum (Production) Regulations 1935, Schedule 2, Part III.

⁷⁷ Petroleum (Current Model Clauses) Order 1999, SI 1999/160.

Today major oil and gas-producing States has adopted some sort of either voluntary or compulsory unitization statute.⁷⁸ As evidenced in the seminal Twelve-Country Comparative Analysis on municipal laws, regulations and model contract provisions performed by Professor Weaver the conclusions to the survey are of significant value to the further study of transboundary petroleum development in international law.

- Most States in the survey have enacted some type of provision authorizing unitization. A total of ten of the twelve States examined under the survey have legal provisions on unitization in at least one of the three sources of law (municipal laws, regulations and model contract provisions). Two States seem to have no direct provisions dealing with unitization however general provisions dealing with conservation measures to prevent loss are found in specific petroleum production contracts.
- Compulsory unitization is used only after efforts towards voluntary unitization have failed. If the parties cannot agree voluntarily eight States clearly authorize the host-government to impose a unitization plan.
- Legal provisions on unitization are often short. Most of the longer provisions govern procedural matters rather than substantive content. Thus a fair amount of flexibility exists in the negotiation of actual unitization agreements.
- Of the ten States six have unitization clauses in their model contracts. It seems that the preferred method is to use model

⁷⁸ Similar to the UK model provisions and relevant to the scope of our study the Norwegian Petroleum Act defines joint operations as follows:

“Section 4-7 Joint petroleum activities

If a petroleum deposit extends over more than one block with different licensees, or onto the continental shelf of another state, efforts shall be made to reach agreement on the most efficient co-ordination of petroleum activities in connection with the petroleum deposit as well as on the apportionment of the petroleum deposit. This shall apply similarly when, in the case of several petroleum deposits, joint petroleum activities would obviously be more efficient.

Agreements on joint exploration drilling shall be submitted to the Ministry. Agreements on joint production, transportation, utilisation and cessation of petroleum activities shall be submitted to the Ministry for approval. If consensus on such agreements is not reached within reasonable time, the Ministry may determine how such joint petroleum activities shall be conducted, including the apportionment of the deposit.”

Petroleum Act 1996. Act of 29 November 1996 No. 72 relating to petroleum activities. Last amended by Act 24 June 2011 No. 38 (Norwegian Petroleum Act). Norwegian Petroleum Directorate, Ministry of Petroleum and Energy <<http://www.npd.no/en/Regulations/Acts/Petroleum-activities-act/#4-7>> accessed 19 December 2015

host-government contract provisions rather than laws and regulations as the vehicle for stipulating unitization rules.

- The universal trigger for requiring unitization is geological.⁷⁹

2.3. Modern Conservation Practices

2.3.1. Enhanced Recovery

Recovery of hydrocarbons proved to be highly technical and complicated.⁸⁰ Depending on the source of pressure, a reservoir may be categorized as a solution gas drive⁸¹, gas-cap drive⁸², or water drive⁸³. As a vertical or directional well penetrates a reservoir the expanding gas or water provides continue and ongoing pressure for the hydrocarbons to find the quickest way to the surface. To these ends, along with unitization practices, enhanced recovery measures were soon adopted in petroleum conservation laws.⁸⁴ Enhanced recovery operations involves “the establishment of gas-oil ratios, spacing and location of wells on the structure, maintenance of back pressure on oil wells, cycling and recycling of gas, and the

⁷⁹ The twelve petroleum-producing States chosen for the comparative survey are: Angola, Azerbaijan, Brazil, China, Colombia, Ecuador, Egypt, Indonesia, Nigeria, Russia, United Kingdom and Yemen. The twelve States were chosen based on the geographical places where new sources of petroleum are being found and produced today. Weaver and Asmus (n 2) 23-28.

⁸⁰ Bennett (n 21).

⁸¹ Under a solution gas drive production method the oil is recovered as the dissolved gas expands and escapes. The oil recovery ratio of the well increases until all of the gas contained in the reservoir is withdrawn. At this point the pressure declines due to the exhaustion of the gas in the reservoir and the oil production ceases, as the oil cannot longer be forced out of the reservoir. Unfortunately “only 10 to 30 percent of the oil in the reservoir is recovered by this method.” Weaver (n 68) 10.

⁸² Under a gas-cap drive method, a well is drilled into the lower oil zone of the reservoir to expand the gas and hence expel the oil out of the reservoir. Since the gas cannot expand upward through the reservoir, the gas expands with considerable pressure into the lower oil zone driving the oil to be flushed out (called ‘down-dip’) at a greater oil-recovery-rate than does of a solution gas drive method. A properly managed gas-cap drive procedure can yield an oil-recovery-rate of up to 50 percent. *ibid* 12.

⁸³ Within a water drive procedure, the on-going pressure moves the water upward into the oil zone driving the oil into the well bore and out of the reservoir. Contrary to a gas-cap method, it is not the loss of pressure that causes the depletion of the reservoir but the fact that the oil content has been expelled out. Since water can act as a better pushing force than gas, an oil recovery rate of 60 to 75 percent may be possible as long as the reservoir is operated to uphold such continuous flushing force of water. *ibid* 13.

⁸⁴ The terms “enhanced oil recovery” and “enhanced recovery” encompass overall pressure maintenance, secondary recovery and tertiary recovery of oil and gas resources that are not produced during “primary operations”. Primary operations start with the drilling of exploratory wells called “wildcat wells”. In most oil and gas producing States, once a “wildcat well” produces marketable amounts of hydrocarbons a filing before the petroleum regulator to develop a reservoir normally occurs. The government agency will then conduct a public hearing to set the rules that will govern the development of the new reservoir. R Strudwick, ‘Fieldwide Unitization’ (2014) 68 Ark L Rev 425, 428-429.

introduction of gas, water or other substance into the producing formation for the maintenance or renewal of reservoir pressures.”⁸⁵ Similar to unitization, enhanced recovery also promotes two important goals of conservation: (1) the prevention of waste by the overall conservation of oil and gas resources; and (2) the protection of correlative rights in a common source of supply.⁸⁶

Enhanced recovery operations were widely included under the 1999 IOGCC Model Unitization Statute “to carry on pressure maintenance or repressuring, cycling, water flooding, any combination of these operations, or any other method of cooperative development and operation which increases the ultimate recovery of oil and gas.”⁸⁷ Another comprehensive example is also provided under the Utah Oil and Gas Conservation Act.

“[I]t is declared to be in the public interest to foster, encourage, and promote the development, production, and utilization of natural resources of oil and gas in the state of Utah in such a manner as will prevent waste; to authorize and to provide for the operation and development of oil and gas properties in such a manner that a greater ultimate recovery of oil and gas may be obtained and that the correlative rights of all owners may be fully protected; to provide exclusive state authority over oil and gas exploration and development as regulated under the provisions of this chapter; to encourage, authorize, and provide for voluntary agreements for cycling, recycling, pressure maintenance, and secondary recovery operations in order that the greatest possible economic recovery of oil and gas may be

⁸⁵ N Saint-Paul, *Summers Oil and Gas* (3rd ed, 2004) section 5(2) quoted in *ibid* 30; The Schlumberger Oilfield Glossary defines “enhanced oil recovery” as follows:

An oil recovery enhancement method using sophisticated techniques that alter the original properties of oil. Once ranked as a third stage of oil recovery that was carried out after secondary recovery, the techniques employed during enhanced oil recovery can actually be initiated at any time during the productive life of an oil reservoir. Its purpose is not only to restore formation pressure, but also to improve oil displacement or fluid flow in the reservoir. The three major types of enhanced oil recovery operations are chemical flooding (alkaline flooding or micellar-polymer flooding), miscible displacement (carbon dioxide [CO₂] injection or hydrocarbon injection), and thermal recovery (steamflood or in-situ combustion). The optimal application of each type depends on reservoir temperature, pressure, depth, net pay, permeability, residual oil and water saturations, porosity and fluid properties such as oil API gravity and viscosity. Enhanced oil recovery is also known as improved oil recovery or tertiary recovery and it is abbreviated as EOR.

<<http://glossary.oilfield.slb.com/en/terms/e/enhancedoilrecovery.aspx>> accessed 27 December 2015

⁸⁶ To petroleum engineering experts Dr. Charles Haynes and Wayne Stafford every oil and gas reservoir could benefit from enhanced recovery operations. Further, “early initiation of enhanced recovery operations increases ultimate production in a field or reservoir.” Strudwick (n 84) 430.

⁸⁷ Model Unitization Statute, IOGCC s A(2).

obtained within the state to the end that the land owners, the royalty owners, the producers, and the general public may realize and enjoy the greatest possible good from these vital natural resources.”⁸⁸

2.3.2. Compulsory Pooling and Fieldwide Unitization

The use of hydraulic fracturing⁸⁹, horizontal drilling⁹⁰, and micro seismic monitoring⁹¹ have facilitated the development of “unconventional”⁹² oil and gas.

⁸⁸ Utah Oil and Gas Conservation Act (in force 1 January 2015) Utah Code Ann §§ 40-6-1 –19.

⁸⁹ The Schlumberger Oilfield Glossary defines “hydraulic fracturing” as follows:

A stimulation treatment routinely performed on oil and gas wells in low-permeability reservoirs. Specially engineered fluids are pumped at high pressure and rate into the reservoir to be treated, causing a vertical fracture to open. The wings of the fracture extend away from the wellbore in opposing directions according to the natural stresses within the formation. Proppant, such as grains of sand of a particular size, is mixed with the treatment fluid to keep the fracture open when the treatment is complete. Hydraulic fracturing creates high-conductivity communication with a large area of formation and bypasses any damage that may exist in the near-wellbore area.

<http://glossary.oilfield.slb.com/en/terms/h/hydraulic_fracturing.aspx > accessed 27 December 2015

⁹⁰ The Schlumberger Oilfield Glossary defines “horizontal drilling” as follows:

A subset of the more general term “directional drilling,” used where the departure of the wellbore from vertical exceeds about 80 degrees. Note that some horizontal wells are designed such that after reaching true 90-degree horizontal, the wellbore may actually start drilling upward. In such cases, the angle past 90 degrees is continued, as in 95 degrees, rather than reporting it as deviation from vertical, which would then be 85 degrees. Because a horizontal well typically penetrates a greater length of the reservoir, it can offer significant production improvement over a vertical well.

The intentional deviation of a wellbore from the path it would naturally take to a horizontal trajectory. Horizontal lateral sections can be designed to intersect natural fractures or simply to contact more of the productive formation. Horizontal drilling is accomplished through the use of whipstocks, bottomhole assembly (BHA) configurations, instruments to measure the path of the wellbore in three-dimensional space, data links to communicate measurements taken downhole to the surface, mud motors and special BHA components, including rotary steerable systems and drill bits. While many techniques can accomplish this, the general concept is simple: Direct the bit in the direction that one wants to drill. By placing a bend near the bit in a downhole steerable mud motor, the bend points the bit in a direction different from the axis of the wellbore when the entire drillstring is not rotating. By pumping mud through the mud motor, the bit turns while the drillstring does not rotate, allowing the bit to drill in the direction it points. When a particular wellbore direction is achieved, that direction may be maintained by rotating the entire drillstring (including the bent section) such that the bit does not drill in a single direction off the wellbore axis. Instead, the bit sweeps around and its net direction coincides with the existing wellbore. Rotary steerable tools allow steering while rotating, usually with higher rates of penetration and ultimately smoother boreholes. Horizontal drilling is common in shale reservoirs because it allows drillers to place the borehole in contact with the most productive reservoir rock.

<http://glossary.oilfield.slb.com/Terms/h/horizontal_drilling.aspx> accessed 27 December 2015

⁹¹ The Schlumberger Oilfield Glossary defines “microseismic monitoring” as follows:

A technique to track the propagation of a hydraulic fracture as it advances through a formation. Microseisms are detected, located, and displayed in time for scientists and engineers to approximate the location and propagation of the hydraulic fracture. Software provides modelling, survey design, microseismic detection and location, uncertainty analysis, data integration, and visualization for interpretation. Computer imagery is used to monitor the activity in 3D space relative to the location of the fracturing treatment. The monitored activities are animated to show progressive fracture growth and the subsurface response to pumping variations. When displayed in real time, the microseismic activity allows one to make changes to the stimulation design to ensure optimal reservoir contact. Also known as hydraulic fracture monitoring, this technique delivers information about the effectiveness of the stimulation of a reservoir that can be used to enhance reservoir development in shale gas completions.

The search for unconventional resources has incentivized development to an unprecedented rate. Advanced technology in seismology can determine with accuracy the location, volumes and features of reservoirs whether onshore or offshore.⁹³ In the past 10 years innovation in hydraulic fracturing⁹⁴ and data gathering and processing has taken development to unthinkable levels.⁹⁵ Unfortunately in some petroleum producing jurisdictions, recent development of unconventional oil and gas resources⁹⁶ has taken the industry back to the “more wells, more oil” wasteful practices.

In respond to such new petroleum development trends, conservation measures had to adapt to such new legal environments. Conservation agencies began to regulate drilling and production methods further, this time not only to

<http://glossary.oilfield.slb.com/Terms/m/microseismic_monitoring.aspx> accessed 27 December 2015

⁹² The Schlumberger Oilfield Glossary defines “unconventional resource” as follows:

“An umbrella term for oil and natural gas that is produced by means that do not meet the criteria for conventional production. What has qualified as unconventional at any particular time is a complex function of resource characteristics, the available exploration and production technologies, the economic environment, and the scale, frequency and duration of production from the resource. Perceptions of these factors inevitably change over time and often differ among users of the term. At present, the term is used in reference to oil and gas resources whose porosity, permeability, fluid trapping mechanism, or other characteristics differ from conventional sandstone and carbonate reservoirs. Coalbed methane, gas hydrates, shale gas, fractured reservoirs, and tight gas sands are considered unconventional resources.”

<http://www.glossary.oilfield.slb.com/en/Terms/u/unconventional_resource.aspx> accessed 1 February 2016

⁹³ To date 3D seismic data has been the industry’s most impactful scientific breakthrough. This data vastly improves the picture of the Earth’s subsurface and removes the need to drill exploratory wells. Seismology, rightfully so, has received the most research attention (billions of dollars yearly), trying to better tune data acquisition and processing, in an effort to identify all of the major components in a hydrocarbon reservoir.

⁹⁴ As of 2014, 3.5 million “frac jobs” had been performed worldwide on oil and gas wells; over two million of those within the U.S. Hydraulic fracturing is highly controversial; whereas its proponents advocate the economic benefits of more extensively accessible hydrocarbons, opponents argue that the environmental impacts of fracking include the risks of contaminating ground water, depleting fresh water, degrading air quality, potentially triggering earthquakes, noise pollution, surface pollution, and the consequential hazards to public health and the environment. For these reasons, hydraulic fracturing is under international scrutiny, restricted in some countries, and banned altogether in others. UK has banned the practice. The European Union is drafting regulations that would permit controlled application of hydraulic fracturing.

⁹⁵ New technologies on seismic gathering data, hydraulic fracturing and horizontal drilling have trigger US oil and gas production to unprecedented rates. In 2011 the US became the world’s leading producer of natural gas when it outproduced Russia. In 2013, the IEA projected that the US, now the world’s third-largest oil producer behind Saudi Arabia and Russia, will see such an increase in oil from hydraulic fracturing that the US will become the world’s top oil producer by 2020. As of 2014 more than two million oil and gas wells in the US have been hydraulically fractured, and that of new wells being drilled, up to 95% are hydraulically fractured.

⁹⁶ The Schlumberger Oilfield Glossary defines “unconventional resource” as follows:

An umbrella term for oil and natural gas that is produced by means that do not meet the criteria for conventional production. What has qualified as unconventional at any particular time is a complex function of resource characteristics, the available exploration and production technologies, the economic environment, and the scale, frequency and duration of production from the resource. Perceptions of these factors inevitably change over time and often differ among users of the term. At present, the term is used in reference to oil and gas resources whose porosity, permeability, fluid trapping mechanism, or other characteristics differ from conventional sandstone and carbonate reservoirs. Coalbed methane, gas hydrates, shale gas, fractured reservoirs, and tight gas sands are considered unconventional resources.

<http://glossary.oilfield.slb.com/Terms/u/unconventional_resource.aspx> accessed 27 December 2015

avoid underground waste and safeguard correlative rights but to also to minimize surface use and pollution and to protect fresh water from hydrocarbon development.⁹⁷ Regulators adopted broader mandatory pooling laws and unitization practices. Although the terms pooling and unitization are often used interchangeably, pooling regulations refer to “the joining together of small tracts or portions of tracts for the purpose of having sufficient acreage to receive a well drilling permit under the relevant state or local spacing [or drilling] laws and regulations.”⁹⁸ Pooling has its origins in drilling well-spacing regulations, whereby lineal spacing rules and density spacing rules triggered the need to consolidate small tracts into a single operation.⁹⁹ Pooling is done mainly to avoid unnecessary drilling as small oil and gas interests are merged into a single unit regardless of the permeability characteristics of the reservoir. The distinction between pooling and unitization is important as different legal effects applied, specially when defining conservation measures for unconventional development.

Relevant to unconventional development, fieldwide unitization provisions were adopted to require an overreaching unitization practice of all or a part of a entire oil field for recovery under a single operator.¹⁰⁰ A fieldwide unit is commonly defined as a considerable area designated by the regulator or the conservation commission with a specified size and shape upon which a number of

⁹⁷ The protection of freshwater from hydrocarbon pollution has become a significant issue when evaluating unconventional resources.

⁹⁸ Definition of Pooling in Williams and Meyers (n 57) 1109-10. In the US the increase of horizontal fracturing has made mandatory pooling laws particularly relevant. For the development of unconventional resources pooling refers to the accumulation of smaller tracts of land to sum total surface of which are required for a petroleum agency to grant a well permit or assign a production quota allowable to a petroleum operator. Under compulsory pooling the non-consenting landowner is typically offered an opportunity to either participate in the voluntary pooling agreement or is granted a statutorily compensation package. See the study on US Compulsory Pooling Laws. Compulsory pooling laws: protecting the conflicting rights of neighbouring landowners, National Conference of State Legislatures (24 October 2014) <<http://www.ncsl.org/research/energy/compulsory-pooling-laws-protecting-the-conflicting-rights-of-neighboring-landowners.aspx>> accessed 27 June 27 2015

⁹⁹ Establishment of drilling units for gas production from conventional and unconventional sources of supply for certain prospective areas not covered by field rules, General Rule B-43, Arkansas Oil and Gas Commission (adopted 16 October 2006) Arkansas Code Ann 15-72 19-10-201, provides a comprehensive example of both types of well-spacing regulations. “General Rule B-43 governs development in the Fayetteville Shale play by mandating 640-acre units. This regulation, however, limits the number of wells on an individual unit to sixteen, and each unconventional well is prohibited from being located any closer than 560 feet from a unit boundary or another well.” Kramer (n14) 300.

¹⁰⁰ The Schlumberger Oilfield Glossary defines “oil field” as:

An accumulation, pool or group of pools of oil in the subsurface. An oil field consists of a reservoir in a shape that will trap hydrocarbons and that is covered by an impermeable or sealing rock. Typically, industry professionals use the term with an implied assumption of economic size. The surface area above a subsurface oil accumulation is called an oil field.

<<http://glossary.oilfield.slb.com/Terms/o/oilfield.aspx>> accessed 27 December 2015

wells may be drilled. As with traditional unitization practices, the overall purpose of fieldwide unitization is to set the “optimum spacing” and “placement of wells” for the efficient exploitation of a common reservoir as a single unit operation¹⁰¹ while providing each lease owner or licensee an equitable benefit from development. Under fieldwide unitization regulators often encourage licensees to “consolidate, merge or otherwise combine their interests for the purpose of accomplishing the more efficient and more economical development and production” of significant areas.¹⁰² Most conservation agencies would not issue a fieldwide unitization order unless certainty to prevent waste and conserves natural resources is attained.¹⁰³ Nowadays the implementation of enhanced recovery, statutory pooling and fieldwide unitization by petroleum regulators provides a noteworthy opportunity to further develop oil and gas resources efficiently and fairly; whether for conventional or unconventional, municipal or transboundary development. However as evidenced in the following sections, to some scholars, modern conservation practices are not yet implemented and utilized to their fullest extent, particularly for transboundary development.¹⁰⁴

2.3.3. Technical Basis for the Apportionment of Oil and Gas Resources

As evidenced in the previous sections the geological elements of an oil and gas reservoir are highly unpredictable. In order to determine in advance the volumes of oil and gas in-place, precise knowledge of the rock porosity and hydrocarbon saturation must be acquired.¹⁰⁵ As the hydrocarbons confined in a reservoir may

¹⁰¹ Relevant to the scope of our study the Oil and Gas Conservation Act of the Province of Alberta, Canada provides a comprehensive definition of unit operations.

“(e) “unit operation” means the operation in accordance with a scheme or plan for combining the interests of owners in a common source of supply of oil or gas in any field or pool or part of a field or pool so that

(i) the operation may be conducted as if there were only one operator and one tract, and
(ii) the cost or expenses of the operation and the oil or gas produced by it are distributed among the owners or tracts according to a formula or a schedule of participation...”

Oil and Gas Conservation Act Alberta Part 12, Unit Operation s 78(e).

¹⁰² *ibid* Section 79(1).

¹⁰³ For example under the applicable Ohio Unitization Statute, the lease holder must evidence “that such operation is reasonably necessary to increase substantially the ultimate recovery of oil and gas, and the value of the estimated additional recovery of oil and gas exceeds the estimated additional cost incident to conducting the operation.” Ohio Rev Code ANN 1509.29(A). Kramer (n 14) 318.

¹⁰⁴ Kramer (n 14) 439.

¹⁰⁵ Hydrocarbon saturation is calculated knowing the resistivity of the reservoir interval, the porosity, and the resistivity (a function of the saltness) of the water. To estimate the volumes of hydrocarbons which can be recovered at the surface two additional factors must be determined. Firstly, a recovery factor, a function of the behaviour of the fluid in the reservoir and the reservoir engineering design for the field must be assigned. Secondly there will be volume and compositional changes

not flow to the surface in the same proportions as they are distributed throughout the reservoir, allocation of a common source of supply becomes extremely complex.¹⁰⁶ Often allocating volumes of hydrocarbons within different licensees becomes highly speculative.¹⁰⁷ To the industry practice there is no absolute certainty to hydrocarbon estimation until “subsequent drilling enables reserves to be moved from possible and probable categories into the proven category.”¹⁰⁸

Initial estimation of hydrocarbons volumes can differ greatly. For conservation agencies this is of particular legal relevance, as in order to protect correlative rights regulators are forced to develop equitable allocation formulas, often with minimum information. Apportionment will normally depend upon a number of factors. These key factors often include the geologic characteristics of the reservoirs and the production history of the areas. For example, an area with greater reserves and greater productive capacity will be given more weight in the formula than an area with less reserves and a lower productive capacity. Because no single production method can guarantee an appropriate distribution, a formula to “fairly” distribute unit interests (revenues) varies substantially; generating an ongoing technical and legal challenge for equitable allocations. The term “fair participation” is commonly defined as “the amount of recoverable oil and gas underlying each owner’s tract [or licensee rights], such that uncompensated drainage between tracts is prevented”¹⁰⁹ [emphasis added]. From the twelve-country unitization survey performed by Weaver, relevant provisions merely mention that the determination of unit interests should be “equitable”; all without including any further factors for allocation.

when fluids are brought up from the high temperatures and pressure found in the reservoir and stabilized at surface temperatures and pressure. Combination of the reservoir rock volume with porosity and hydrocarbon saturation yields are frequently used as basis for the determination of reserves across ownership boundaries. R Swarbrick, ‘Oil and Gas Reservoirs Across Ownership Boundaries: The Technical Basis for Apportioning Reserves’ in Blake, G and others (eds), *The Peaceful Management of Transboundary Resources* (Graham & Trotman 1995) 41.

¹⁰⁶ *ibid* 42.

¹⁰⁷ A useful three-fold division of recoverable reserves estimation and apportionment is currently used by the oil and gas industry. The certainty of hydrocarbon volume recovery decreases from the proven to possible category: “Proven reserves: hydrocarbon volumes known to be present which can be produced at current prices using existing technology. This category of reserves is auditable (i.e. the geological and geophysical basis can be verified) and forms the basis for company assets attributed to unproduced oil and gas. Probable reserves: hydrocarbon volumes whose likelihood of being present are high but there is more uncertainty as to the range of possible volumes than in the proven category. Possible reserves: hydrocarbon volumes which are generally not tested by drilling but whose probability of existing is based on geological/geophysical understanding of the likely distribution of hydrocarbons in the area.” *ibid* 48.

¹⁰⁸ *ibid*.

¹⁰⁹ Weaver and Asmus (n 2) 45.

In the *Gilmore v. Oil & Gas Conservation Commission* case the Wyoming Supreme Court upheld a formula containing as much as eleven factors.¹¹⁰ Usually, and in accordance with the *Gilmore v. Oil & Gas Conservation Commission* case, and also found under international agreements, relevant allocation factors often include: “acreage size, estimated oil in place, estimated recoverable reserves, number of useable wells for production and injection, current and cumulative production, reservoir production mechanisms and others.”¹¹¹ Unfortunately, it seems that the ultimate result is not always to provide a “fair” and “reasonable” interest to all parties involved. To Weaver however, the doctrine of correlative rights takes a sort of “back seat” in maximizing the physical recovery of oil or gas as clearly notes that often “the national interest lies in achieving greater recovery rates and efficiency rather than in the distribution of interest among affected parties.”¹¹²

2.4. Recent Trends in Petroleum Conservation Laws and Regulations

Nowadays, one must question which property structure serves best for conservation purposes along with other well-established or emerging principles of economic development and environmental law. There is no doubt that conservation practices have evolved to include broader principles of sustainable development. Currently the term petroleum conservation is frequently associated to sustainability. As discussed in the previous Chapter, petroleum conservation is closely aligned to the fundamental pillars of sustainable development. Whilst the producers of a common source of supply should fairly benefit from production, it also raises the notion of a larger social and environmental public interest.

Recent incidents such as the Macondo blowout in the Gulf of Mexico have raised awareness of the negative environmental and social implications of offshore

¹¹⁰ Strudwick (n 84) 435.

¹¹¹ S Amui & M Melo, ‘Unitization of Oil and Gas Reservoirs’, AIPN Advisor (May 2003) 8; Weaver and Asmus (n 2) 45.

¹¹² Weaver and Asmus (n 2) 47-48. The above is also supported by the UK Department of Trade and Industry guidance notes regarding unitization:

“The Department does not consider that powers to require unitization extend to issues of fairness and equity between groups of licensees...”

The Departments’ acceptance or rejection of any field development program will, therefore, be on the basis of whether or not it is an optimum development in terms of maximizing the economic recovery of oil and gas.” UK Department of Trade and Industry Oil & Gas Directorate –Regulation Guidance Notes.

oil and gas operations. As a minimum, current offshore oil and gas activities should include a rigorous assessment of the surrounding environments, including other ecosystems, such as waters, marine life, and climate, whilst applying best practices on social, health, safety and environmental matters.¹¹³ Recent trends in conservation laws also include a holistic approach to nature.¹¹⁴ It further contemplates the reduction of CO₂ from activities such as flaring at upstream platforms and carbon sequestration¹¹⁵ and the promotion of energy efficiency.¹¹⁶ Surface and environmental impacts, including air and water pollution, are also increasingly considered by conservation agencies in regulatory programs. A comprehensive example is provided by the Colorado Conservation Commission so “as to prevent and mitigate significant adverse environmental impacts on any air, water, soil, or biological resource resulting from oil and gas operations to the extent necessary to protect public health, safety, and welfare, including protection of the environment and wildlife resources, taking into consideration cost-effectiveness and technical feasibility.”¹¹⁷

To reinforce all of the above, and relevant to our search for the application of conservation practices in petroleum development, following is a brief

¹¹³ For example, ICZM aims to establish plans to maximize the benefits of the coast by taking a holistic view of all sector activities whilst minimizing harmful impacts upon the environment. ICZM is a form of environmental best practice based upon the concept of sustainability of the coastal environment which supports of Oil Conservation. It is defined as the governance process which consists of the “legal and institutional framework necessary to ensure that development and management plans for coastal zones are integrated with environmental (including social) goals and are made with the participation of those affected. J Post, C Lundin and the World Bank, *Guidelines for Integrated Coastal Zone Management* (The World Bank 1996).

¹¹⁴ Holistic in the Merriam-Webster Dictionary and Thesaurus refers “to or concerned with wholes or with complete systems rather than with the analysis of, treatment of, or dissection into parts <holistic ecology views humans and the environment as a single system>” at <<http://www.merriam-webster.com/dictionary/holistic>> accessed 20 January 2016

¹¹⁵ Since 2006 the New Mexico Energy, Minerals, and Natural Resources Department’s Oil Conservation Division has sought ways to reduce carbon emissions in oil and gas operations including the use of carbon sequestration technologies. In 2013 the division approved an enhanced oil recovery process from Occidental Permian Limited Partnership to inject water, CO₂ and produced gases into the South Hobbs Grayburg-San Andres Pressure Maintenance Project after taking a holistic review of matters including the impact on fresh water sources in the area. Holland & Hart, ‘Carbon Sequestration Update on National and Western State Activities’ (2007) <<https://www.hollandhart.com/files/CarbonSequestration.pdf>> accessed 20 November 2015; Minutes Of The Meeting Of The Oil Conservation Commission Held On May 9-10, 2013, New Mexico Oil Conservation Division <<http://www.emnrd.state.nm.us/OCD/documents/May9ComMin.pdf>> accessed 20 November 2015

¹¹⁶ Whilst energy efficiency is often linked to the use of energy by the end user it also applies to upstream oil and gas activities where the choice of equipment used affects the energy used in producing the oil and gas, for example the energy efficiency of motors and pumps used on a platform.

¹¹⁷ Colorado Rev Stat. Relevant international environmental Conventions that influence oil and gas activities under recent conservation practices are the Montreal Protocol of the Vienna Convention, The Basel Convention, The Convention on Migratory Species, The Framework Convention on Climate Change, CBD, UNCLOS, MARPOL 73/76 and the Regional Sea Conventions (Barcelona, OSPAR, and Kuwait). Environmental Management in Oil and Gas Production and Exploration Guidelines, Joint E&P Forum/ UNEP Technical Publication, E&P Forum Report 2.72/254, 22.

description of the petroleum municipal laws and regulations of Norway, UK and Trinidad and Tobago. It is not intended to be a thorough study of the relevant oil and gas municipal laws and regulations.¹¹⁸ Its purpose is limited to determine if petroleum conservation practices are effectively applied and how the three basic elements of sustainable development – the economy, society and the environment – are incorporated into the petroleum legal framework.

2.4.1. Norway Petroleum Conservation Legal Framework

The Norwegian State has the proprietary right to offshore petroleum reservoirs and the exclusive right to resource management. Resource management is executed by the King in accordance with the decisions made by the Storting (Parliament). Resource management of petroleum resources is intended to be carried out in a long-term perspective for the benefit of the Norwegian society as a whole. Resource management “shall provide revenues to the country and shall contribute to ensuring welfare, employment and an improved environment, as well as to the strengthening of Norwegian trade and industry and industrial development, and at the same time take due regard to regional and local policy considerations and other activities.”¹¹⁹

Through an extensive legislation, the Norwegian State manages and oversees the petroleum industry. All phases of the petroleum activities require some sort of license and/or approvals from competent authorities and licensing rounds are organized to ensure adequate exploitation of both mature and greenfield areas of the Norwegian continental shelf.¹²⁰ In addition, oil and gas activities take place within comprehensive health, safety and environmental frameworks. Oil companies and other actors in the industry are held responsible

¹¹⁸ Examples of municipal legislation that apply to petroleum conservation practices are: petroleum laws, planning laws, environmental protection acts, environmental impact assessment, clean air and water acts, water catchment protection, marine pollution, standards for noise, radiation, chemical exposure, IPC, discharge and management of wastes, land contamination or land disturbance, permitted chemicals, safety and fire regulations, control of major hazards, storage and usage of chemicals, public and worker health and safety, national park or protected area laws, forest protection laws, protection of indigenous and cultural heritage or fishery protection and marine navigation and safety. Environmental Management in Oil and Gas Production and Exploration Guidelines, Joint E&P Forum/ UNEP Technical Publication, E&P Forum Report 2.72/254, 24.

¹¹⁹ Norwegian Petroleum Act. See Norwegian Petroleum Directorate, Ministry of Petroleum and Energy. <<http://www.npd.no/en/Regulations/Acts/Petroleum-activities-act/#4-7>> accessed 19 December 2015

¹²⁰ *ibid.*

for the lack of sound and sustainable operations.¹²¹ It is an industry heavily regulated.

A range of policy instruments¹²² ensures that actors in the sector include environmental and climate concerns during all phases of development and that public participation procedures allow the public opinion and concerns to be taken into account.¹²³ The Norwegian authorities together with industry operators have elaborated a risk-measuring tool known as RNNP.¹²⁴ Releases from the petroleum sector¹²⁵ are always documented. Operators on the Norwegian continental shelf must report data on releases directly in the EPIM Environment Hub, or EEH¹²⁶. Requirements to reduce greenhouse gas emissions¹²⁷ have also been thoroughly

¹²¹ Chapter 7 of the Norwegian Petroleum Act regulates responsibility and states liability for pollution damages. Chapter 9 and 10 regulate safety requirements for the industry. Licensees are accurately liable for pollution damage. According to the Norwegian Pollution Control Act operators are responsible for dealing with severe pollution resulting from their own activities, and are obliged to maintain an appropriate level of emergency awareness and response. Act of 13 March 1981 No.6 Concerning Protection Against Pollution and Concerning Waste (Norwegian Pollution Control Act). Procedures for impact assessments and approval of plans for new developments (PDOs/PIOs) are basis of the petroleum legislation. Assessments and the opening of new areas are regulated in Chapter 3 of the Petroleum Act and 2a of the Petroleum Regulations. Petroleum Act Legal Framework see <<http://www.norskpetsroleum.no/en/framework/petroleum-act/>> accessed 28 December 2015

¹²² Norwegian Petroleum Act, CO₂ Tax Act, Sales Tax Act, Greenhouse Gas Emissions Trading Act or Norwegian Pollution Control Act among others. Facilities onshore and within the baseline are also subject to the provisions of the Planning and Building Act. *ibid*.

¹²³ Directive 2003/35/EC of the European Parliament and of the Council of 26 May 2003 provides for public participation in respect of the drawing up of certain plans and programs relating to the environment and with regard to public participation and access to justice see Council Directives 85/337/EEC and 96/61/EC. The Petroleum Directorate proposed opening 104 new blocks in the Norwegian and Barents seas for drilling, but this was eventually reduced to 79 after strong objections were raised over many of them. Environmental and civil organizations among others have also protested strongly against ongoing seismic mapping activities off the Vesterålen and Lofoten Islands in northern Norway – areas of exceptional importance to fisheries, which have not yet been opened for drilling. Environmental organizations and civil society groups fear that if the results indicate the likely presence of oil or gas, drilling licenses will follow. Based on historical experience, the fear is understandable as no highly promising areas have so far been permanently excluded from exploitation. “Norwegian climate and energy policies” in The SusNordic Gateway –Governance for the sustainable development of the Nordic region < <http://folk.uio.no/kristori/prosus/susnordic/presentation/index.html>> accessed 13 December 2015

¹²⁴ Petroleum Safety Authority Norway, Risk Level at <<http://www.psa.no/about-rnnp/category911.html>> accessed 28 December 2015

¹²⁵ Petroleum activities result in releases of waste gas containing CO₂, NO_x, NMVOCs, CH₄ and SO₂. Petroleum sector releases to the sea residues of oil and chemicals derived from the production process. There are also some discharges of drill cuttings contaminated with water-based drilling fluids. Climate & Environment considerations <<http://www.norskpetsroleum.no/en/framework/climate-and-environment/>> accessed 29 December 2015

¹²⁶ A joint database established by the Norwegian Environment Agency, the Norwegian Petroleum Directorate and the Norwegian Oil and Gas Association <<https://www.epim.no/epim/main/about>>

¹²⁷ The Carbon Tax is imposed on all use of gas, oil and diesel in operations on the continental shelf. Norwegian Ministry of Climate and Environment - Norway's Sixth National Communication under the Framework Convention on Climate Change <https://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/nor_nc6_br1.pdf> accessed 29 December 2015

The Greenhouse Gas Emissions Trading Act. Act of 17 December 2004 No. 99 Relating to Greenhouse Gas Emission Allowance Trading and the Duty to Surrender Emission Allowances. Norway, as member of the EU ETS, is obliged to comply with the Emissions Trading Directive. The EU ETS is a ‘cap and trade’ system, which establishes a market for trading in

developed.¹²⁸ Energy consumption has been made more efficient, and flaring of gas has been reduced to a minimum. At certain facilities CO₂ is separated from the gas stream and reinjected into subsea formations for safe storage.¹²⁹ Norway's petroleum legal framework include forefront provisions to reduce greenhouse gas emissions such as the use of combined-cycle gas turbines,¹³⁰ CO₂ storage, energy efficiency measures¹³¹ and electricity from shore initiatives.¹³² Other emissions such as NO_x emissions¹³³ or chemical discharges to the sea¹³⁴ require special permits. NMVOC emissions¹³⁵ have been reduced substantially by using emission abatement technology. Discharges to the sea are reduced either by treatment before discharge, deposition below the seabed or by treatment as perilous waste initiatives.¹³⁶

emission allowances and a cap on the total amount of greenhouse gases that installations in the system are allowed to emit at <http://ec.europa.eu/clima/policies/ets/index_en.htm> accessed 29 December 2015

¹²⁸ Authorities have required the oil companies to make use of natural gas. The Ministry of Petroleum and Energy must approve the Plan for development and operation (PDO). For safety reasons, flaring is only permitted when necessary. Norwegian Petroleum Act Ch 4.

¹²⁹ Norwegian Legal Framework, Climate and Environment section at <<http://www.norskipetroleum.no/en/framework/climate-and-environment/>> accessed 29 December 2015

¹³⁰ Waste heat from the turbines is used to produce steam, which in turn is used to generate electricity. This considerably improves the efficiency of the system. *ibid*.

¹³¹ The Carbon Tax on emissions for the continental shelf, the introduction of energy management systems and modifications to energy-intensive equipment, has been an incentive to improve energy efficiency. Act of 13 June 1975 No. 35 relating to the Taxation of Subsea Petroleum Deposits, etc. Last amended by Act of 29 June 2007 No. 51 (Norwegian Petroleum Taxation Act).

¹³² An evaluation of the option of using power from shore rather than gas turbines to provide electricity to oil and gas platforms must be included in all proposals for new field developments or large-scale modification of existing facilities. Norwegian Pollution Control Act.

¹³³ NO_x refers to the sum of nitrogen oxide (NO) and nitrogen dioxide (NO₂). Both contribute to acidification. The main sources of NO_x emissions are the same as for CO₂: gas combustion in turbines, gas flaring and diesel consumption. The level of emissions depends both on the technology used and on fuel consumption. These are regulated by the Gothenburg Protocol, and are included in permits under the Norwegian Pollution Control Act. ECOSOC, Economic Commission for Europe, Guidance documents and other methodological materials for the implementation of the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (adopted 30 November 1999, entered into force 17 May 2005) 1480 UNTS 215 (Gothenburg Protocol).

¹³⁴ Produced water, drill cuttings and residues of chemicals and cement from drilling operations are the main components discharged to the sea. These discharges to the sea are regulated at National level through the aforesaid permits, and at International level through the Convention for the Protection of the Marine Environment of the North-East Atlantic (adopted 22 September 1992, entered into force 25 March 1998) 2354 UNTS 67 (OSPAR) <<http://www.ospar.org/convention>> accessed 28 December 2015

¹³⁵ "Abbreviation for Non-methane volatile organic compounds. Organic chemical compounds, excluding methane, that under normal conditions can vaporise and enter the atmosphere." European Environmental Agency <<http://www.eea.europa.eu/themes/air/air-quality/resources/glossary/nmvocs>> accessed 30 December 2015

¹³⁶ Norwegian Legal Framework, Climate and Environment section <<http://www.norskipetroleum.no/en/framework/climate-and-environment/>> accessed 29 December 2015

All of the above together with an obligation for preparedness and response to deal acute pollution¹³⁷ on one hand, and the obligation of licensees to present a thorough decommissioning plan,¹³⁸ has put Norway on a clear path to attain a sustainable approach for offshore petroleum development.

2.4.2. UK Petroleum Conservation Legal Framework

In the UK rights over petroleum are vested on Her Majesty.¹³⁹ This applies to the petroleum (including petroleum in Crown Land) that exists in its natural condition in the strata in Great Britain or beneath the territorial sea adjacent to the UK. The Secretary of State on behalf of Her Majesty, is in charge of regulation and grants licenses to search and bore for and get petroleum.¹⁴⁰

In addition to the UK unitization provision examined above, emission standards and environmental protection are seminal concepts identified throughout the UK petroleum framework.¹⁴¹ Further principles of international law, such as the precautionary principle¹⁴² and the polluter pays principle¹⁴³ are

¹³⁷ To limit the impact of any acute pollution, Norway has private, municipal and governmental oil spill preparedness and response services. As stated in the Norwegian Pollution Control Act, operators are obliged to maintain a level of proportional preparedness and response to deal acute pollution from their activities. Being responsible for dealing with acute pollution resulting from their own activities, operators are obliged to maintain an appropriate level of emergency preparedness and response.

¹³⁸ Cessation of petroleum activities and decommissioning are regulated under Chapter 5 of the Norwegian Petroleum Act and Chapter 6 of the Petroleum Regulations. As a general rule, between two and five years before the production license expires, is relinquished or the use of a petroleum installation will be terminated permanently, licensees are required to submit to the Ministry a decommissioning plan. This plan comprises on one hand an impact assessment, which must provide an overview of possible environmental impact of shutdown process, and on the other hand, a detailed plan for closing down and decommissioning of the installations.

¹³⁹ Petroleum Act 1998 (UK Petroleum Act) Part 1(1) "Her Majesty has the exclusive right of searching and boring for and getting petroleum..."

¹⁴⁰ The Statutory Regime, Oil and Gas UK Environmental Legislation

<<http://oilandgasukenvironmentallegislation.co.uk/contents/pages/statutory.htm>> accessed 31 December 2015

¹⁴¹ Traditionally international environmental legislation has focused on the development and reduction of specific emission standards. Under UK environmental law we can identify this double approach - prescriptive and goal setting. For example, see the recent Merchant Shipping (Prevention of Oil Pollution) Regulations 1996, SI 1996/2145. *ibid*.

¹⁴² The precautionary principle was adopted at the Third North Sea Conference 1990. Further, the concept is also included in the OSPAR Convention.

¹⁴³ The principle is used to describe the commonly accepted practice that those who produce pollution should bear the costs of environmental degradation. Graham Research Institute and D Clark, 'What is the 'Polluter Pay's Principle?' *The Guardian* (2 July 2012) <<http://www.theguardian.com/environment/2012/jul/02/polluter-pays-climate-change>> accessed 20 January 2016; Principles of EU Environmental Law – Polluter Pay's Principle, European Commission – European Environmental Agency Workshop on EU Legislation (2012)

<http://ec.europa.eu/environment/legal/law/pdf/principles/2%20Polluter%20Pays%20Principle_revised.pdf> accessed 20 January 2016. See, for example, V de Lucia, 'Polluter pays principle', *The EoE* (2013) <<http://www.eoearth.org/view/article/155292>> accessed 25 January 2016

also reflected in the EU Directive on Environmental Liability 2004/35/EC. IPC¹⁴⁴ is enacted in the Pollution Prevention and Control Act 1999 (PPC Act) and BPEO¹⁴⁵ is employed in licensing the disposal of waste at sea as regulated by the Food and Environmental Protection Act 1985. The BAT¹⁴⁶ and BEP¹⁴⁷ are also regulated under OSPAR in Appendix 1 and in EU legislation. The SEA Directive¹⁴⁸ and the EIA Directive¹⁴⁹ are also widely considered. The SEA Directive establishes the type of information to be included in the environmental report of Strategic Environmental Assessment. The DECC acts as the main regulator of the offshore oil and gas industry, and has taken a proactive role on the use of SEA.¹⁵⁰ The DECC is also responsible for energy and climate change policy.¹⁵¹

Regarding energy efficiency, UK on one hand is bound by the international climate change framework, including Kyoto Protocol and related instruments and the EU efficiency targets to reduce greenhouse gas emissions as stated in the Energy Roadmap 2050, and on the other by several national documents which set

¹⁴⁴ Concept developed out of the acknowledgment that an integrated approach to pollution control was needed in order to minimize damage to the environment as a whole. EU Directive on Integrated Pollution Prevention and Control 96/61/EC (IPPC Directive).

¹⁴⁵ The concept of BPEO derived from the awareness of the need for coordinated pollution control. BPEO requires to take into account the practicality of all reasonable options and its environmental impact. Best Practicable Environmental Option, Royal Commission on Environmental Pollution Canada (BPEO Twelfth Report, 1988) Cm 310 <http://www.agriculturedefensecoalition.org/sites/default/files/file/canada_52/52H_2011_Royal_Commission_23_Report_Listings_on_Environmental_Pollution_Website_July_28_2011.pdf> accessed 20 January 2016

¹⁴⁶ BAT means “the latest stage of development (state of the art) of processes, of facilities or of methods of operation which indicate the practical suitability of a particular measure for limiting discharges, emissions and waste”. OSPAR Appendix I.

¹⁴⁷ BEP means “the application of the most appropriate combination of environmental control measures and strategies”. *ibid.*

¹⁴⁸ SEA is defined as “the formalized, systematic and comprehensive process of evaluating the environmental impacts of a policy, plan or programme and its alternatives”. European Directive 2001/42/EC on the Assessment of the Effects of Certain Plans and Programmes on the Environment (SEA Directive/SEA). Concepts also included under UK legislation: Environmental Assessment of Plans and Programmes Regulations 2004 (Statutory Instrument 2004 No.1633), Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 (Statutory Rule 2004 No. 280), Environmental Assessment of Plans and Programmes (Scotland) Regulations 2004 (Scottish Statutory Instrument 2004 No. 258), and Environmental Assessment of Plans and Programmes (Wales) Regulations 2004 (Welsh Statutory Instrument 2004 No. 1656 (W.170). Practical Guide to the SEA Directive, Office of the Deputy Prime Minister (Scotland September 2005) <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf> accessed 31 December 2015

¹⁴⁹ EIA Directive (refer to Review of the EIA Directive).

¹⁵⁰ SEA also applies to the licensing rounds of the offshore oil and gas sector. Offshore Energy Strategic Environmental Assessment: An overview of the SEA Process from the Department of Energy & Climate Change (First published 16 May 2013, last updated 1 December 2015).

¹⁵¹ A guide to DECC, Why was DECC created? at <<http://www.uswitch.com/gas-electricity/guides/decc/#step5>> accessed on 31 December 2015

out energy efficiency policies and initiatives.¹⁵² UK is part of the CCS Association for diminishing atmospheric emissions of CO₂ and dealing with climate change.¹⁵³ Also as member of the IPPC regulatory system, it is also bound by the energy requirements to improve energy efficiency and reduce carbon dioxide emissions. Other relevant incentives include Climate Change Agreements or Umbrella Agreements between the Environment Agency and the UK industry to reduce energy use and CO₂ emissions, which in return operators receive discounts on CCLs.¹⁵⁴

The UK Conservation and Biodiversity legislation¹⁵⁵ regulates offshore marine conservation. It overall protects the conservation of natural habitats and covers related topics such as offences, penalties, protecting measures, surveillance and monitoring duties, and licensing process. Offshore treatment of waste is also widely regulated.¹⁵⁶ Accordingly the EIA Directive and the UK public participation legislation¹⁵⁷ aim to ensure that regulators make decisions with full knowledge of the significant effects on the environment when granting oil and gas licenses. Finally, sustainable development initiatives are broadly reflected in the UK Sustainable Development Strategy.¹⁵⁸

¹⁵² See, for example, documents such as the Climate Change Act or The Energy Act 2011. Also see Energy Efficiency Policies and Measures in the UK <<http://www.odyssee-mure.eu/publications/national-reports/energy-efficiency-united-kingdom.pdf>> accessed 30 December 2015

¹⁵³ Carbon Capture and Storage Association <<http://www.ccsassociation.org/what-is-ccs/>> accessed 31 December 2015

¹⁵⁴ Guidance on Climate Change Agreements Part of Climate Change Agreements and Climate Change and Energy.

¹⁵⁵ Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 as amended by the Offshore Marine Conservation (Natural Habitats, &c.) (Amendment) Regulations 2012, Offshore Marine Conservation (Natural Habitats, &c.) (Amendments) Regulations 2009, Offshore Marine Conservation (Natural habitats, &c.) (Amendments) Regulations 2010, Offshore Marine Conservation (Natural Habitats, &c.) (Amendment) Regulations 2012, Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2011, Conservation of Habitats and Species (Amendment) Regulations 2011, Conservation of Habitats and Species (Amendment) Regulations 2012, Offshore Petroleum Activities (Conservation of Habitats) (Amendment) Regulations 2007, Offshore Petroleum Activities (Conservation Habitats) Regulations 2001. Oil & Gas UK Legislation Index <http://oilandgasukenvironmentallegislation.co.uk/contents/topic_files/onshore/offshore-conservation.html> accessed on 31 December 2015

¹⁵⁶ Included but not limiting to Offshore Chemicals Regulations 2002, Offshore Marine Conservation (Natural Habitats &c.) Regulations 2007, Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005 as amended, Petroleum Act 1998, Conservation of Habitats and Species Regulations 2010 as amended, Energy Saving Opportunity Scheme Regulations 2014, Offshore Combustion Installations (Pollution Prevention and Control) Regulations 2013, Offshore Installations (Offshore Safety Directive) (Safety Case etc.) Regulations 2015, Offshore Production and Pipelines (Assessment of Environmental Effects) Regulation 1999 as amended, Offshore Petroleum Activities (Conservation Habitats) Regulations 2001, Offshore Petroleum Activities (Conservation of Habitats) (Amendment) Regulations 2007, Offshore Petroleum Licensing (Offshore Safety Directive) Regulations 2015, Petroleum Licensing (Applications) Regulations 2015.

¹⁵⁷ Data Protection Act 1998, Environment Impact Assessment (Scotland) Amendment Regulation 2009, Environment Impact Assessment (Scotland) Regulation 1999, Environment Information (Scotland) Regulation 2004, Freedom of Information Act 2000, Marine Works (Environment Impact Assessment) Regulation 2007 as amended and the Gas Act 1986. *ibid.*

¹⁵⁸ The UK policy document on sustainable development "Securing the Future" includes:

2.4.3. Trinidad and Tobago Petroleum Conservation Legal Framework

Contrary to the vast and detailed municipal laws and regulations found in the Norway and UK legal system, T&T provides a less broad framework. The President of T&T is vested to enact general regulations as “he considers necessary for the purposes of fixing petroleum conservation rules.”¹⁵⁹ Petroleum rights are assigned to the State. Licensees must “ensure that operations do not unreasonably interfere with other activities in the area and, in the case of operations in submarine areas, care shall be taken to avoid pollution of the seas, beaches or tidal rivers to ensure that navigation, agriculture, fishing, authorized scientific researches, and conservation of the living resources of the sea are not unjustifiably hindered.”¹⁶⁰

EAM 2000 deals with the goals of EIA, public information and public participation through the Public Comment Process and Environmental Education Program. The 2011 National Climate Change Policy¹⁶¹ provides the basis for the

“The goal of sustainable development is to enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life, without compromising the quality of life of future generations. For the UK Government and the Devolved Administrations, that goal will be pursued in an integrated way through a sustainable, innovative and productive economy that delivers high levels of employment; and a just society that promotes social inclusion, sustainable communities and personal wellbeing. This will be done in ways that protect and enhance the physical and natural environment, and use resources and energy as efficiently as possible.” UK Government Sustainable Development Strategy <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69412/pb10589-securing-the-future-050307.pdf> accessed 12 December 2015

The UK first developed a National Strategy for Sustainable Development (NSDS) in 1994, after the 1992 Rio UN Conference on Environment and Development and the adoption of Agenda 21. The UK published revisions of the NSDS in 1999 and 2005. The governmental pursuit of sustainable development was originally set out in the white paper “This Common Inheritance” (HM Government 1990), and has since been re-presented in three successive UK sustainable development strategies (Sustainable Development, the UK Strategy, 1994; A Better Quality of Life, 1999; Securing the Future, 2005). Also in 2005, the UK Government and Devolved Administrations published a shared framework for sustainable development in the UK, including common goals and challenges for England, Scotland, Wales and Northern Ireland, and five shared principles: (1) Living Within Environmental Limits; (2) Ensuring a Strong, Healthy and Just Society; (3) Achieving a Sustainable Economy; (4) Using Sound Science Responsibly; and (5) Promoting Good Governance. In February 2011, the Coalition Government published “Mainstreaming sustainable development - The Government’s vision and what this means in practice”. It includes a package of measures to deliver it through the Green Economy, action to tackle climate change, protecting and enhancing the natural environment, fairness and improving wellbeing, and building a Big Society. Ministers have agreed an approach for mainstreaming sustainable development which in broad terms consists of providing Ministerial leadership and oversight, leading by example, embedding sustainable development into policy, and transparent and independent scrutiny. The 2011 UK Government’s vision covers all three parts of sustainable development – the economy, society and the environment. “Mainstreaming sustainable development - The Government’s vision and what this means in practice”. Department for Environment, Food and Rural Affairs (1 February 2011) <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/183409/mainstreaming-sustainable-development.pdf> accessed 1 February 2016

¹⁵⁹ Act 46 of 1969 (T&T Petroleum Act) 29 (1)(i).

¹⁶⁰ *ibid* 42 (2)(c).

¹⁶¹ Existing national policies and legislation that have some relevance to climate change include National Environmental Policy (2006), National Policy and Programmes on Wetland Conservation for T&T (2001), National Protected Areas Policy (2011), National Forest Policy (2011), National Tourism Policy (2010), Environmentally Sensitive Areas Rules (2001), Draft

Reduction of Greenhouse Gas (GHG) Emissions in the Electrical Power Generation, Industry and Transport Sectors over the 2013-2040 horizons. This document establishes policy goals for the reduction of energy consumption and the increase of energy efficiency initiatives and clean technologies, such as cogeneration. Further, it also establishes the goal of reducing venting and flaring.¹⁶² The national strategy for pollution control sets limits on pollution and performance standards that require existing industry to set pollution control to the best practicable technology and to upgrade facilities to the best available techniques. The waste management goals are also based on the principles of reduction, reuse and recycling.

Similar to Norway and UK conservation laws, enhanced recovery and unitization is also included; “where at any time during the currency of a license the Minister finds that the strata in the licensed area, in whole or in part, form part of a single reservoir in respect of which other licences are in force, and the Minister considers that it is in the public interest, in order to secure the maximum ultimate recovery of petroleum and to avoid unnecessary competitive drilling, that the reservoir should be worked as a unit with the co-operation of all concerned.”¹⁶³

Alike UK and Norway, the overall objective of Trinidad and Tobago’s environmental policy is also focused towards achieving sustainable development goals.¹⁶⁴ To this end, the 2006 NEP established the goal of energy efficiency through the implementation of energy conservation and energy efficiency programs, the offset of CO₂ production against the carbon sequestration capacity of eco-systems, and the enforcement of rehabilitation programmes to discourage waste of resources such as oil and gas.¹⁶⁵

Waste Management Rules (2008) and Water Pollution Management Programme (2005) and Certificate of Environmental Clearance Rules (2001). T&T National Policy on Climate Change 2011, 14.

¹⁶² Strategy for the reduction of emissions in T&T 2040. Action Plan for the mitigation of GHG emissions in the electrical power generation, transport and industry sectors (August 2015) 63.

¹⁶³ T&T Petroleum Act s 43 (t).

¹⁶⁴ Sustainable development, meaning “the balance of economic growth with environmentally sound practices in order to enhance the quality of life and meet the needs of present and future generations.” T&T National Environmental Policy 2006 s 2(1).

¹⁶⁵ T&T National Environmental Policy 2006 Chs 2 (3)(8), 3(9), 4.

2.5. Conclusions

To a degree, conservation depends on the geophysical characteristics of a reservoir, any effort to assess and or formulate an appropriate legal framework either at the municipal or international level must at a minimum take full consideration of the migratory nature of hydrocarbons. The mere fact that oil and gas migrates creates potential property rights difficulties. Even the most efficient production method cannot guarantee that oil and gas will not migrate either within a reservoir that lies across numerous licenses or to a neighboring reservoir. Optimum petroleum recovery rarely falls within defined demarcations or boundary lines. The economic efficiency of hydrocarbons development is highly dependent on: (1) the permeability characteristics of the reservoir rock and the amount of the oil and gas seized within the reservoir; (2) the precise location of the drilling activities for optimum recovery; and (3) the enable rate of production, all of which have historically created complex legal issues.

To some scholars, the greatest failing of optimum recovery practices is the fact that the migratory nature of hydrocarbons is not fully recognized early in the production life of a reservoir. Although the rule of capture has been limited, but not completely eliminated by conservation laws and regulations, mandatory pooling, enhanced recovery and unitization practices are often not included in the initial phase of production. Further, conservation regulations and practices must also adapt to the new combined use of the techniques of hydraulic fracturing, horizontal drilling, and micro seismic monitoring, and appropriate regulation must not inadvertently lead to waste, especially underground waste.¹⁶⁶

Although there is no doubt by scholars that the ultimate economic conservation tool is unitization, conservation laws need to be more precise in providing correlative rights to a common source of supply. Equitable solutions to provide a fair share of production must be further develop. To set accurate estimation and equitable apportionment, conservation agencies must promote further the use of technical data and exploratory drilling especially during the early stages of development. Being estimation and apportionment so speculative,

¹⁶⁶ Anderson (n 7).

correlative rights must not only provide a fair opportunity to develop but also include a clear mechanism for equitable distribution.

Furthermore, sustainability relating to marine protection, climate, energy efficiency and public participation provides a tangible opportunity to revisit existing petroleum conservation practices. Current trends in sustainability must not be ignored. Sustainable development now plays a fundamental role in the formulation of petroleum laws. Provisions of sustainable development found in the petroleum laws of Norway, UK and Trinidad and Tobago must transcend to international instruments, including to the formulation of international framework agreements for the development of THRs. The overall achievement of sustainable development provides an ongoing challenge to petroleum conservation. Nowadays, there is absolutely no doubt that petroleum conservation involves a balancing of present development against the preservation of resources for the future, a principle that must be applied at a local and international level.

Chapter 3. Internationalization of Transboundary Hydrocarbon Resources

3.1. Introduction

Under UNCLOS when hydrocarbons straddle a maritime boundary or are found in areas of overlapping claims, States are subject to principles of cooperation, to act in good faith, and to make every effort to find an equitable solution.¹ Although the concept of joint development of THRs is not explicitly regulated in UNCLOS or in related international legal instruments,² State practice have long considered the execution of joint development agreements as a valuable practical alternative to THRs. For pragmatic reasons States have resorted to joint development agreements before, during and after final delimitation of maritime boundaries.³ However, it remains whether the law of the sea has developed comprehensive rules requiring States to adopt sufficient conservation measures to ensure sustainable development and the avoidance of resource waste, whilst providing sufficient protection to the environment.

This chapter analyses the joint development of THRs under international law. It begins by examining the purpose of joint development in what concerns the sustainable development of THRs and the adoption of conservation

¹ UNCLOS arts 74(1)(3) and 83 (1)(3). Also, see V Becker-Weinberg, *Joint Development of Hydrocarbon Deposits in the Law of the Sea* (Springer – Verlag Heidelberg 2014) vol 30, 6.

² Relevant to this Chapter is the study of the Geneva Conventions on the Law of the Sea: the Convention on the High Seas (adopted 29 April 1958, entered into force 30 September 1962) 450 UNTS 11, the Convention on the Continental Shelf (adopted 29 April 1958, entered into force 10 June 1964) 7302 UNTS 499, the Convention on the Territorial Sea and Contiguous Zone (adopted 29 April 1958, entered into force 10 September 1964) 516 UNTS 205; the Convention on Fishing and Conservation of the Living Resources of the High Sea (adopted 29 April 1958, entered into force 20 March 1966) 559 UNTS 285, and the Optional Protocol of Signature concerning the Compulsory Settlement of Disputes (adopted 29 April 1958, entered into force 30 September 1962) 450 UNTS 169.

³ THRs create complex legal issues if it underlies the territory of two or more different States. At the time of discovery three different factual scenarios may exist: (a) States have entered into a definitive agreement that governs the manner in which a transboundary hydrocarbon deposit will be jointly developed; (b) States have entered only a delimitation agreement with respect to the boundary that addresses the existence of transboundary hydrocarbon deposits in a non-definitive way; or (c) States have no delimitation agreement in place and/or dispute the boundary. With respect to the first scenario, such definitive agreement or bilateral treaty would be considered the primary source of international law governing the development obligations of the States concerned. P Weems and A Fallon, 'Strategies for Development of Cross-Border Petroleum Reservoirs' (May 2012) King & Spalding - Energy Newsletter

<<http://www.kslaw.com/library/newsletters/EnergyNewsletter/2012/May/article2.html>> accessed 2 February 2016

measures, such as unitization. It provides an assessment of the rights of coastal States to explore and exploit THRs within defined boundaries. It does not, however, examine the rights and duties of States in areas of overlapping claims nor the rights of States to exploit resources that lie across the Area and limits of national jurisdiction. Essentially it examines whether treaty practice produced by JDAs regarding petroleum conservation measures is sufficiently consistent and uniform and what legal assumptions can be drawn.

Part III examines the internationalization of shared natural resources. It looks at the UNEP Guidelines and the UN Resolutions governing shared natural resources and its impact to THRs development. Part IV provides a summary of the relevant principles of sustainable development and particularly how they promote the conservation of THRs, whether directly or indirectly. The analysis is based on the three fundamental pillars of sustainable development: -environmental protection, economic stability and social sustainability. Part V reviews the different attempts to propose universal rules and to standardize State practice concerning THRs. It examines the work of the ILC regarding THRs and summarizes the different attitudes of States towards codification of THRs. It also looks at the work of the BIICL and the initiatives from scholars to standardize practice and implement universal rules. Part VI concludes.

The overall purpose of the Chapter is to examine the legal framework applicable to offshore THRs, taking into consideration all rules and principles, whether hard or soft law, provided in international law that directly or indirectly promote the sustainable development of THRs. The above with the objective to determine how future Framework Agreements should harmonize petroleum conservation principles.

3.2. Joint Development of THRs

JDAs can be defined as cooperative ventures between two or more States for the exploration and exploitation of hydrocarbon resources that straddle a maritime boundary or are found in areas of overlapping claims. Vasco Becker-Weinberg defines joint development agreements “as self-regulating conventional instruments subject to international law, signed between two or more States holders of a legal title, although independent of such rights as claimed by the

intervening States, concerning the maritime areas where natural resources are found in the seabed and marine subsoil, as well as undertaking of all activities deemed necessary without foregoing the rights and freedoms of third States granted under international law.”⁴ Under UNCLOS and customary international law, for the purpose of exploring or exploiting THRs coastal States exercise sovereign rights in its EEZ⁵ or continental shelf, including beyond 200 nm.⁶ Despite these rules being clear and simple, due to the migratory nature of hydrocarbons across the different maritime areas⁷, three jurisdictional problems may arise: (1) issues around development rights of an offshore hydrocarbon deposit that straddles a defined boundary line; (2) development rights to an offshore hydrocarbon deposit found in a maritime area that is claimed by two or more States; and (3) access to hydrocarbon resources that straddle national jurisdiction and the international Area.

For pragmatic reasons States have long developed joint development agreements in their practice, a concept that was first applied to the management of fisheries⁸ and also to the development of onshore resources.⁹ Predominantly driven by national interests and economic goals, joint development agreements can be described as a cooperative effort for the internationalization of shared

⁴ Becker-Weinberg (n 1) 5.

⁵ art 56(1)(a).

⁶ *ibid* art 77(1).

⁷ Under international law maritime areas are legally structured in geographical areas that are subject to State jurisdiction and, other areas that are beyond State jurisdiction and consequently cannot be claim to any State. Maritime areas that are subject to state jurisdiction include the territorial sea (UNCLOS art 2), internal waters (UNCLOS art 8) and international straits (UNCLOS art 34), archipelagic waters of an archipelagic state (UNCLOS art 46), the contiguous zone (UNCLOS art 33), the EEZ (UNCLOS art 55), and the continental shelf (UNCLOS art 76). The areas that are beyond State jurisdiction and consequently cannot be claim to any State include the high seas (UNCLOS art 86) and the international Area (UNCLOS art 133). As such, it is necessary to determine the rights and obligations of States under the legal regimes applicable in the different maritime areas. Convention on the Law of the Sea of 10 December 1982 (adopted 28 July 1994, entered into force 28 July 1996) 1833 UNTS 3 (UNCLOS).

⁸ For examples of international agreements that introduced rules of conduct for fishing operations see K Bangert, ‘The effective enforcement of high seas fishing regimes: the case of the Convention for the Regulation of the Policing of the North Sea Fisheries of 6 May 1882’ in Goodwin-Gill G and Talmon S (eds), *The Reality of International Law: Essays in Honour of Ian Brownlie* (Clarendon Press Oxford 1999) 1-20; K Beauchamp, ‘The management function of ocean boundaries’ (May-June 1986) 23 (3) SDLR 644-647.

⁹ Agreement between the Government of the Czechoslovak Republic and the Austrian Federal Government concerning the Principles of Geological Co-operation (Prague 23 January 1960) 495 UNTS 7241, 112-122 and Agreement between the Government of the Czechoslovak Republic and the Austrian Federal Government concerning the Working of Common Deposits of Natural Gas and Petroleum (Prague 23 January 1960) 495 UNTS 7242, 134-140. Overall these agreements include duties to exchange geological information and coordinate extraction operations in areas close to the borders.

natural resources between two or more States, or between two or more States and the international Area for the exploration and exploitation of offshore hydrocarbon deposits that straddle boundary lines or that are found in maritime areas of overlapping claims. As explained in the following sections joint development regimes are fundamentally a pragmatic venture that exclusively takes into account State's discretion to undertake development activities. They are not a direct result of an international obligation requiring States to develop THRs. To an extent States are only bound to specific international obligations pending and during the implementation of a joint development regime. These include, inter alia, obligations of mutual restraint and to share information, and of due regard for the sovereignty and sovereign rights of other States.

3.2.1. Sovereignty, Sovereign Rights and Jurisdiction of Coastal States

From the origins of the Truman Proclamation¹⁰ and the Continental Shelf regime sovereign rights of coastal States to explore and exploit its seabed resources have been both inherent and exclusive. This not only to limit the sphere of influence and domain of coastal States, but also as a protectionist method to ensure exclusivity over exploitation of such resources. This concept was widely confirmed under Article 2(2) of the Convention on the Continental Shelf and Article 77(2) of UNCLOS. To Brownlie the nature of these exclusive rights prevents them from being lost to another State in the absence of a specific agreement to the contrary.¹¹ If a coastal State has not explored or exploited its continental shelf resources, no other State may do so without its express consent. These sovereign rights¹² do not depend on occupation, express or notional, by the coastal States. "International law assumes that sovereign rights to exploit natural resources on the seabed and subsoil extending to at least 200 nautical miles from the baseline, and possibly to

¹⁰ Policy of the United States with respect to the Natural Resources of the Subsoil and Seabed of the Continental Shelf (28 September 1945) Proclamation N.2667, 10 Fed. Reg. 12,303 (Truman Proclamation); "The Truman Proclamation adopted the criteria of contiguity of the continental shelf, thus recognizing the right of every coastal State to exercise jurisdiction and control over this maritime space and the natural resources found therein, as well as preventing States from consolidating their sovereignty claims based on the appropriation of the seabed and subsoil and the development of its natural resources." Becker-Weinberg (n 1) 30.

¹¹ 'Principles of Public International Law' (5th ed, 1998) 215 cited in D Ong, *Joint Development of Common Offshore Oil and Gas Deposits: "Mere" States Practice or Customary International Law?* (1999) 93 AJIL 771, 774.

¹² UNCLOS art 81 was the key to confirm these rights because it granted coastal states the exclusive right to explore by drilling on the continental shelf.

the edge of the continental margin, are allocated among the coastal States of the world, and cannot be lost through neglect”¹³

In the North Sea Cases, the ICJ confirmed such notion by stating that the continental shelf constitutes a natural prolongation of the territorial land of a coastal State, and therefore its sovereign rights exist *ipso facto* and *ab initio*.¹⁴ For Becker-Weinberg, “this means that if a coastal State chooses not to explore and exploit the non-living resources and the sedentary species found in the continental shelf, no other State may do so without the latter’s consent. This is also similar to coastal States’ exclusive right to drill in the continental shelf, which was not included in the 1958 Convention on the Continental Shelf.”¹⁵ Article 2 (2) of the Convention on the Continental Shelf expressly mentions that the rights over the continental shelf for the purpose of exploiting its natural resources “are exclusive in the sense that if the coastal State does not explore the continental shelf or exploit its natural resources, no one may undertake these activities, or make a claim to the continental shelf without express consent of the coastal States.”¹⁶ A significant intrinsic right as no occupation, in an effective or notional way, or express valid proclamation is needed. In the *Libya-Malta Case* the ICJ recognized the concept of continental shelf as part of customary international law. Each coastal State, whether or not a signatory to UNCLOS, is entitled to 200 nautical mile of continental shelf, regardless of whether the shelf is continuous or extended.¹⁷

¹³ D Ong, *Joint Development of Common Offshore Oil and Gas Deposits: “Mere” States Practice or Customary International Law?* (1999) 93 AJIL 771, 775.

¹⁴ *North Sea Continental Shelf (Republic of Germany / Netherlands)* Judgment (20 February 1969) ICJ Reports 1969, paras 18-20 <<http://www.icj-cij.org/docket/index.php?sum=295&code=cs2&p1=3&p2=3&case=52&k=cc&p3=5>> accessed 10 December 2015

¹⁵ Becker-Weinberg (n 1) 33, 34.

¹⁶ art 2 (2) of The UN Convention on the Continental Shelf (adopted 29 April 1958, entered into force 10 June 1964) 7302 UNTS 499.

¹⁷ *Continental Shelf case (Libya Arab Jamahiriya – Malta)*, Judgment (14 April 1981) ICJ Reports 1981 <<http://www.icj-cij.org/docket/index.php?sum=633&code=tl&p1=3&p2=3&case=63&k=c4&p3=5>> accessed 9 December 2015; UNCLOS addresses the delimitation of the EEZ and the continental shelf between coastal States. The Convention determines that any limits shall be affected by an agreement on the basis of international law in order to reach an equitable solution. If no agreement is reached, States are required in the spirit of cooperation to make every effort to enter into provisional arrangement, and not to jeopardize or hamper the reaching of a final agreement, and such an arrangement shall be without prejudice to reaching final delimitation. UNCLOS arts 74(1)(3) and 83 (1)(3).

Under international law resources found in the seabed and subsoil of the territorial sea¹⁸ or archipelagic water¹⁹ are subject to full State sovereignty²⁰. In its exclusive EEZ²¹ or continental shelf²², States exercise functional limited sovereign rights. As described by Becker-Wienberg “if one moves from the internal waters and territorial sea through the EEZ and continental shelf onto the high seas and in the Area, the strength and scope of the coastal State’s jurisdiction decreases.”²³ Article 76 (1) and (5) of UNCLOS determines this *ipso facto* extension of the continental shelf.²⁴ However, States have sovereign rights over the continental shelf for exploiting its natural resources.²⁵ Further, States may establish, beyond and adjacent to its territorial sea, an EEZ²⁶ with a length of up to 200 nm where they also have sovereign rights for exploration and exploitation, conservation and management purposes of both living and non-living natural resources including those found in the subsoil.²⁷ Finally, coastal States also have rights for the purpose of construction, operation and usage of artificial islands, installations and structures in the EEZ and on their continental shelf.²⁸ For purposes of petroleum development, under UNCLOS the rights of States over the continental shelf do not affect the legal status of superjacent waters and air space above those waters or the rights and freedoms of other States, such as the right to lay submarine cables

¹⁸ UNCLOS art 2(2).

¹⁹ *ibid* art 49(2).

²⁰ *Continental Shelf case (Tunisia/Libyan Arab Jamahiriya)*, Judgment (24 February 1982) ICJ Reports 1982, 104 states: “The fact that a given area is territorial sea or internal waters does not mean that the coastal State does not enjoy “sovereign rights for the purpose of exploring it and exploiting its natural resources”; it enjoys those rights and more, by virtue of its full sovereignty over that area”. Becker-Weinberg (n 1) 24.

²¹ UNCLOS art 56(1)(a).

²² *ibid* art 77(1).

²³ Becker-Weinberg (n 1) 24. Also see, for example, P Birnie, A Boyle and C Redgwell, *International law and the environment* (3rd ed, OUP 2009).

²⁴ “The fixed points comprising the line of the outer limits of the continental shelf on the seabed (...), either shall not exceed 350 nautical miles from the baselines from which the breadth of the territorial sea is measured or shall not exceed 100 nautical miles from the 2,500 metre isobath, which is a line connecting the depth of 2,500 meters.” UNCLOS art 76(5).

²⁵ Becker-Weinberg comments that “Art 1 of the 1958 Convention on the Continental Shelf provides that the delimitation of the outer limits of the continental shelf would correspond to the seabed and subsoil of the adjacent submarine areas of the coastal states until the depth of 200m or beyond which the development of natural resources could be carried out.” Becker-Weinberg (n 1) 32. Also see, for example, UNCLOS art 77(1).

²⁶ Becker - Weinberg comments that “the EEZ is a maritime area extending up to 200 nm from the baseline. Its application is *ipso jure*, meaning that it depends on prior proclamation, although there is no obligation for a state to claim an EEZ” (n 1) 26; UNCLOS art 57.

²⁷ UNCLOS art 56 (1)(b).

²⁸ *ibid* arts 60, 80.

and pipelines, the freedom of navigation or the activities regarding international cooperation and promotion of marine scientific research.²⁹ Further, under UNCLOS the rights of the coastal States with regards to the exploration and exploitation of mineral resources are exclusive.³⁰

However, maritime areas beyond territorial sovereignty, like the EEZ and the continental shelf are only regulated and limited to those matters expressly mentioned under UNCLOS. To Becker-Weinberg “the exercise of the right of coastal States to develop resources in the EEZ and the continental shelf should not be considered as being part of their territorial sovereignty, since the EEZ and the continental shelf are not part of the coastal State’s territory.”³¹ The EEZ has been defined as a “separate functional zone of a sui generis character”³² compared with the territorial sea and the high seas.³³ To Churchill and Lowe, the EEZ “combines characteristics of the territorial sea and the high seas, but cannot be assimilated to either. It is a sui generis zone with its own distinctive regime. (...) It is an amalgam, or ‘multifunctional’ zone, in which coastal States enjoy sovereign rights in relation to economic resources, and also for certain other matters including environmental protection.”³⁴ The rights of coastal States in the EEZ shall be considered as preferential rights³⁵ for the sake of development of natural resources. This reference to sovereign rights should “not be viewed in the same light as the rights exercised in the territorial sea or the sovereignty rights referred in the continental shelf regime.”³⁶

²⁹ *ibid* Part XIII.

³⁰ *ibid* art 77(1).

³¹ Becker-Weinberg (n 1) 24, 25.

³² *ibid* 26.

³³ The concept of the EEZ emerged as a result of state practice and was later developed in UNCLOS. Nonetheless, as a memorandum from the president of the conference points out, the legal status of the EEZ was one of the most polemic topics during the negotiations of UNCLOS. *ibid*.

³⁴ R Churchill and V Lowe, *The Law of the Sea* (3rd edn, Juris Publishing Inc 1999) 84 cited by Becker-Weinberg *ibid*.

³⁵ UNCLOS art 56(2) states that “in exercising its rights and performing its duties under this Convention in the exclusive economic zone, the coastal State shall have due regard to the rights and duties of other States and shall act in a manner compatible with the provisions of this Convention.” In addition to that, UNCLOS arts 69 and 70 also address the rights for land-locked States and geographically disadvantaged States.

³⁶ Becker-Weinberg (n 1) 27; UNCLOS art 56(3) states that, “The rights set out in this article with respect to the seabed and subsoil shall be exercised in accordance with Part VI.” (Archipelagic States).

“Although both the EEZ and the continental shelf regimes include the seabed and subsoil for the purposes of developing natural resources, there is only exclusivity regarding the continental shelf. In the continental shelf, States are entitled to exercise the inherent and exclusive sovereign right of exploring and exploiting the non-living resources and sedentary species, save for coastal States’ explicit consent that other States may undertake similar operations.”³⁷

The EEZ provides coastal States sovereign rights, but not sovereignty, over certain activities such as exploration, exploitation, conservation and management of natural resources. Entitlement to an EEZ confers coastal States other rights for economic purposes, such as the freedom of navigation, over flight, and other lawful acts associated with the operation of ships, aircrafts, submarine cables, and pipelines that are compatible with UNCLOS.³⁸ Delimitation of the EEZ is set forth in Article 74 of UNCLOS. In order to achieve an equitable solution, it provides that the delimitation of the EEZ between States with opposite or adjacent coasts shall be effected by agreement on the basis of international law as referred to in Article 38 of the Statute of ICJ. However, if no agreement is reached within a reasonable period, States concerned shall resort to the dispute settlement procedure provided under Part XV of UNCLOS.³⁹

Regarding the rights of third states in the continental shelf and the EEZ, Article 58 (1) of UNCLOS⁴⁰ allows all States to navigate, overfly and lay submarine

³⁷ Becker-Weinberg (n 1) 3; UNCLOS art 56(1) on the rights, jurisdiction and duties of the coastal State in the EEZ; UNCLOS art 56 that stipulates “the exclusive economic zone shall not extend beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured”, UNCLOS art 76(1) defines extensively the concept of the continental shelf, and UNCLOS art 77(2) and (4) that specify “(2) The rights referred to in paragraph 1 are exclusive in the sense that if the coastal State does not explore the continental shelf or exploit its natural resources, no one may undertake these activities without the express consent of the coastal State” (4) “The natural resources referred to in this Part consist of the mineral and other non-living resources of the seabed and subsoil together with living organisms belonging to sedentary species, that is to say, organisms which, at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil”, respectively.

³⁸ UNCLOS art 58.

³⁹ If an agreement in place, then questions relating to the delimitation of the EEZ shall be determined according to the provisions of such agreement. Part XV of UNCLOS.

⁴⁰ “In the exclusive economic zone, all States, whether coastal or land-locked, enjoy, subject to the relevant provisions of this Convention, the freedoms referred to in article 87 of navigation and overflight and of the laying of submarine cables and

cables and pipelines in the EEZ. Paragraph (3) stipulates that “in exercising their rights and performing their duties under this Convention in the EEZ, States shall have due regard to the rights and duties of the coastal State and shall comply with the laws and regulations adopted by the coastal State in accordance with the provisions of this Convention and other rules of international law in so far as they are not incompatible with this Part.”⁴¹ This is the same ratio included in Article 59 of UNCLOS, whereby “in cases where this Convention does not attribute rights or jurisdiction to the coastal State or to other States within the exclusive economic zone, and a conflict arises between the interest of the coastal State and any other State or States, the conflict should be resolved on the basis of equity and in the light of all the relevant circumstances, taking into account the respective importance of the interests involved to the parties as well as to the international community as a whole.”⁴²

Despite being UNCLOS the most important legal framework regarding rights of coastal States over the EEZ and continental shelf, as evidenced in the following sections, it seems that at the time of formulation of UNCLOS sustainability and management of resources, particularly mineral resources played a secondary role. Difficulties arising from the nature of States’ sovereign rights are often intensified by the fact that coastal States are not explicitly obligated to sustainable principles, at least under the continental shelf regime. Part VI of UNCLOS does not provide comprehensive provisions regarding the sustainable development of hydrocarbons in the continental shelf.

3.2.2. Sovereignty, Property Rights and Sustainability

For Ong, “the exclusive nature of the sovereign rights of the coastal State over its continental shelf serves to exacerbate the problems associated with delimitation and managing any deposits on the shelf, especially when overlapping claims have been made”.⁴³ As discussed in the previous Chapter, under municipal laws the

pipelines, and other internationally lawful uses of the sea related to these freedoms, such as those associated with the operation of ships, aircraft and submarine cables and pipelines, and compatible with the other provisions of this Convention.”

⁴¹ UNCLOS art 58(3).

⁴² UNCLOS art 59.

⁴³ Ong, ‘Joint Development for Offshore Oil and Gas’ (n 13) 776.

migration of hydrocarbons within defined demarcations or by analogy with the law of the sea between the different maritime areas creates complex “ownership” issues.

As discussed in the previous Chapter, control over the common pool to exclude individuals through physical or legal means has been the constant tragedy haunting development of shared natural resources. Although development of natural resources appears to be exercised through the traditional institutions of private property, it is important not to disregard its potential analogy within institutions of international law, particularly for setting parameters for sustainable development. Sustainability and management of shared natural resources have created wholly new conceptual problems to the rights and duties of neighbouring States. The definitional problem of ownership over shared natural resources has become an instrument of legal regulation, as much as the object of regulation. As discussed, a comprehensive definition of property over transboundary resources should not only accommodate proprietary rights in *strictu sensu*, but a range of flexible models of collective and individuated utilization rights. Long term sustainability questions; from the definition of rights of control and access, to institutional structures for exploitation and environmental protection *per se*, constantly challenge the precise nature and limits of ownership rights to natural resources development.

The history of resources law has “often been one of strongly embedded individual rights to natural resources exercisable and defensible as proprietary rights.” Nonetheless, in today’s quest for global equality and sustainable development, introducing an element of “functional ownership” to natural resources is more than necessary. Property rights over shared natural resources cannot be seen in pure conceptual terms. Now a days conceptual and instrumental views of property to natural resources need to mutually complement. Conceptual views, as derived from Roman law categories of property law, to only define an answer to the question –what is property? Need to complement with instrumental (also called functional or utilitarian) views to determine, beyond the traditional or conceptual elements of property, the role that property plays as an institution and the social and economic goals it can promote to the sustainable

development of natural resources.⁴⁴ Ownership to transboundary resources must be seen as an aggregate of rights and duties which may be held by individuals or by a group of individuals such as communities, corporations, or governments that are guaranteed and protected by a sovereign State. Ownership to natural resources can no longer be seen as a single right but rather a bundle of rights and obligations. The balance needed between the private and social aspects of property for the sustainable developed of resources, is illustrated with great detailed by Richard Barnes in his book 'Property Rights and Natural Resources'. To Barnes, territorial sovereignty rights to natural resources development have been evolved mostly by reference to concepts of private ownership, as to an extent it mirrors the conceptual *modus operandi* of traditional private property. When sovereignty "is exercised over territory and the resources therein, it is clearly analogous to a regime of property."⁴⁵ In this basic but most important statement, international law exercises a decisive ordering function. It clearly determines ownership limits on States, essential not just to protect *suprema potestas*, but to ensure that public interests are protected from the misuse of individual power, including the progressive inclusion of sustainability.⁴⁶ To this end, the relationship between domestic law, international law and property imposes a number of duties upon how States should effectively apply principles of sustainability to the development of natural resources.⁴⁷ To Barnes, international law limits State's property institutions (eg, *sic utere tuo* principle), it is also increasingly concerned with the governance of property rights (eg, human rights and the rights of

⁴⁴ As noted by J Hamilton and N Bankes, "instrumentalists are not so concerned about what property is; they want to know what purposes the institution of property can be made to serve general functions that property as an institution might be said to fulfil." 'Different Views of the Cathedral: The Literature on Property Law Theory' in McHarg A & others (eds), *Property and the Law in Energy and Natural Resources* (OUP 2010) 8.

⁴⁵ R Barnes, *Property Rights and Natural Resources* (Hart Publishing 2009) 223. Also see, for example, *Eritrea/Yemen Arbitration*, Award of the Tribunal in the First Stage –Territorial Sovereignty and Scope of Dispute (9 October 1998) Reproduced in (1998) RIAA, vol 22, 209, 219, para 19; 317-318 para 474.

⁴⁶ On the exercise of sovereignty see, for example, M Koskeniemi, *From apology to utopia: The Structure of International Legal Argument* (CUP 2006) 192, 193.

⁴⁷ The ICJ has observed that in the absence of pertinent customary or conventional rules, direct reference should be made to the relevant general principles derived from municipal laws. *Barcelona Traction, Light & Power Co. (Belgium v. Spain)* Second Phase Judgment (5th February 1970) ICJ Reports 1970 para 33, 77.

indigenous peoples), and it may also create new property rights (eg, the deep seabed).⁴⁸

For example, following the valuable interpretation of Schrijver regarding the content of the law of the sea, it seems that the three basic pillars of sustainable development –environmental protection, economic stability and social sustainability– although without express reference to such concept,⁴⁹ are found under UNCLOS. On the management of living resources (particularly fish) in the EEZ and the High Seas the principle of “maximum sustainable yield” is well-known. Part XII of UNCLOS laid down general obligations for the protection of the marine environment, including obligations to prevent marine pollution. Under Article 192 of UNCLOS, States have the obligation to protect and preserve the marine environment. Finally, intergenerational equity is expressed in Part XI of UNCLOS, in particular Articles 136 and 137 under the principle of mankind that is applicable to the deep-sea bed activities and its mineral resources.⁵⁰

States are more and more bound to comply with sustainability measures. As rightfully stated by Ong, there is no reason why the conservation principle should not apply in the States’ territory, as well in the EEZ and the continental shelf.⁵¹ Furthermore, what is becoming a uncontested reality is that “there are multiple international law, policy, and economic perspectives that are all moving towards a similar focal point, namely, that of conservation.”⁵² References to sustainability, resource management, cooperation and conservation of natural resources by international courts and forums and the further incorporation of sustainable development into municipal laws have all helped to provide a more

⁴⁸ Barnes (n 45) 215.

⁴⁹ Sands defines this concept based on the principle of intergenerational equity (the preservation of natural resources for the benefit of future generations) and the principle of sustainable use (the exploitation of natural resources in a clever or efficient way meaning the avoidance of unnecessary waste). P Sands, *Principles of International Environmental Law* (2nd edn, CUP 2003) 253.

⁵⁰ N Schrijver, *The Evolution of Sustainable Development in International Law: Inception, meaning, and Status* (HAIL, Martinus Nijhoff Publishers 2008) vol 2, 213.

⁵¹ To Ong parallelism in this context can be utilized to argue for the extension of the conservation principle from the EEZ regime into the continental shelf regime, but even if this extension is accepted, it is arguably limited only to the conservation of the living natural resources of the continental shelf. The doctrine of parallelism traces the development of the continental shelf and EEZ regimes as two separate but co-existing and evolving legal regimes. Arts 61 and 62 of UNCLOS. D Ong, “Towards an International Law for the Conservation of Offshore Hydrocarbon Resources within the Continental Shelf?” in Freestone D & others (eds), *The Law of the Sea: Progress and Prospects* (OUP 2006) 5.

⁵² *ibid* 7.

comprehensive and overreaching interpretation of natural resources development. From the 1969 *North Sea Continental Shelf* cases to the 2007 *Guyana/Suriname* Arbitration and more recently, the 2015 *Cote D'Ivoire v Ghana* case (and others), have consistently contributed to co-operative principles for natural resources development.⁵³

3.2.3. Duty to Cooperate for the Development of THRs

The question as to whether there is a general international obligation to cooperate with respect to shared natural resources continues to attract scholars. There is enough evidence to support that a requirement to cooperate does exist. Support can be found in numerous UNGA resolutions,⁵⁴ international case law and in State practice. There are also a number of academic documents that widely support cooperation principles. Bitrus Bulama makes a valuable summary on the diverse views from scholars: Lagoni argues that the practice of negotiating and seeking an agreement for the exploration and exploitation of THRs is not “mere usage” but has given rise to a rule of customary international law.⁵⁵ On the other hand, Cameron argues that while the relevant principles of international law appear to require States to cooperate in the development of THRs, the scope of such cooperation still remains unclear. Cameron concludes that the international legal regime might therefore be better described as providing States with “rules of engagement” rather than rules of cooperation.⁵⁶ Ong states that practice alone is insufficient or too ambiguous to infer the existence of a rule of customary

⁵³ The Special Chamber of the International Tribunal of the Law of the Sea (ITLOS) in Hamburg has rejected Côte d'Ivoire's request that Ghana be ordered to suspend all oil exploration and exploitation in the disputed zone. ITLOS has ordered a number of provisional measures which both Ghana and Côte d'Ivoire are required to comply with; including continued cooperation until ITLOS gives its decision on the maritime boundary dispute which is expected in late 2017; among such provisional measures, is the need to take all necessary steps to prevent serious harm to the marine environment, including the continental shelf and its superjacent waters, in the disputed area and to pursue cooperation and refrain from any unilateral action that might lead to aggravating the dispute.

<https://www.itlos.org/fileadmin/itlos/documents/cases/case_no.23_prov_meas/C23_Order_prov.measures_25.04.2015_rig_Eng.pdf> accessed 10 October 2016

⁵⁴ See, for example, Cooperation in the Field of the Environment Concerning Natural Resources Shared by Two or More States, UNGA Res 3129 (xxviii) (13 September 1973) UN Doc A/Res/34/186, and The Charter of Economic Rights and Duties of states UNGA Res 3281 (xxix) (12 December 1974) UN Doc A/Res/29/3281, that address the cooperation in the field of environment concerning natural resources shared by two or more States.

⁵⁵ B Bitrus, 'Cross-border unitisation: what options are there for states if no agreement can be reached?' CEPMLP 10, 239.

⁵⁶ P Cameron, 'The rules of engagement: developing cross-border petroleum deposits in the North Sea and the Caribbean' (2006) 55(03) ICLQ 559, 564.

international law.⁵⁷ Ong implies that “a rule of customary international law requiring cooperation specifically with a view towards joint development or trans-boundary unitization of a common hydrocarbons deposit has not yet crystallized as (...) the essential element of ‘*opinion juris*’ remains indiscernible”.⁵⁸

However, to Ong the principle that obligates States to cooperate in terms of THRs should be constructed under two rules of customary international law: (1) to cooperate in reaching an agreement for the exploration and exploitation of THRs; and (2) in the absence of such agreement, under an obligation to exercise mutual restraint with respect to the unilateral exploitation of such resources.⁵⁹ Cameron notes that based on the existence of a boundary settlement the requirement to cooperate varies as Article 83 (3) of UNCLOS enforces the principle of cooperation among States in a limited manner.⁶⁰ This enforcement tends to be vague as there is no real hard obligation for States to cooperate in the development of THRs, but only to act in good faith, which derives from the absence to reach an agreement when disputes arise.⁶¹

3.2.3.1. Procedure for Cooperation

Three principles have been identified to guide cooperative procedures among States. These principles are: (a) the exercise of mutual restraints, (b) consultation and negotiation, and (c) good faith.⁶² Cameron defines the first procedural aspect of cooperation in terms of “the duty to exercise mutual restraints from undertaking activities within their territory or control that is capable of damaging the natural resources of the other party”.⁶³ Cameron supports this under Article 83 (3) of UNCLOS which requires States to not jeopardize or hamper the reaching of a final agreement.⁶⁴ Further, Ong considers this as an obligation to refrain from

⁵⁷ Ong, ‘Joint Development for Offshore Oil and Gas’ (n 13) 801.

⁵⁸ Ibid 803.

⁵⁹ Ibid 802.

⁶⁰ “Pending agreement as provided for in paragraph 1, the States concerned, in a spirit of understanding and cooperation, shall make every effort to enter into provisional arrangements of a practical nature and, during this transitional period, not to jeopardize or hamper the reaching of the final agreement. Such arrangements shall be without prejudice to the final delimitation.” UNCLOS art 83(3)

⁶¹ Cameron (n 56) 563.

⁶² Ibid 567.

⁶³ Ibid 565.

⁶⁴ Ibid.

unilateral actions capable of denying other States to the benefits of exercising their sovereign rights to exploitation.⁶⁵

The second procedural requirement for cooperation resides in the exchange of information, constant consultations and negotiations between States. For petroleum development this implies the use of good faith and the premise that actions from negotiating States will not represent an abuse of rights under UNCLOS. Cameron claims that such requirement to cooperate is an “open-ended” negotiation, as States are not required to conclude negotiations with a successful outcome.⁶⁶ The third procedural requirement for cooperation is the concept of ‘good faith’. The duty to conduct negotiations in good faith is a general principle of international law.⁶⁷ This implies that negotiations are subject to a notional time-frame in order to prevent States from unnecessary delays.⁶⁸ The ICJ *North Sea Continental Shelf Cases* provided a general standard for States to enter into negotiations under the so-called equitable principles.⁶⁹ Although this standard encourages States to reach an agreement in negotiations, under petroleum development there is still no mandatory rule for States to do so.

3.2.3.2. Failure to Agree and its Implications

The likelihood that States might fail to agree after negotiations is always present in any dispute. When this occurs several implications exist. Cameron implies that “in the event of a failure to agree, they may choose to make further efforts at developing cooperative arrangements, or go ahead independently and develop the resources.”⁷⁰ However under UNCLOS it seems that the only valid option left to negotiating States when no agreement is reached is the “compulsory dispute settlement procedures” under Part XV.⁷¹ Nonetheless, there are scholars who question the validity of unilateral proceeds to exploit if negotiations fail.

⁶⁵ Ong, 'Joint Development of Common Offshore Oil and Gas' (n 13) 798.

⁶⁶ Cameron (n 56) 66.

⁶⁷ *ibid* 567.

⁶⁸ Ong, 'Joint Development of Common Offshore Oil and Gas' (n 13) 784.

⁶⁹ Cameron (n 56) 567.

⁷⁰ *ibid*.

⁷¹ UNCLOS art 83(2) refers Part XV that contains art 281 which reads: “(1) If the States Parties which are parties to a dispute concerning the interpretation or application of this Convention have agreed to seek settlement of the dispute by a peaceful means of their own choice, the procedures provided for in this Part apply only where no settlement has been reached by

Mutual restraint may be conducted in the event of disagreement. It entitles an affected State to refuse via a veto power to agree on exploitation of THRs. This right to mutual restraint has received sufficient academic support. Ong implies that “only unilateral actions not amounting to the irreparable prejudice of other States’ rights would be allowed.”⁷² Further, Article 83 (3) of UNCLOS compels States to make every possible effort to not jeopardize the reaching of an agreement. International practice also refrains States from unilateral action when depriving others of the gains they might fulfil by exercising their sovereign rights to exploitation.⁷³ This is well supported as unilateral activity affecting the rights of other States is prohibited under international law and violates a general customary rule to not cause significant and irreversible harm to other States. Such harm may be “actionable under international law, either as a violation of the territorial sovereignty or integrity of the affected State.”⁷⁴

During the *Aegean Sea Continental Shelf Case*, the ICJ held that exploration activities that did not imply installations, or amount to actual appropriation or other use of the natural resources in question, did not justify an interim protection measure.⁷⁵ Under such restriction, it seems that activities extend only to exploration and not exploitation. The *Aegean Sea* decision⁷⁶ stipulated that in the absence of an international framework, States may not exploit, but only explore, THRs before final agreement is reached. As discussed, however, a recalcitrant State cannot veto unilateral exploration activities by the initiating State, unless such activities are clearly prejudicial to its rights. Further, its “potential veto over unilateral exploitation does not allow a State to forgo its continuing duty to negotiate in good faith toward reaching an equitable resolution of the dispute, whether or not it ultimately involves joint development.”⁷⁷ The right of a costal State to exploit resources that lie across the limits of national jurisdiction and the

recourse to such means and the agreement between the parties does not exclude any further procedure. (2) If the parties have also agreed on a time-limit, paragraph 1 applies only upon the expiration of that time-limit.”

⁷² Ong, ‘Joint Development of Common Offshore Oil and Gas’ (n 13) 798.

⁷³ *ibid* 800.

⁷⁴ *ibid* 799.

⁷⁵ *ibid*.

⁷⁶ *Aegean Sea Continental Shelf Case (Greece v. Turkey)* Judgment (19 December 1978) ICJ Reports 1978.

⁷⁷ Ong, ‘Joint Development of Common Offshore Oil and Gas’ (n 13) 800.

international Area also supports this limited veto.⁷⁸ To Ong there is no reason why the principle of prior consent should not be applied by analogy to a similar factual situation regarding two or more affected States.⁷⁹ This is particularly relevant to areas of overlapping claims, as in the absence of an agreed boundary, States cannot determine with precision where its right to exploitation ends. The duty to cooperate, to negotiate in good faith and the right to mutual restraint must be treated as a single comprehensive concept. Under UNCLOS such cooperative provisions should be analysed as complementary concepts of an overreaching general obligation to cooperate.

However, if States are unable to reach an agreement, four options may be available: "First, the States may go proceed independently to develop the resource with due regard to the principle of mutual restraints. Second, the States may exercise restraints from undertaking any exploratory activity in their common boundary (this may not be an economically wise option). Thirdly, the States may resort to the compulsory dispute settlement mechanism under Part XV of Article 83 (2) of UNCLOS. And the fourth and perhaps the most appealing of the options is that the States may choose to make further efforts at developing other forms of temporary cooperative arrangements."⁸⁰

3.2.3.3. Unilateral Action

Unilateral exploitation normally occurs when a State is convinced that it is in the legitimate and overall economic interest of its people to exploit a straddling resource. It is still unclear whether an uncooperative State that refuses to negotiate has forfeited its ability to hold the other State responsible for the violation of its sovereign rights.⁸¹ Such an uncooperative State may however be compensated for its acquiescence to unilateral exploitation by a neighboring

⁷⁸ "Consultations, including a system of prior notification, shall be maintained with the State concerned, with a view to avoiding infringement of such rights and interests. In cases where activities in the Area may result in the exploitation of resources lying within national jurisdiction, the prior consent of the coastal State concerned shall be required." UNCLOS art 142(2).

⁷⁹ Ong, 'Joint Development of Common Offshore Oil and Gas' (n 13) 784.

⁸⁰ Bitrus (n 55) 14.

⁸¹ M Miyoshi, 'The Basic Concept of Joint Development of Hydrocarbon Resources on the Continental Shelf' (1988) 3 IJECL 1 cited by Ong, 'Joint Development of Common Offshore Oil and Gas' (n 13) 801.

State.⁸² Nonetheless, examples of unilateral action often create unnecessary tensions and armed conflicts.⁸³ However, as best described by Ong only unilateral actions not amounting to an irreparable prejudice of rights are likely to be permitted.⁸⁴ As the migratory nature of hydrocarbons continues to exacerbate complex legal questions, to Ong unilateral action is permissible only in respect to “exploration” and not “exploitation”.⁸⁵ In the *Guyana v. Suriname* maritime boundary dispute case, the Tribunal found that Guyana despite having an obligation to cooperate with Suriname, retained the right to engage in exploratory drilling activities while resolution of the boundary dispute was pending. In broad terms the Tribunal implied that “international courts and tribunals should also be careful not to stifle the parties’ ability to pursue economic development in a disputed area during a boundary dispute.”⁸⁶

What it is clear, however, is that the absence of an international rule of capture proscribes States to unilateral exploitation of a common deposit.⁸⁷ Although there is no international convention or ICJ decision directly addressing the rule of capture, there is sufficient support questioning its existence under

⁸² *ibid.*

⁸³ Australia took a unilateral action in the Ashmore Reef (in the Ashmore and Cartier Islands) an area subject to disputing claims between Australia and Indonesia. Australia unilaterally closed the surrounding waters to traditional fishing and created a natural park in the region while continuing to prospect for hydrocarbons. T Hunter, ‘Sustainable Extraction of Petroleum Resources in Australia and Norway’ (2014) 1 *The Extractive Industries and Society* J 48 <<http://www.sciencedirect.com/science/article/pii/S2214790X14000148>> accessed 8 January 2016; Recently, unilateral action created tensions between Azerbaijan and Russia when Azerbaijan unilaterally signed an agreement with BP to explore resources in the disputed Caspian Sea. The Russian government immediately wrote to the British Embassy in Moscow stating that the ownership of the Caspian resources remained unresolved and hence such an act amounted to unilateral action that may hamper the resolution of the Caspian Sea dispute. Similarly, Iran also a party to the Caspian Sea dispute challenged Azerbaijan’s unilateral action. H Kaj, ‘Ownership of the Oil and Gas Resources in the Caspian Sea: Problems and Solutions - International Arbitration and Contractual Clauses’ (2009) 4 *OGEL* 11; Brunei and Malaysia exercised mutual restraint in the disputed area of Limbang. Both countries had to cease oil and gas exploration in their offshore and deep-water seabeds pending an agreement over the allocation of the disputed areas. In the 2002 Declaration on the Conduct of Parties in the South China Sea, China, Malaysia, Philippines, Taiwan, Vietnam and Brunei exercised mutual restraint over the disputed Spratly Islands. 2002 Declaration on the Conduct of Parties in the South China Sea, Adopted by the Foreign Ministers of ASEAN and the People’s Republic of China (8th ASEAN Summit in Phnom Penh, Cambodia on 4 November 2002) <<http://www.aseansec.org/13163.htm>> accessed 2 February 2016

⁸⁴ Ong, ‘Joint Development of Common Offshore Oil and Gas’ (n 13) 798.

⁸⁵ *ibid* 800.

⁸⁶ *Guyana vs. Suriname Arbitration*, Award of the Tribunal (17 September 2007) PCA Award First Stage, ICGJ 370. Also see, for example, Weems and Fallon (n 3)

<<http://www.kslaw.com/library/newsletters/EnergyNewsletter/2012/May/article2.html>> accessed 2 February 2016

⁸⁷ *ibid.*

international law.⁸⁸ Scholar and practitioner Rodman Bundy supports the application of the rule of capture in an international context. Bundy described a situation in which an oil company was producing oil from an Abu Dhabi offshore field called the Sassan field that straddled a delimited international boundary between Iran and Abu Dhabi. During the Iranian Revolution, a shutdown of production on the Iranian side occurred. Because of the migratory characteristics of oil, Iran's shut-down resulted in a substantial migration of oil to the Abu Dhabi side of the field, where production continued. Abu Dhabi did not curtail production or reimburse Iran. Bundy reasoned Abu Dhabi had no obligation to do so because "the exploitation of international oil and gas reserves is still based largely on the law of capture... This means that, in the absence of an agreement to the contrary, a State or international oil company is free to maximize production from its side of the boundary line notwithstanding the policies of neighboring States which share the same field."⁸⁹ Bundy implied that Iran had no cause of action against Abu Dhabi under international law.⁹⁰ A more recent example is Qatar's straddling North Field, known as South Pars with Iran. Qatar is said to be developing the North Field without an overreaching arrangement with Iran. It is uncertain whether Iran may decide to voice an objection under international law.⁹¹

3.2.3.4. Provisional Arrangements

It seems that under UNCLOS, States are limited to establish provisional agreements for the development of THRs only when legal title is recognized and international law allows them to do so. Becker-Weinberg implies that "the ability for two or more States to enter into a joint development agreement of offshore

⁸⁸ A group of scholars specializing in the international law of the sea and energy at the Third Workshop on Joint Exploration and Development of Offshore Hydrocarbon Resources in Southeast Asia, held in Bangkok from 25 February to 1st March, 1985, agreed that no international rule of capture exists, quoting a handwritten memorandum entitled "Summary Thoughts" by J Van Dyke, chairman of the final session. Also see, for example, T Daintith, *Finders Keepers? – How the Rule of Capture Shaped the World Oil Industry* (RFF Press 2010) Ch 12.

⁸⁹ R Bundy, 'Natural Resources Development (Oil and Gas) and Boundary Disputes', in Blake G et al (eds), *Peaceful Management of Transboundary Resources* (Graham & Trotman 1995) 23, 24.

⁹⁰ *ibid* 25, noted that the delimitation agreement between the affected States provided that neither State would drill within 125 meters of the boundary without the other State's approval. The delimitation agreement also stipulated an obligation to "endeavor to reach agreement as to the manner which the operations on both sides of the boundary could be co-ordinated or unitized." Art 2 of the Agreement Concerning the Boundary Line Dividing Parts of the Continental Shelf Between Iran and the United Arab Emirates states (30 September 1975) LIS No. 63.

⁹¹ ISN Blog, Centre for Security Studies (ETN Zurich) <<http://isnblog.ethz.ch/>> accessed 18 April 2014

hydrocarbon deposits and to implement a cooperative regime in a specific maritime area pending the delimitation of maritime boundaries is strictly related with the legal title upon which these States substantiate their respective claims over the relevant continental shelf. States may only undertake activities in disputed maritime areas that they are legally entitled to. Any regime of internationalization of marine natural resources depends first and foremost on States being entitled to develop such resources.”⁹² As it involves the sovereign rights, if not sovereignty, of the coastal States concerned, the adjustment of overlapping claims to the continental shelf or the EEZ has proved to be very difficult at least in the immediate term. Nevertheless, if the affected States have the political will to momentarily set aside issues of delimitation in favour of development of prospective THRs joint development arrangements have proved to be a pragmatic solution.⁹³ An affected State may be interested in a cooperative approach because: (a) it prevents its neighboring States from unilaterally extracting petroleum from the common petroleum reservoir; and (b) it lowers their extraction costs, maximizes production rates and minimizes environmental and social impact.⁹⁴ JDAs and international unitization go all the way back to the 1950s, besides the increasing number of current framework agreements, to date there are at least more than twenty cases of well-known joint development agreements around the world.⁹⁵ Although it is difficult for international unitization and framework agreements to occur in areas where different States have

⁹² Becker-Weinberg (n 1) 96.

⁹³ To this end the political will on the affected States has become a sine qua non condition for the development of joint development arrangements. The lack of political will has proved to be the major obstacle to the resolution of the Caspian Sea dispute among the littoral states of Russia, Kazakhstan, Iran, Azerbaijan and Turkmenistan. J Calabrese, ‘The Legal Status of the Caspian Sea’ (19 September 2011) MEI <http://www.parstimes.com/law/caspian_status.html> accessed 3 February 2016. However, recent State practice particularly in the South China Sea and the wider Asian Pacific region have evidenced support to the practical benefits of setting aside disputes over maritime delimitation in favour of joint exploitation of shared resources. Examples in the North Sea (Markham Field, 1992) and the Persian Gulf (Yemen, 1998) regions, as well as more recent agreements on the Caribbean (Colombia-Jamaica, 1993), eastern Atlantic (Guinea Bissau- Senegal, 1993/1995), and Southern Atlantic (Argentina- United Kingdom, 1995) regions, attest the increasing preference for mutual beneficial cooperative exploitation rather than resorting to dispute mechanisms.

⁹⁴ J Weaver and D Asmus, ‘Unitizing Oil and Gas Fields Around The World: A Comparative Analysis of National Laws and private Contracts’ (2006) 28 UHLC 3; A Bastida and others, ‘Cross-Border Utilization and Joint Development Agreements: An International Law Perspective’ (2006-2007) 29 Hous J Intl L 355; W Onorato, ‘Apportionment of an International Common Petroleum Deposit’ (1977) 26 Intl & Comp LQ 336.

⁹⁵ For a chronological list of these agreements refer to G Jianjun, ‘Joint Development in the East China Sea: Not an Easier Challenge than Delimitation’ (2008) 23 IJMCL 39, 41-45; Miyoshi (n 81) 41, 42.

overlapping claims, recent practice in JDAs have included broader provisions including mandatory unitization in development zones of contested boundaries.⁹⁶

However, as illustrated in the following sections, questions around whether sufficient petroleum conservation measures are in place remains. In addition to the provisions of the law of the sea, the following sections provide a summary of the general principles of international law that must now guide States in the negotiation and drafting of international arrangements for the development of THRs. As mentioned in the previous Chapters the relationship between petroleum conservation and sustainability is now a days unavoidable. As evidenced across national petroleum laws, sustainability continues to play a fundamental role in petroleum development, a statement that should not to be absent in international frameworks.

3.3. Internationalization of Shared Natural Resources and Its Impact to THRs

The way the world foresees shared natural resources has changed dramatically. Shared natural resources are no longer mere natural boundaries or imaginary fences but tangible opportunities for development and growth. Shared resources have recently become a major focus of international developments; cooperation for the use of shared rivers and common aquifers and the search for THRs have increased dramatically. Demand for such resources along with the breaking-up of

⁹⁶ This seems the case with the Agreement between the Government of Australia and the Government of the Democratic Republic of Timor-Leste relating to the Unitization of the Sunrise and Troubadour fields, executed in Dili on 6 March 2003. The overlapping area between the joint development area and the sunrise and troubadour fields justified the need for unitization as a single field. There are two sets of interests involved: on the one hand, the share interests of both Australia and Tomir-Leste in the joint development area, and on the other Australia's exclusive interest in the sunrise and troubadour fields. J. Bian, 'The Joint Development Zone between Nigeria and Sao Tome and Principe: a case of Provisional Arrangement in the Gulf of Guinea, International Law, State Practice and Prospects for Regional Integration' (2010) UN/DOALOS 3 <http://www.un.org/depts/los/nippon/unff_programme_home/fellows_pages/fellows_papers/tanga_0910_cameroon.p> accessed 3 February 2016

political boundaries⁹⁷ have recently impelled complex legal questions around their accessibility and sustainability.⁹⁸

“Because many, if not most, of these resources defy political borders, governmentally managed scarcity has become during the twentieth century a major international concern.”⁹⁹

As brilliantly demonstrated in Garret Hardin’s classical tale of “the tragedy of the commons,”¹⁰⁰ as natural resources become scarce, anxiety grows to enter into a race-to-the-bottom for a fierce exploitation of such resources. Precisely because what characterizes transboundary natural resources is in principal their partial access by a delimited number of States, nations ultimately face “the starkly ancient choice between conflict and cooperation.”¹⁰¹

It was not until the 1970s that the UN Agenda formerly adopted the issue of conservation and utilization of natural resources shared by two or more States. Due to the extreme differences of opinion, during the seminal 1972 Stockholm Conference it proved to be impossible to include the issue of shared resources in the UN Declaration on the Human Environment.¹⁰² Despite the influence of the Stockholm Conference for an international human right to a clean environment

⁹⁷ “More resources have become transboundary resources as a consequence of the enormous political changes, from the breaking up of empires after World War I, through the decolonization process, to the collapse of the Soviet Union and the dissolution of Yugoslavia.” E Benvenisti, *Sharing Transboundary Resources - International Law and Optimal Resource Use* (CUP 2002) 15.

⁹⁸ A helpful approach for defining shared natural resources is to consider the subtractability and excludable attributes of the resource domain. Shared natural resources are always partially excludable and rival. The benefits from access to these resources are rival, since the “degree to which one appropriator’s use of the resources diminishes the amount of the resource left to others” (subtractability), and partially excludable as only the States that have direct access to the resource domain can benefit from it (exclusion). S Buck, *The Global Commons - An Introduction* (Earthscan Publications Ltd 1998) 3. For the optimal use of shared natural resources refer to Benvenisti, *Sharing Transboundary Resources* (n 97) 15; E Schlager and E Ostrom, ‘Property Rights Regimes and Natural Resources: A Conceptual Analysis’ (1992) 68 (3) *Land Eco* 249, 251.

⁹⁹ Benvenisti, *Sharing Transboundary Resources* (n 97) 15.

¹⁰⁰ G Hardin, ‘The Tragedy of the Commons’ (1968) 162 *Science* 1243, 1244.

¹⁰¹ “Neither Syria nor Iraq can lay claim to Turkey’s rivers any more than Ankara could claim their oil. This is a matter of sovereignty. We have a right to do anything we like. The water resources are Turkey’s, the oil resources are theirs. We don’t say we share their oil resources, and they can’t say they share our water resources.” S Demirel, President of Turkey, 25 July 1992. Quoted in C Mitchell, ‘Thirsting for War’ (29 September 2000) BBC News

<http://news.bbc.co.uk/hi/english/audiovideo/programmes/correspondent/newsid_946000/946916.stm> accessed 4 February 2016; Benvenisti, *Sharing Transboundary Resources* (n 97) 15.

¹⁰² Schrijver (n 50) 30.

“essential to... the enjoyment of basic human rights- even the right to life itself,”¹⁰³ consensus to include the question of shared natural resources by two or more States was not reached. It was not until 1973 during the Fourth Conference of Heads of State or Government of Non-Aligned Countries¹⁰⁴ held in Algiers that consensus to develop “an effective system of cooperation for the conservation and exploitation of the natural resources shared by two or more States”¹⁰⁵ was finally agreed. In that same year, “on behalf of a large number of non-aligned countries, Yugoslavia tabled in the UN General Assembly a draft resolution on Cooperation in the field of the environment concerning natural resources shared by two or more States.”¹⁰⁶ Discussions lead to what a year later became Article 3 and Article 30 of the Charter of Economic Rights and Duties of States. Article 3 of the Charter of Economic Rights and Duties of States implies that “in the exploitation of natural resources shared by two or more countries, each State must cooperate on the basis of a system of information and prior consultation in order to achieve optimum use of such resources without causing damage to the legitimate interests of others.” On 13 December of 1973, with 100 votes to eight, with twenty-eight abstentions UNGA Resolution 3129 (XXVIII) was finally adopted. UNGA Resolution 3129 (XXVIII) mandated the Governing Council of UNEP to initiate the drafting of international standards for the conservation and harmonious exploitation of

¹⁰³ M Shaw, *International Law* (6th edn, CUP 2008) 847. Principle 1 of the UN Declaration on the Human Environment (16 June 1972) UN Doc A/Conf.48/14/Rev. 1 reads as follows:

Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being.

¹⁰⁴ Economic Declaration of the Heads of State or Government of Non-Aligned Countries, 4th Summit Conference of Heads of State or Government of the Non-Aligned Movement (9 September 1973)

<http://cns.miiis.edu/nam/documents/Official_Document/4th_Summit_FD_Algers_Declaration_1973_Whole.pdf> accessed 4 February 2016

¹⁰⁵ Schrijver (n 50) 130.

¹⁰⁶ At the time and without substantive alignment, the debate focused mainly on the formulation of the rights and duties of neighboring states in connection to shared natural resources and their relation to the principle of permanent sovereignty, state responsibility before the international community and the role of international cooperation in the conservation and use of such resources. The principle of permanent sovereignty over natural resources and the extent of international cooperation motivated a great confrontation of opinions, both in the negotiations of the working group and in the General Assembly. Although there was a general consensus that the exploitation of natural resources belonging to two or several states must be based on inter-state cooperation, its relation to the principle of permanent sovereignty over natural resources and consequently its rights and duties for the conservation and exploitation could not be settled. *ibid* 131.

shared resources.¹⁰⁷ UN Resolution 3129 (XXVIII) proved to strengthen the principle of inter-state cooperation and open-a-door to new principles essential for the conservation and optimal exploitation of shared natural resources. UN Resolution 3129 (XXVIII) was the first resolution to properly acknowledge what Benvenisti called the “internationalization” of shared resources.

3.3.1. UNEP Guidelines

As a direct result of UNGA Resolution 3129 (XXVIII), the Executive Director of UNEP in cooperation with other organizations within the UN, international organizations and governments, established an Intergovernmental Working Group of Experts on Natural Resources Shared by Two or More States to draft principles of conduct with respect to the use and conservation of shared natural resources. UNEP under its Decision 6/14 of May 1978, issued a set of guidelines to encourage States to cooperate for the conservation and harmonious utilization of shared natural resources. Based on Principle 21, 22 and 24 of the Stockholm Declaration¹⁰⁸ and Article 30 of the Charter of Economic Rights and Duties of

¹⁰⁷ Cooperation in the Field of Environment Concerning Natural Resources Shared by two or More States, UNGA Res 3129 (XXVIII) (13 December 1973) A/Res/34/186, relevant operative paragraphs established the following guidelines:

“The General Assembly

1. Considers that it is necessary to ensure effective cooperation between countries through the establishment of adequate international standards for the conservation and harmonious exploitation of natural resources common to two or more States in the context of the normal relations existing between them;
2. Considers further that the cooperation between countries sharing such natural resources and interested in their exploitation must be developed on the basis of a system of information and prior consultation with the framework of the normal relations existing between them;
3. Requests the Governing Council of the United Nations Environment Programme, in keeping with its function of promoting international cooperation according to the mandate conferred upon it by the General Assembly, to take duly into account the preceding paragraphs and to report on measures adopted for their implementation...”

¹⁰⁸ Principle 21 reads as follows: “States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.”

Principle 22 reads as follows: “States shall cooperate to develop further the international law regarding liability and compensation for the victims of pollution and other environmental damage caused by activities within the jurisdiction or control of such States to areas beyond their jurisdiction.”

Principle 24 reads as follows: “International matters concerning the protection and improvement of the environment should be handled in a cooperative spirit by all countries, big or small, on an equal footing. Cooperation through multilateral or bilateral arrangements or other appropriate means is essential to effectively control, prevent, reduce and eliminate adverse environmental effects resulting from activities conducted in all spheres, in such a way that due account is taken of the

States, UNEP Guidelines hold fifteen non-binding principles. The recommendations of the Intergovernmental Working Group for the suggested code were based on the following guidelines:

(i) “The code should, while recognizing the sovereign right of States to exploit natural resources within their jurisdiction or control, uphold the responsibility of a State to ensure that the exercise of such sovereign right does not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction. This general principle, as explained above, derives directly from general international law and is reflected in Principle 21 of the Stockholm Declaration, General Assembly resolution 2995 (XXVII), Article 30 of the Charter of Economic Rights and Duties of States and numerous other legal instruments and conventions;

(ii) The code should urge States sharing natural resources to conclude bilateral or multilateral agreements to regulate their conduct, in a legally binding manner, with respect to cooperation in the field of the environment concerning the conservation and the harmonious use and management of shared natural resources. In this respect, the Governing Council may wish to urge States to include *inter alia* in these agreements, the establishment of joint institutional structures, such as joint international commissions, for joint consultations and planning on, and rational management of, the shared natural resource. As indicated in the analysis of the replies of Governments and international organizations, the establishment of such joint commissions or other similar institutions, even in the most informal manner, has proved to be the most effective mechanism for the

sovereignty and interests of all States.” Declaration of the United Nations Conference on the Human Environment UN Doc. A/Conf.48/14/Rev 1(1973) (Stockholm Declaration).

avoidance and settlement of disputes, especially in the case of international water systems.¹⁰⁹

In an analysis of the fifteen principles as originally discussed by the Intergovernmental Working Group, five principles have influenced directly the further codification of THRs. As evidenced in the following Chapters, a duty to cooperate¹¹⁰, to execute agreements and other arrangements¹¹¹, to perform environmental assessments,¹¹² to exchange information and consultations,¹¹³ and

¹⁰⁹ Report of the Intergovernmental Working Group. The Council had before it a note by the Executive Director there on (UNEP/GC/101 and Corr.1) to which was annexed the Report of the Intergovernmental Working Group of Experts on Natural Resources Shared by Two or More States on the work of its third session (UNEP/IG-7/3) 41.

¹¹⁰ Draft principles of conduct for the guidance of states in the conservation and harmonious exploitation of natural resources shared by two or more states, UNEP Decision 6/14 (UNEP Guidelines) Principle 1 - Duty to Cooperate

"It is necessary for States to cooperate in the field of the environment concerning the conservation and harmonious utilization of natural resources shared by two or more States. Accordingly, it is necessary that consistent with the concept of equitable utilization of shared natural resources, States cooperate with a view to controlling, preventing, reducing or eliminating adverse environmental effects which may result from the utilization of such resources. Such cooperation is to take place on an equal footing and taking into account the sovereignty, rights and interests of the States concerned."; Adede A, 'United Nations Efforts Toward The Development of an Environmental Code of Conduct for States Concerning Harmonious Utilization of Shared Natural Resources' (1978 – 1979) 43 *Alta L Rev* 488, 497.

The expression equitable utilization was taken from the 1966 Helsinki Rules on the Uses of the Waters of International Rivers. The term equitable utilization under art 4 of the Helsinki Rules refers to "the equal rights in kind and correlative with those of each States." In addition, the terms "collective management" and "optimal and sustainable utilization" are all key elements when defining equitable utilization. Benvenisti, *Sharing Transboundary Resources* (n 97) 15.

¹¹¹ UNEP Guidelines "Principle 2- Agreements and other arrangements

In order to ensure effective international cooperation in the field of the environment concerning the conservation and harmonious utilization of natural resources shared by two or more States, States sharing such natural resources should endeavor to conclude bilateral or multilateral agreements between or among themselves in order to secure specific regulation of their conduct in this respect, applying as necessary the present principles in a legally binding manner, or should endeavor to enter into other arrangements, as appropriate, for this purpose. In entering into such agreements or arrangements, States should consider the establishment of institutional structures, such as joint international commissions, for consultations on environmental problems relating to the protection and use of shared natural resources."

The recommendation to establish institutional organizations such as joint commissions was strongly supported and viewed as an efficient approach to manage shared resources. The recommendation to incorporate joint commissions for the management of shared resources was taken from the arisen disputes on international rivers. D Caponera, 'Patterns of cooperation in international water law: Principles and institutions' (1985) *NRJ* 25, 563.

¹¹² *ibid* "Principle 4- Environmental Assessments

States should make environmental assessments before engaging in any activity with respect to a shared natural resource which may create a risk of significantly affecting the environment of another State or States sharing that resource." Report of the Intergovernmental Working Group 41.

¹¹³ *ibid* "Principle 5- Exchange of Information and Consultations

States sharing a natural resource should, to the extent practicable, exchange information and engage in consultations on a regular basis on its environmental aspects."

to protect the development potential of States,¹¹⁴ have been widely developed in numerous international instruments. The drafting of the UNEP Guidelines was a major accomplishment. The UNEP Guidelines provided great intrinsic value and help shaped the codification work of international and municipal laws on the field of shared natural resources.¹¹⁵ Although the UNEP Guidelines are not mandatory and only provide recommendations, there is no reason to ignore its great value and applicability for THRs.

3.4. Balancing Rights and Duties of States for the Development of THRs

It is a well-established practice, accepted as law, that within the limits of international law every State is free to manage and utilize the natural resources within its jurisdiction and to formulate and pursue its own environmental and developmental policies.¹¹⁶ However, on the other hand it is also a well-established practice that States have to: (a) utilize their natural wealth and resources for the well-being of their peoples, as stipulated in paragraph 1 of the 1962 Declaration on Permanent Sovereignty and Article 1 of the Human Rights Covenants; and (b) take

Unfortunately, the recommendation from a number of States to include additional information such as technical studies on uses, economic and social reports was rejected. Adede (n 110) 498.

¹¹⁴ UNEP Guidelines "Principle 15- Development Potential

The present principles should be interpreted and applied in such a way as to enhance and not to affect adversely development and the interests of all countries, and in particular of the developing countries." Report of the Intergovernmental Working Group 44. This is of particular importance as coupled with the principles of good faith and in the spirit of good neighborliness a duty to protect the developmental potentials of all States, particularly those of the developing countries for the development of THRs, was much needed. For example, to the Caribbean Sea States access to THRs is their only source of hydrocarbons.

¹¹⁵ The principles described in the UNEP Guidelines evolved in other relevant UN codification work such as the 1979 Convention on the Conservation of Migratory Species of Wild Animals (adopted 23 June 1979, entered into force 1 November 1983) 1651 UNTS 333, the 1982 Protocol on the Conservation of Common Natural Resources (adopted 24th July 1982) IEL 982:10, UNCLOS, the 1989 Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (adopted 22 March 1989, entered into force 5 May 1992) 1673 UNTS 79, the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (adopted 7th March 1992, entered into force 6 October 1996) 1926 UNTS 269, the 1993 Convention on Biological Diversity (adopted 5th May 1992, entered into force 29 December 1993) 170 UNTS 79 (CBD), the 1994 Convention on Climate Change (adopted 9 May 1992, entered into force 21 March 1994) 1771 UNTS 107 (Climate Change Convention) and the 2010 UN Draft Law of Transboundary Aquifers Draft Articles on the Law of Transboundary Aquifers, ILC 60th session (2008) Official Records of the General Assembly, 63rd session, Supplement No. 10 (A/63/10).

¹¹⁶ Principle 21 of the Stockholm Declaration; Principle 2 of the Declaration on Environment and Development UN Doc A/Conf.151/5/Rev.1 (1992) (Rio Declaration); CBD art 3.

into account the interests of other States as well as those of present and future generations of humankind.¹¹⁷ Yet, what does this mean for the development of THRs? Although the relationship between petroleum conservation and sustainable development is unquestionable, how do principles of sustainable development enhance petroleum conservation? Based on the three basic pillars of sustainable development: -environmental protection, economic stability and social sustainability; a summary of the relevant principles and its relation to petroleum conservation is provided. Although not every principle has the same scope or status in international law. Some are well established, while others are still emerging. Some entail first and foremost prohibitions for States to act in a certain way, while others primarily relate to obligations with respect to neighbours. All of them are equally vital for our work. The summary of the principles is limited to highlight its potential impact to petroleum conservation and therefore, it is not intended to be a thorough study of the principles *per se*. Likewise, the outline and headings of the principles below do not follow a specific order nor are intended to provide an exhaustive list of the applicable principles.

3.4.1. Environmental Protection

3.4.1.1. Due care for the environment and precautionary action

The principles of ‘due diligence’ or ‘due care’ with respect to the environment and natural wealth and resources are among the core principles of international environmental law. Apart from constant monitoring, an assessment of the environmental impact is often foreseen. There is an increasing emphasis on the duty of States to take preventive measures to protect the environment. The emergence of this ‘precautionary’ principle is reflected in numerous treaty law.¹¹⁸ The ‘precautionary approach’ is also incorporated in Principles 15 and 19 of the

¹¹⁷ Art 30 of Charter on Economic Rights and Duties of States UNGA Res 3281 (xxix) (12 December 1974) UN Doc A/Res/29/3281 (CERDS); Stockholm Declaration; Rio Declaration.

¹¹⁸ General Agreement on Trade and Tariffs (Adopted 15 April 1994, entered into force 1 January 1995) 1867 UNTS 187 (GATT) art XX(b) and (g); UNCLOS arts 192, 204 and 206; Convention for the Protection of the Ozone Layer 22 March 1985, entered into force 22 September 1988) 1513 UNTS 323 Preamble; Montreal Protocol on Substances that Deplete the Ozone Layer (adopted 1987-09-16, entered into force 1 January 1989) 1522 UNTS 3 Preamble; Climate Change Convention art 3(3); CBD art 6; United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (adopted 17 June 1994, entered into force 26 December 1996) 1954 UNTS 3 art 4; Energy Charter Treaty (adopted 17 December 1994, entered into force 16 April 1998) 2080 UNTS 95 art 19(1).

Rio Declaration. Due diligence has been conveyed by the ICJ in the *Corfu Channel Case* and accepted as a normative standard on States for compliance with Principle 21 of the Stockholm Declaration, recognized as customary law, which imposes “the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction”.¹¹⁹

The precautionary approach can be defined as unilateral or negotiated preventive actions that States agree to execute in order to ensure the preservation of a natural resource or to allow its regeneration over a period of time. However, according to French this approach “has proved to be an especially controversial aspect of international environmental law. Different courts and tribunals have struggled to give it substantive effect and to determine its legal status.”¹²⁰ What the precautionary approach exactly entails and what its consequences are have not yet crystallized as it continues to touch deeply on the discretion of States with regard to policy. Three factors have been accepted as general guidelines. First, the general state of knowledge will be constantly improving because of new information being brought forward. Secondly, the level of due diligence will depend on the type of the risks and activities to be undertaken. The higher the risk the detailed the level of due diligence. For example, the activity of prospecting is less risky than exploration and that is less risky than exploitation. Finally, the risk will also vary upon the geological characteristics of the resource that is being exploited.¹²¹ Although not all instances of transboundary damage resulting from activities within a State’s territory can be prevented or are unlawful. There is sufficient support to require an EIA before any activity; either for prospecting or if exploitation is conducted. This clearly follows the *Trail Smelter* and the *Lac Lanoux* awards.¹²²

The Seabed Disputes Chamber considered that carrying out an environmental impact assessment was a ‘direct obligation’ under UNCLOS and a

¹¹⁹ *Corfu Channel case (United Kingdom v Albania)* Judgment (9th April 1949) Merits, ICJ GL No 1 (1949) ICJ Rep 4, ICGJ 199. Also see, for example, D French, ‘From the Depths: Rich Pickings of Principles of Sustainable Development and General International Law on the Ocean Floor-the Seabed Disputes Chamber’s 2011 Advisory Opinion’ (2011) 26 IJMCL 525, 542.

¹²⁰ *ibid* 549.

¹²¹ *ibid* 543.

¹²² *Trail Smelter Case (US v. Canada)*, Arbitral Tribunal (1941) 3 UN Rep Intl Arb Awards 1905; *Lake Lanoux Arbitration (France v. Spain)* Arbitral Tribunal (1957) 12 UN Rep Intl Arb Awards 281.

general obligation under customary international law and, consequently, “should be included in the system of consultations and prior notifications set out in Article 142.”¹²³ Further, the incorporation of environmental obligations related to monitoring and reporting ensures that environmental protection extends beyond the pre-approval stage of exploration to during and after such activities. These would embrace, that all activities would be subject to regular inspections, including offshore installations; that activities must be carried out in accordance with a formal written development plan, with direct control over the selected operator and to apply penalties to contractors.¹²⁴ To conclude, as discussed in the previous Chapters, the application of petroleum conservation principles over transboundary resources has also become a requirement for environmental protection. The increasingly role played by environmental considerations in natural resources development has been fully supported by the significance of Principle 4 of the Rio Declaration, whereby the integration of environmental considerations within development projects is mandatory.

3.4.1.2. Prior Information, Early Warning and Public Participation

Whenever transboundary resources are at stake or activities within the territory of one State may seriously affect the environment of other States, or persons or property therein, States are under an obligation to well in advance inform and consult such matters with other States. In the event of a transboundary environmental disaster (such as an oil spill or toxic discharge) or even less acute environmental problems, States are under an obligation to caution other States and to cooperate to contain and solve such matters.¹²⁵

States are also under a duty to involve all concerned citizens in the development process and debate about environmental matters, including resource

¹²³ Becker-Wienberg (n 1) 195.

¹²⁴ By analogy with exploitation of resources in the international Area see UNCLOS art 162 (2)(j), art 165 (2)(b); Also see, for example, Chapter 5 How Do Framework Agreements Incorporate Petroleum Conservation Principles of Environmental Assessment and Protection?

¹²⁵ UN Convention on the Transboundary Effects of Industrial Accidents (adopted 17 March 1992, entered into force 19 April 2000) 2105 UNTS 457; the Nordic Convention on the Protection of the Environment (adopted 19 February 1974, entered into force 5 May 1976) UNE EPL, Vol 1, 1975-1976 p 44; ILC work on International Liability for Injurious Consequences Arising out of Acts not Prohibited by International Law, UN Doc NCN.4/SER.NI978/Add.I; Principle 19 of the Rio Declaration.

use and management.¹²⁶ Public participation also relates to measures of “timely access to all relevant information (as an essential precondition for participation) and the possibility of appeal procedures.”¹²⁷ The principle of public participation is widely included in the Aarhus Convention; which deals with access to information, public participation in decision-making process and access to justice in environmental matters¹²⁸, also in the Anti-Desertification Convention¹²⁹ and in the ACP-EU Lomé/Cotonou Conventions.¹³⁰

3.4.1.3. Termination of Unlawful Activities and Making of Reparation

Reparation should be designed to restore previous conditions (*restitutio in integrum*) or, if this is not possible, to compensate, financially or in *natura*, for damage and injury inflicted. In environmental studies, the second aspect of this principle is also referred to as ‘the PPP’ or as ‘the principle of compensation for the victims of environmental damage’.¹³¹ The PPP is of a much wider scope since it also includes concepts such as internalization of environmental costs in goods and services and the passing of by State of the reparation costs to polluters, such as private parties, rather than upon the State at large.¹³² The PPP relates particularly to the relationship between the public authorities of a State and polluters within

¹²⁶ Principle 10 of the Rio Declaration:

“Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.”

¹²⁷ Schrijver (n 50) 198.

¹²⁸ Convention on Access to Information, Public Participation in Decision – Making and Access to Justice in Environmental Matters (adopted 25 June 1998, entered into force 30 October 2001) 161 UNTS 447 (Aarhus Convention).

¹²⁹ Art 3 of the Convention obliges the parties “to ensure that decisions on the design and implementation of programmes to combat desertification and/or mitigate the effects of drought are taken with the participation of populations and local communities.”

¹³⁰ Art 2 of the Cotonou Agreement states that the ACP-EU partnership “shall be open to different kinds of other actors in order to encourage the integration of all sectors of society, including the private sector and civil society organizations, into the mainstream of political, economic and social life.” Partnership Agreement Between the Members of the African, Caribbean and Pacific Group of States of the One Part, and the European Community and Its Member States, of the Other Part (adopted 23 June 2000, entered into force 1st April 2003) ACP/CE/en 123 (Cotonou Agreement).

¹³¹ Rio Declaration Principles 16 and 13.

¹³² Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment (adopted 21 June 1993) CETS No. 150.

that State. The PPP principle is a strong incentive to prevent environmental damages from happening at all. Under Principle 16 of the Rio Declaration, the polluter pays principle performs dual functions: the prevention of pollution, and the remediation if pollution were to occur. As a general rule, polluters should bear the full cost of prevention and clean-ups. The authorities of a specific State may help cover those costs but only as a means of last resort. During clean-up operations, the authorities must be satisfied that natural resources have been restored to the state that they were in before damage occurred. However, following the 2010 BP oil spill in the Gulf of Mexico, it is still unclear how environmental damages are calculated globally and to what extent restitution exceeds the original environmental due diligence.¹³³

More recently, and as part of the broader principles to guide sustainable development under the 1992 Rio Declaration, the polluter pays principle has also been applied more specifically to emissions of greenhouse gases which cause climate change. The recent implementation of the 'polluter pays' principle through a so-called carbon price, which imposes a charge on the emission of greenhouse gases equivalent to the corresponding potential cost caused through future climate change has also been an appropriate incentive to reduce emissions. However, it is still under discussions the pollution threshold not be exceeded. Most of the time, such pollution threshold ends up being the realm of uncertainty, where another principle may prevail, the precautionary principle. As discussed below, the role of good governance within Framework Agreements to ensure oversight and accountability of sustainable development principles is notwithstanding necessary. To ensure that future environmental damage is prevented or remedied and that those who cause it are held responsible, is without doubt a key objective of petroleum conservation.

3.4.1.4. Duty to Cooperate in Solving Transboundary Environmental Problems

¹³³ See, for example, Incident Investigation Report Volume 2 "Explosion and Fire at the Macondo Well", US Chemical Safety and Hazard Investigation Board 2014 (6 May 2014) Report No. 2010-10-I-OS; Investigation Report Volume 1 "Explosion and Fire at the Macondo Well", US Chemical Safety And Hazard Investigation Board 2014 (6 May 2014) Report No. 2010-10-I-OS.

The duty of States to cooperate is well established, as exemplified by Chapter IX of the UN Charter and the 1970 Declaration on Principles of International Law. At the bilateral, regional and global level, international cooperation to solve transboundary environmental problems requires prior information, consultation and negotiation. Further, there is also the duty of industrialized countries to contribute to developing countries' efforts to pursue sustainable development. Assistance may entail financial aid, transfer of environmentally sound technology and cooperation through international organizations. UNEP's Regional Seas Programme and the establishment of the Global Environment Facility, a joint project of the World Bank, UNEP and UNDP, can be seen as a tangible example in carrying out this obligation. Transfer-of-technology provisions are notably included in the Montreal Protocol to the Ozone Layer Convention, the Climate Change Convention and the CBD.

3.4.2. Economic Stability

3.4.2.1. Inter- and intergenerational Equity

According to Weiss, States must take into account the interests of both present and future generations. States are under an international obligation to manage their natural resources in such a way as to safeguard its capacity for sustainable use by future generations.¹³⁴ The principle of intergenerational equity is widely reflected under international law. Early treaties, including the 1946 Whaling Convention and the World Heritage Convention, refer to safeguarding the resources for future generations. Principle 1 of the 1972 Stockholm Declaration notes a 'solemn responsibility to protect and improve the environment for present and future generations'. The principle of intergenerational equity has been widely referred in international and domestic courts. In the *Nuclear Tests case (New Zealand v. France)*, Judge Weeramantry noted that the principle of intergenerational equity is "an important and rapidly developing principle of contemporary environmental law... which must inevitably be a concern of this Court".¹³⁵ A practical implementation of the principle was included in a landmark decision by the

¹³⁴ E Weiss, *In Fairness to Future Generations: International Law, Common Patrimony and Intergenerational Equity* (Transnational Publishers United Nations University 1989) 97.

¹³⁵ *Nuclear Tests case (New Zealand v. France)* (1995) Dissenting opinion of Judge Weeramantry in ICJ Reports 1995, 341.

Philippine Supreme Court in 1993. The court ruled that petitioners had legal standing to sue on behalf of the succeeding generations based on “the concept of inter-generational responsibility insofar as the right to a balanced and healthful ecology is concerned... as every generation has a responsibility to the next.”¹³⁶

Sustainable development is frequently defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.¹³⁷ From this definition, two key concepts stand out: needs and limitations imposed to the ability of States to meet both current and future needs; and three values are balance: environmental, social and economic.¹³⁸ Because it is a principle that limits State’s current use of natural resources, it is often suggested that it limits sovereignty on natural resource management.¹³⁹

Conservation and sustainable use of natural resources is a term that was used in The 1982 World Charter for Nature¹⁴⁰, which required resources to be managed to achieve “optimum sustainable productivity” without endangering other ecosystems or species. The term was also included in the Rio Declaration, whereby Principle 8 implies the need to “reduce and eliminate unsustainable patterns of production and consumption”. The idea that sustainable development involves limits on the utilization of land, water and other natural resources can be observed in the CBD and Climate Change Convention and the terms ‘sustainable utilization’ or ‘sustainable use’ are expressly employed in Rio and post-Rio agreements.

A fresh approach to sustainable development is widely provided under the seven principles contained in the ILA’s 2002 New Delhi Declaration of Principles of International Law. To French “this is arguably the most prominent text on the legal implications of sustainable development, despite its non-governmental nature.”¹⁴¹ The principles include: (1) the duty of States to ensure sustainable use of natural resources, (2) equity and the eradication of poverty, (3) common but differentiated responsibilities, (4) the precautionary approach, (5) participation,

¹³⁶ Schrijver (n 50) 242, 243.

¹³⁷ Brundtland Commission 93.

¹³⁸ E Merino Blanco and J Razzaque, *Globalisation and Natural Resources Law - Challenges, Key Issues and Perspectives* (Edward Elgar Publishing Inc 2011) 94.

¹³⁹ *ibid* 95.

¹⁴⁰ World Charter for Nature, UNGA Res A/RES/37/7 (28 October 1982) UN Doc A/Res/37/7 cited by Birnie, Boyle and Redgwell (n 23) 199.

¹⁴¹ French (n 119) 536.

(6) good governance, and (7) integration and interrelationship. The duty of States to ensure sustainable use of natural resources “as framed by the ILA, is a broad notion, reflecting a number of inter-connected obligations in international law, some of which are settled (namely, Principle 21 of the 1972 Stockholm Declaration on the Human Environment).”¹⁴²

Reasonableness is essentially a basis for resolving competing claims where otherwise lawful activities conflict. For Merino Blanco it implies “the notion that states must use common resources reasonably and act in a way that does not interfere with the enjoyment of equal rights of access by other states”.¹⁴³ It is only the repetitive or excessive legal behavior what can harm the interests of the international community. Thus, this constitutes a *sui generis* concept that is merely center on a general duty of States to comply with a moderate way to exploit resources. Based on the traditional concept of “Common Heritage of Mankind”, States must ensure that the conservation and sustainable use of transboundary resources are develop efficiently and preserve for future generations. This seems to be the core of the reasonable use principle as limits States so they do not deplete resources in order to satisfy an immediate need.

3.4.2.2. Equitable Utilization and Apportionment

This is perhaps the most important principle concerning the use and exploitation of shared natural resources. This principle relates to the previous one and implies, firstly, that States should utilize resources and the environment in such a way that other States can utilize them as well or at least obtain a reasonable and equitable share.¹⁴⁴ From this it follows, secondly, that States must coordinate and cooperate for the “optimum use” (in international fisheries law also referred to as “maximum sustainable yield”) of resources and prevent appreciable transboundary damage. This principle is applicable to all forms of shared resources, including water resources, fisheries, and oil and gas deposits.¹⁴⁵ Equitable utilization is the main

¹⁴² *ibid* 537.

¹⁴³ Merino Blanco and Razzaque (n 138) 99.

¹⁴⁴ Brundtland Commission Principle 9.

¹⁴⁵ UNCLOS art 83(1); also see, for example, the ICJ in *Continental Shelf case (Tunisia/Libya Arab Jamahiriya)* Judgement (24 February 1982) ICJ Reports 1982, 3; *Continental Shelf case (Libya Arab Jamahiriya/Malta)* Judgment (14 April 1981) ICJ Reports 1981, 13.

rule of customary law governing the use and allocation of international water resources. To Birnie “the equitable utilization of shared or common property natural resources entails a balancing of interest and consideration of all relevant factors.”¹⁴⁶ What these factors are, and how they balance depends on the context of each case.¹⁴⁷

Evidently, many of these matters result in *ad hoc* situations in which States have to negotiate what are the entitlements to each party. Equity not always results in the same or identical amount of resources a State can exploit but to the previously negotiated prerogatives that can often be unbalanced and could result in an abuse of rights.¹⁴⁸ Abuse of rights under the law of the sea refers to the exercise of rights in bad faith, maliciously or arbitrarily.¹⁴⁹ Birnie sustains that “an alternative view treats abuse of rights as simply another way of formulating a doctrine of reasonableness or a balancing of interests.”¹⁵⁰ To Lauterpatch abuse of rights can be defined as a failure to comply with existing regulations or bending them thanks to legal gaps that are not addressed explicitly under international law.¹⁵¹

¹⁴⁶ P Birnie, 'Protection of the Marine Environment in joint Development' in Fox H (ed), *Joint Development of Offshore Oil and Gas* (1990) 1 BIICL 202, 223.

¹⁴⁷ According to art 6 of the Watercourses Convention, the factors that determine the equitable and reasonable utilization are:

“(a) Geographic, hydrographic, hydrological, climatic, ecological and other factors of a natural character; (b) The social and economic needs of the watercourse States concerned; (c) The population dependent on the watercourse in each watercourse State; (d) The effects of the use or uses of the watercourses in one watercourse State on other watercourse States; (e) Existing and potential uses of the watercourse; (f) Conservation, protection, development and economy of use of the water resources of the watercourse and the costs of measures taken to that effect; (g) The availability of alternatives, of comparable value, to a particular planned or existing use.” Convention on the Law of the Non-navigational Uses of International Watercourses (adopted 21 May 1997, entered into force 17 August 2014) 875 UNTS 11 (Watercourses Convention).

¹⁴⁸ L Goldie, 'Equity and International Management of Transboundary Resources' (1985) 25 NRJ 665.

¹⁴⁹ B Cheng, *General Principles of Law – As applied by International Courts and Tribunals* (Grotius Publications 1987) 121-36; M Byers, 'Abuse of rights: An Old Principle, A New Age' (2002) 47 McGill LJ 389, 389 cited by Birnie (n 146) 204. Also see, for example art 300 of UNCLOS: “States Parties shall fulfil in good faith the obligations assumed under this Convention and shall exercise the rights, jurisdiction and freedoms recognized in this Convention in a manner which would not constitute an abuse of right.”

¹⁵⁰ Birnie (n 146) 204.

¹⁵¹ H Lauterpatch, *The Function of Law in the International Community* (OUP 1933) XXVI 295-300.

3.4.3. Social Sustainability

3.4.3.1. Common but Differentiated Obligations

As in other fields of international law, such as international trade and monetary law, international environmental obligations may differentiate between industrialized and developing States. In general, it means that different standards, delayed compliance or less stringent commitments may be appropriate for different groups of States. It is recognized that social and economic development and poverty eradication are the first priorities of developing States. Principle 7 of the Rio Declaration endorses the common but differentiated responsibilities.¹⁵² What often accounts for in a specific situation is the level of scientific knowledge and technical capabilities available to a given State. French makes a relevant remark by affirming that “many consider the principle to be inherently political in nature and thus beyond the purview of judicial decision-making. As a 'soft law' principle, subject to variable political claims, it has so far proved difficult to strengthen the normative quality of the principle. Nevertheless, even where it has been found advisable for reasons of environmental protection not to support increased differentiation in terms of commitments; it is arguable that judicial bodies should not do so.”¹⁵³ Overall, this principle acknowledges the broader reality of socio-economic differences between States.

3.4.3.2. Good Governance and Respect for Human Rights

There is an expectation of what States are required to accomplish domestically to meet international obligations.¹⁵⁴ For the development of THRs actual arrangements between private operators and sponsoring States must comply with

¹⁵² Rio Declaration Principle 7: "States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit to sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command" French (n 119) 556.

¹⁵³ *ibid* 562.

¹⁵⁴ New Delhi Declaration of Principles of International Law Relating to Sustainable Development, ILA (9 August 2002) UN Doc. A/CONF.199/8, (ILA New Delhi Declaration) paragraph 6.1: "The principle of good governance is essential to the progressive development and codification of international law relating to sustainable development. It commits States and international organizations: (a) to adopt democratic and transparent decision-making procedures and financial accountability...; (c) to respect the principle of due process in their procedures and to observe the rule of law." French (n 119) 562.

sound governance principles. This implies accountability and public availability to ensure transparency of activities. The arrangements in themselves must contain certain measures that would enable sponsoring States to discharge responsibilities under the rule of law. It also refers to examples of good practice¹⁵⁵, emphasizing how domestic law requires standards higher than those imposed by international law.¹⁵⁶ Chowdhury perceives good governance “as a normative principle of administrative law, which obliges the State to perform its function in a manner that promotes the values of efficiency, non-corruptibility, and responsiveness to civil society.”¹⁵⁷ However, as the phenomenon of fragmentation of international law continues, governance plays a fundamental role.¹⁵⁸ Governance is a “share and gain” strategy. Although to some scholars governance will never produce a “perfect institutionalization” continuous strive to reach that goal is a moral and legal requirement. For the development of THRs there are no tradeoffs. Subject to basic human rights norms that require compliance with procedural and due process obligations, governance “has a public trusteeship role, which means they owe and account and must give voice to all who are affected by their acts and omissions.”¹⁵⁹ An obligation to render accountability to the citizens of the affected States and to the citizens of other States is morally and legally required.

Additionally good governance is now widely viewed as an essential element of sustainability and respect for human rights.¹⁶⁰ Two concepts which

¹⁵⁵ *ibid* 562.

¹⁵⁶ An Advisory Opinion provides general guidelines to help sponsoring States meet the principle of good governance in stating, “...the sponsoring State must take into account, objectively, the relevant options in a manner that is reasonable, relevant and conducive to the benefit of mankind as a whole. It must act in good faith, especially when its action is likely to affect prejudicially the interests of mankind as a whole. Reasonableness and non-arbitrariness must remain the hallmarks of any action taken by the sponsoring State.” Advisory Opinion, paragraph 230 cited in *ibid* 565.

¹⁵⁷ N Chowdhury and C Skarstedt, ‘The Principle of Good Governance’ (2005) Draft Working Paper, CISDL Recent Developments in Intl L Related to Sust Develop Series 4.

¹⁵⁸ M Koskenniemi ‘What Use for Sovereignty Today?’ (2011) 1 *Asian JIL* 61, 70; M Koskenniemi, ‘The Fate of Public International Law: Between Technique and Politics’ (2007) 70 *MLR* 1.

¹⁵⁹ Accountability should not be view under private liberty, but rather by its public trusteeship role. E Benvenisti, *The Law of Global Governance* (HAIL, Brill Nijhoff 2014) 143.

¹⁶⁰ An accurate description of good governance is found in the Cotonou Agreement:

“good governance is the transparent and accountable management of human, natural, economic and financial resources for the purposes of equitable and sustainable development. It entails clear decision-making procedures at the level of public authorities, transparent and accountable institutions, the primacy of law in the management and distribution of resources and capacity building for elaboration and implementing measures aiming in particular at preventing and combating corruption.” Art 9. Schrijver (n 50) 202.

currently are inherently interdependent.¹⁶¹ Reference to proper procedures and respect for human rights is emphasized under the definition of good governance provided by the ILA New Delhi Declaration.¹⁶² Human beings depend on the environment in which we live.¹⁶³ A safe, clean, healthy and sustainable environment is essential for a wide range of human rights. Environmental concerns have moved “from the periphery to the centre of human efforts to pursue economic and social development.”¹⁶⁴ Regional human rights tribunals have provided jurisprudence of this relationship.¹⁶⁵ Further, procedural obligations are often protected by human rights instruments, which undoubtedly include the exercise of rights for environmental ends.”¹⁶⁶ The Human Rights Council in its recent Resolution of 24 March 2014 recognises that

“climate change, unsustainable management and use of natural resources and the unsound management of chemicals and wastes represent threats to the enjoyment of a safe, clean and sustainable environment, and that environmental damage has negative

¹⁶¹ As stated by UNGA Resolution A/HRC/22/43 “the recognition of this relationship has principally taken two forms:

(a) adoption of an explicit new right to an environment characterized in terms of healthy, safe, satisfactory or sustainable; and (b) heightened attention to the relationship to the environment of already existing rights, such as rights to health.” *ibid* 205.

¹⁶² *ibid* 203.

¹⁶³ Special Rapporteur on Human Rights and the Environment (former Independent Expert on Human Rights and the Environment) <<http://www.ohchr.org/EN/Issues/Environment/SREnvironment/Pages/SREnvironmentIndex.aspx>>

¹⁶⁴ UNGA Res A/HRC/22/43 (24 December 2012) Report of the Independent Expert on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment at <http://www.ohchr.org/Documents/HRBodies/HRCouncil/RegularSession/Session22/A-HRC-22-43_en.pdf>.

¹⁶⁵ See, for example, ECOSOC General comment No. 14 para 15; *Social and Economic Rights Action Centre v. Nigeria*, communication No. 155/96, decision para 67 African Commission on Human and Peoples Rights; *Saramaka People v. Suriname* (Judgement of 28 November 2007) Series C No. 172, IACHR paras 95, 158.

¹⁶⁶ UNGA Res A/HRC/25/L.31 recognizes “human rights law sets out certain substantive and procedural obligations on states in relation to the enjoyment to a health, clean and safe environment” and “urges states to comply with their human rights obligations when developing and implementing their environmental policies.” Human Rights and the Environment, UNGA Res A/HRC/25/L.31 p3; Also see, for example, Rio Declaration, principles 20 – 23; Declaration on the Rights of Indigenous Peoples, UNGA Res A/61/L.67 (13 September 2007) UN Doc A/61/L.67 arts 18,19,29,32; Report of the Office of the United Nations High Commissioner for Human Rights on the relationship between climate change and human Rights, UN Doc A/HRC/10/610HCHR relating to climate change and its effects on vulnerable groups including indigenous people or children, paras 42-54.

implications, both direct and indirect for the effective enjoyment of human rights...".¹⁶⁷

In the petroleum sector all of the abovementioned activities require good governance for its scrutiny and oversight, which ultimately prevent adversely affects to a wide range of human rights. Sustainability, including due care to the climate and environment, and a respect for human rights, including public participation, are more and more embedded in petroleum municipal laws.¹⁶⁸ The formulation of international frameworks for the development of THRs should govern sustainability measures and human rights. Sustainable development and human rights must not be left out of the overall international discussion on the exploration and exploitation of petroleum resources. Petroleum conservation measures must also include principles of good governance and the fulfilment of human rights.

3.5. Attempts to Propose Rules on THRs and to Standardize State Practice

3.5.1. The work of the ILC on THRs

During its 54th session in 2002, the ILC included the topic of 'Shared Natural Resources' in its long-term work program.¹⁶⁹ In 2007, with the topic of ground waters almost completed, the Special Rapporteur to the Fourth Report of the Commission raised the similarities between groundwater and oil and natural gas deposits. Special Rapporteur addressed the relation between oil and gas deposits and aquifers, from a scientific and technical perspective, and in light of political, economic and environmental aspects. Although Member States welcomed the

¹⁶⁷ Resolution 25/L.31 also "stresses the particular relevance of cooperation in addressing the threats to the enjoyment of human rights that result from transboundary environmental harm" UNGA Res A/HRC/25/L.31 (24 March 2014) 2.

¹⁶⁸ Refer to Chapter 2 section 2.4. Recent Trends in Petroleum Conservation Laws and Regulations.

¹⁶⁹ Special Rapporteur indicated his intention to deal with confined transboundary groundwater, and oil and gas and proposed a step-by-step approach beginning with groundwater. Shared natural resources: feasibility of future work on oil and gas, ILC 62nd Session (2010) Paper prepared by Shinya Murase, ILC Doc A/CN.4/621.

report, it was finally decided to treat transboundary groundwater and oil and gas separately.¹⁷⁰

Accordingly, at its 59th Session the Commission admitted the proposal made by Special Rapporteur Mr. Yamada to establish a working group on the topic of shared oil and gas and, *inter alia*, to prepare a thorough questionnaire to be circulated among States. The questionnaire was to include five seminal questions about State practice and municipal legislation regarding transboundary oil and gas deposits. The questionnaire would seek to determine whether “there were any agreements, arrangements or practices regarding the exploration and exploitation of transboundary oil and gas resources or for any other cooperation for such oil and gas, including, as appropriate, maritime boundary delimitation agreements, as well as unitization and JDAs or other arrangements; the content of such agreements or arrangements or a description of the practice, as well as any further comments or information, including legislation, judicial decisions, which Governments may consider to be relevant or useful to the Commission.”¹⁷¹ Initially, the study of transboundary oil and gas was strongly supported by a number of States. It was noted to be a current economic and industrial necessity, and given that “although oil and gas might not be vital to human life as groundwater, such resources were of strategic importance to States, and the search for energy resources was one of the pressing issues of contemporary times.”¹⁷² The creation of a universal framework for their exploitation and

¹⁷⁰ The Commission confirmed that the reservoir rock and the physical condition of the oil and gas contain therein are almost identical to a non-recharging and confined aquifer. See ILC Report of the 59th session (2007) Official Records GA, 62nd session, Supplement No. 10 (A/62/10).

¹⁷¹ The questionnaire included the following 5 questions:

“1. Do you have any agreement(s), arrangement(s) or practice with your neighbouring State(s) regarding the exploration and exploitation of transboundary oil and gas resources or for any other cooperation for such oil and gas? 2. Are there any joint bodies, mechanisms or partnerships (public or private) involving exploration, exploitation or management of transboundary oil or gas? 3. If the answer to question 1 is yes, please answer the following questions on the content of agreements or arrangements and regarding the practice: (a) Are there any specific principles, arrangements or understandings regarding allocation or appropriation of oil and gas, or other forms of cooperation? (b) Are there any arrangements or understandings or is there any practice regarding prevention and control of pollution or regarding other environmental concerns, including mitigation of accidents? 4. Please provide any further comments or information, including legislation, judicial decisions, which you consider to be relevant or useful to the Commission in the consideration of issues regarding oil and gas. 5. Are there any aspects in this area that may benefit from further elaboration in the context of the Commission’s work? Shared natural resources: Paper on oil and gas (2009) prepared by Mr. Chusei Yamada, Special Rapporteur on shared natural resources, ILC Doc A/CN.4/608.

¹⁷² ILC Report Supplement No. 10 (A/62/10).

management would provide “legal clarity, and would help to foster peace and stability among States.”¹⁷³ It was precisely because such resources would have a “transboundary component and fortiori parts thereof would fall under the jurisdiction of another State that guidelines would be useful to provide adequate protection of the resource in question and promote cooperation in inter-State relations.”¹⁷⁴

Responses from State ranged from absolute support for the initiation of codification work¹⁷⁵ to the firm recommendation not to pursue any further work. Several States urged the Commission to be extremely cautious, as the question of shared oil and gas is bilateral in essence, highly technical and politically sensitive.¹⁷⁶ Mexico, Indonesia and the Nordic States stressed the urgency for universal rules and to include, among others, the concept of mandatory unitization.¹⁷⁷ The comments from the majority of States were essentially centered around five issues: (a) the importance of the similarities that could be drawn between aquifers and oil and gas; (b) whether the bilateral interests of the current States, affected by shared oil and gas deposits, posed significant hurdles for codification; (c) whether oil and gas issues could be separated from maritime delimitation; (d) whether oil and gas issues were suitable for codification; and (e) whether the political sensitivity and technical difficulty involved in oil and gas

¹⁷³ *ibid.* Iraq-Kuwait conflict over oil deposits at <<http://www.history.com/this-day-in-history/iraq-invades-kuwait>> accessed 8 January 2016

¹⁷⁴ Some States even highlighted that “there were already certain aspects in the law relating to transboundary aquifers which may be relevant in respect of the oil and gas, and that this was the case with regard to provisions on general principles, in particular concerning sovereignty, equitable and reasonable utilization, the obligation not to cause significant harm, as well as the general obligation to cooperate, even though in some instances the content of the rule or obligation may not be the same.” ILC Report Supplement No. 10 (A/62/10).

¹⁷⁵ The first group of States expected the Commission to take up the question of oil and gas. It was stated that there were similarities between groundwater and oil and gas, not only from a legal point of view but also from a geological perspective, and that, even if a cautious approach was advisable, the same general legal principles seemed to apply in both cases. ILC Doc A/CN.4/621.

¹⁷⁶ The second group of States, which formed a clear majority, asserted that the topic of oil and gas should not be addressed by the Commission. The reasons quoted by those States, while varying considerably, included the following points: (a) the question of oil and gas is essentially different from that of groundwater; (b) the issue is closely intertwined with the bilateral interests of the States involved; (c) it cannot be separated from boundary delimitation; (d) it is not suitable for codification; and (e) it involves political sensitivity and technical difficulty. *ibid.*

¹⁷⁷ The third group of States suggested that an analysis of various approaches taken under existing arrangements might lead to a set of common principles and best practices. *ibid.*

might be overcome by universal rules.¹⁷⁸ The 46 written replies to the questionnaire vary significantly, it was clearly evidenced the diverse attitudes of States towards THRs. Some delegations were not persuaded that further codification work by the Commission would bring added value.¹⁷⁹ It was noted that to try “to extrapolate customary international law, common principles or best practices from the divergent and sparse State practice in this area”¹⁸⁰ would contravene the bilateral interests of States.¹⁸¹

A middle ground approach was also suggested, with a number of delegations considering the need for common principles, that would assist States when negotiating bilateral agreements and summarize State practice.¹⁸² Finally, States that supported codification stress a need to the:

“ever-growing demand worldwide for natural resources, noting that any codification efforts would contribute to the maintenance of international peace and security, as well as the optimal use of such resources for the benefit of humankind. The complexity of the subject was acknowledged and its great relevance in the modern world was stressed. The high potential of an agreed set of rules in

¹⁷⁸ To a majority of States “transboundary oil and gas issues were essentially bilateral in nature, as well as highly political and technical, involving diverse situations. Doubts were expressed as to the need for the Commission to proceed with any codification exercise on the issue, including the development of universal rules. It was feared that an attempt at generalization would inadvertently lead to additional complexity in an area that may have been adequately addressed through bilateral efforts. Given that oil and gas reserves were often located on the continental shelf, there was also a concern that the subject had a bearing on maritime delimitation issues. Maritime delimitation, which, in political terms, was a very delicate issue for the States, would be a prerequisite for the consideration of this as sub-topic, unless the parties had mutually agreed not to deal with delimitation.” ILC Report Supplement No. (A/65/10).

¹⁷⁹ United Kingdom of Great Britain and Northern Ireland, Australia, Canada, Greece, United States of America and the Islamic Republic of Iran. Shared natural resources: Paper on oil and gas (2009) prepared by Mr. Chusei Yamada, Special Rapporteur on shared natural resources, ILC Doc A/CN.4/608.

¹⁸⁰ Report of the International Law Commission on the work of its sixty-first session (2010) Topical summary of the discussion held in the Sixth Committee of the General Assembly during its 64th session, prepared by the Secretariat, ILC Doc A/CN.4/620.

¹⁸¹ States were therefore “best able to negotiate agreements which reflected their interests and should thus continue to have the flexibility to create cooperative frameworks bilaterally, on a case-by-case basis. Experience in negotiating agreements in this area showed that, while States should be encouraged to cooperate with each other, the content of such arrangements and the solutions reached were largely the result of practical considerations based on technical information, which were bound to differ in accordance with the specificities of each case.” *ibid.*

¹⁸² *ibid.*

preventing conflict, the economic and political importance of the resource and the environmental considerations that the subject evoked were noted in particular. Such an exercise would also contribute to the establishment of an equitable and sustainable legal regime for States when sharing such precious and exhaustible resources.”¹⁸³

States in favour of codification also noted that any work must take into account the principle of permanent sovereignty over natural resources and the principle of cooperation on the basis of sovereign equality, territorial integrity, sustainable development, mutual benefit and good faith.¹⁸⁴ Further, other relevant principles included the precautionary principle, equitable and reasonable utilization and *sic utere tuo ut alienum non laedas*.¹⁸⁵ Surprisingly no consensus was achieved. Doubts were expressed over the need to adopt universal rules. It was feared that any attempt at generalization might inadvertently lead to complexity and confusion in an area that has historically been managed through bilateral efforts on a case-by-case basis. Consequently at its 62nd session in 2010, the Commission decided not to pursue any codification work on the subject of THRs.¹⁸⁶

3.5.2 A Need for a Model Agreement?

The BIICL published a model agreement of joint development of offshore hydrocarbon deposits with an explanatory commentary for the purpose of being used by academics, governments and legal practitioners. It was meant to offer a “practical, flexible and comprehensive solution to the development of offshore oil and gas resources where no general maritime boundary has been agreed between

¹⁸³ *ibid.*

¹⁸⁴ Art VI of the Draft Articles on the Law of Transboundary Aquifers, ILC 60th session (2008) Official Records of the General Assembly, 63rd session, Supplement No. 10 (A/63/10).

¹⁸⁵ ILC Doc A/CN.4/620.

¹⁸⁶ At its 69th meeting, on 27 July 2010, the Commission took note of the oral report of the Chairman of the Working Group on Shared Natural Resources and endorsed the recommendation of the Working Group on the basis of a working paper prepared by Mr. Shinya Murase (A/CN.4/621) to not pursue further work by the Commission on the topic of transboundary oil and gas. ILC Report Supplement No. 10 (A/65/10).

two costal States.”¹⁸⁷ The model agreement was intended as an instrument that States would use for negotiations and drafting of agreements on joint development. Its preparation was based on principles of international law, existing documentation on joint development and a survey and analysis of respective State practice.

With regard to petroleum conservation measures, the model agreement took into consideration two possible scenarios: a mandatory joint authority for the purpose of oversight and development of THRs; and a single joint operating venture to manage the joint development area. It also provided a comprehensive structure to guide States during negotiations and when choosing the relevant joint development regime. At the time it took into consideration the major provisions used in most joint development regimes in force to produce a comprehensive joint development framework with flexible variations to accommodate different scenarios.

Other studies have also tried to propose rules and standardize State practice. This is the case of the study of Anette Flormann-Pfaff that identified five different models for cooperation between States,¹⁸⁸ of the analysis provided by Gao Jianjun regarding the different types of joint development agreements,¹⁸⁹ and the attempts of the Puerto Vallarta Draft Treaty to provide universal codification for the development of THRs.¹⁹⁰ All of which provide great value to the study and potential codification work on THRs. There seem to be significant inconsistency between the different JDAs. From the surveys disparity is more acute in the method of appointment of the operator, apportionment of reserves and financial provisions; laws and guidelines to be applied, safety and health provisions, requirements for prohibiting pollution and protection of the marine environment.¹⁹¹ Overall it seems that the cooperative arrangements for the joint development of THRs correspond more to an achievable outcome, rather than to an aspired commitment. There is little guidance to the principles of international

¹⁸⁷ H Fox, *Joint Development of Offshore Oil and Gas* (BIICL 1990) II 1.

¹⁸⁸ A Flormann-Pfaff, *Lagerstätten im Völkerrecht: Joint Development: Zusammenarbeit bei anerkannten und streitigen Grenzen* (Duncker und Humblot, 1994) 201-209 in Becker – Weinberg (n 1).

¹⁸⁹ Jianjun (n 95) 41-45.

¹⁹⁰ A Szekely and others, ‘Transboundary Hydrocarbon Resources: The Puerto Vallarta Draft Treaty’ (1991) 31 NRJ 609.

¹⁹¹ Fox (n 187) 46.

law that must be included, being conservation and sustainable development a secondary priority, if any. Any systematization or codification would favour the implementation of certain essential legal principles and contribute towards the consolidation of State practice.

3.6. Conclusions

While under petroleum municipal laws States may impose detailed conservation measures, in international law and particularly in the law of the sea there is no rule requiring States to adopt mandatory petroleum conservation practices. Further, the analysis demonstrates that the States' discretionary powers to define the structure and legal framework applicable to the joint development of THRs have resulted in significant disparity between the agreements executed thus far. Essentially cooperative arrangements for the development of THRs have a functional economic and pragmatic character; they are not a direct result of an international obligation to impose petroleum conservation practices. States when negotiating agreements for the joint development of THRs do not abide to any "code of conduct" nor are guided to conduct themselves under essential principles of petroleum conservation. There are no reason why cooperative arrangements for the development of THRs should not envisage and enhance sustainable development principles, and above all evidence a respect to the environment and society as a whole. Further, joint development regimes should pursue the equal and equitable sharing of resources, take into consideration the needs of developing States to reduce the economic disparity between them, and adopt a holistic approach towards the protection of marine resources, with special concern on the protection of collective interests and be implemented for the benefit of mankind. The invaluable efforts from scholars to uniform rules and provide model contracts for the development of THRs must transcend to the formulation of petroleum conservation principles both at the municipal and international level, and particularly to the making of international framework agreements.

Chapter 4. Do Framework Agreements Effectively Apply Petroleum Conservation Principles?

4.1. Introduction

Development of transboundary natural resources has associated social, health, safety and environmental risks that transcend national boundaries. By nature, development in the natural resources sector is many times based on incomplete or uncertain information. The need for governance to protect the public and private interests and the environment as a whole is therefore high. Governance is now found throughout society and applies to governments, non-governmental organizations, corporate entities, industry associations, multilateral organizations and civil society groups. The term governance has come to be used frequently in many aspects of life and whilst there is no one standard definition general consensus is that governance covers all processes and actors involved in the taking of decisions, overseeing the actors who implement those decisions and the enforcement of such decisions.¹ Governance in the natural resources sector occurs through various bodies including governments, regulators, inter-governmental bodies, international governmental organizations,² international, multilaterals, and regional organizations, civil society groups and corporations. Governance institutions are indispensable for promoting welfare. Where development projects become international and transcend national boundaries the lack of governance institutions and principles creates complexities and uncertainties.³ A large amount of academic discussion exists on the precise meaning of effective or “good” governance. A common definition is provided by the UN which defines good governance as “participatory, consensus oriented, accountable, transparent,

¹ The Commission on Global Governance defines governance as “the sum of the many ways individuals and institutions, public and private, manage their common affairs ... [a] continuing process through which conflicting or diverse interests may be accommodated and co-operative action may be taken” *Our Global Neighbourhood: The Report of the Commission on Global Governance* (OUP 1995); The UN has defined governance as “the process of decision-making and the process by which decisions are implemented (or not implemented)”, Y Sheng, ‘What is Good Governance?’, UN ESCAP <www.unescap.org/pdd> accessed 27 October 2015; whilst another common definition of governance is provided by the OECD, “Governance is the exercise of political, economic and administrative authority necessary to manage a nation’s affairs.” Governance, The OECD Glossary of statistical terms < www.stats.oecd.org/glossary/detail.asp?ID=7236> accessed 20 November 2015

² NGO’s are established when two or more States execute a treaty and establish permanent secretariats to enact the matters of the treaty. E Benvenisti, *The law of global governance* (HAIL 2014) 25.

³ To B Sovacool and A Florini global energy governance “refers to the rules and actors related to energy that cross national borders.” ‘Examining the Complications of Global Energy Governance’ (2012) 30 JERL 235, 237.

responsive, effective and efficient, equitable and inclusive and follows the rule of law.”⁴

The *de rigueur* relationship between governance and sustainable development of natural resources is nowadays inconceivable. Governance, both local and global, plays a necessary role for the conservation of natural resources. When applied to the oil and gas sector, such definition encompasses “rule-making and enforcement that aims to overcome the collective action problems related to energy supply and use.”⁵ Each aspect of hydrocarbon conservation is in the public and private interest and therefore requires some form of governance. Conservation of hydrocarbon resources not only implies its sustainable development and use, but proper governance institutions and principles.⁶ Recent definitions of hydrocarbon conservation include not only the sustainable development of oil and gas reserves by maximizing reservoir production and minimizing project costs, but applying and enforcing best practice and the rule of law on social, health, safety and environmental matters.⁷ Petroleum conservation governance enhances effectiveness, increases legitimacy and compliance to ensure overall welfare. Governance in the development of THRs creates a system of “check and balances” between States for inter-governmental coordination and co-operation. It also provides opportunities for States to reduce “power disparities” among themselves. Overall, governance in cross-border development encourages the “development of stable mutual expectations regarding the future behavior of co-parties and reduces both bargaining costs and uncertainty.”⁸

The question is whether international agreements for the development of THRs evidence a clear and mandatory relationship between conservation and governance. Do recent international agreements include sound common

⁴ Sheng (n 1) at <www.unescap.org/pdd> accessed 27 October 2015. A further definition provided by the OECD states “Good governance is characterised by participation, transparency, accountability, rule of law, effectiveness, equity, etc.” Governance, The OECD Glossary of Statistical Terms at <www.stats.oecd.org/glossary/detail.asp?ID=7236> accessed 20 November 2015

⁵ Sovacool and Florini (n3) 237.

⁶ Refer to the following Section 4.2. What is Governance?

⁷ As discussed in Chapter 1, petroleum conservation under Article 4 of the Alberta Oil And Gas Conservation Act refers to: “(a) to effect the conservation of, and to prevent the waste of, the oil and gas resources of Alberta; (b) to secure the observance of safe and efficient practices in the locating, spacing, drilling, equipping, constructing, completing, reworking, testing, operating, maintenance, repair, suspension and abandonment of wells and facilities and in operations for the production of oil and gas or the storage or disposal of substances; (c) to provide for the economic, orderly and efficient development in the public interest of the oil and gas resources of Alberta; (d) to afford each owner the opportunity of obtaining the owner's share of the production of oil or gas from any pool; (e) to provide for the recording and the timely and useful dissemination of information regarding the oil and gas resources of Alberta; (f) to control pollution above, at or below the surface in the drilling of wells and in operations for the production of oil and gas and in other operations over which the Regulator has jurisdiction.”

⁸ Benvenisti (n 2) 22.

governance principles for the conservation of THRs? As discussed in Chapter 3, framework agreements are the latest form of bilateral instruments aimed to provide a comprehensive legal framework to promote cross-border development. This Chapter sets out to review framework agreements decision-making institutions and their role on transboundary hydrocarbon conservation matters. The Chapter focuses on three common governance themes: accountability, transparency and the application of the rule of law. It concludes by outlining the general governance format of the framework agreements and provides an opinion on whether conservation of THRs is governed effectively.

4.2. What is Governance?

Conservation principles are based upon sustainability which at its core embraces the idea of governance of human, environment and economic development.⁹ Governance refers to “processes, systems and actors involved in addressing collective problems that individuals and markets cannot solve for themselves, as well as making and enforcing rules”.¹⁰

Governance is a term which has seen its use grow ever wider “as the world has become more interlinked and globalized with States increasingly delegating regulatory powers to both formal and informal institutions governing different sectors of society at national, regional and international levels.”¹¹ This surrender of regulatory powers over matters of national sovereignty has an impact beyond political boundaries and has led to the rise of “global” governance with global bodies shaping the rights, interests and expectations of diverse stakeholders across political boundaries.¹²

The first forms of institutions requiring global governance were treaty based international governmental organizations, which are established when two or more States execute a treaty and establish permanent secretariats to enact the matters of the treaty.¹³ Others have since emerged such as international NGO’s that usually include boards and are typically funded by both the public and private

⁹ E Merino Blanco and J Razzaque, *Globalisation and Natural Resources Law Challenges, Key Issues and Perspectives* (Edward Elgar Publishing Inc, 2011) 51.

¹⁰ Sovacool and Florini (n 3) 237.

¹¹ Benvenisti (n 2) 25.

¹² *ibid* 25.

¹³ *ibid* 27 - Probably the first International Governmental Organization is the Central Commission for Rhine Navigation, established in 1804.

sectors. Further, there is also an increasing trend for governments to seek informal governance procedures without the legal strength of a bilateral treaty.¹⁴ The surrender of powers to these institutions and the legal obligations generated on the member States has recently created new governance challenges.

With this surrender and delegation of powers and growth of institutions and organizations with regulatory authority the need for effective or “good” governance has grown. However, what is it that determines whether good governance exists is more significant than ever. To UN good governance “promotes equity, participation, pluralism, transparency, accountability and the rule of law, in a manner that is effective, efficient and enduring.”¹⁵ The World Bank measures governance based upon six criteria: (1) voice and accountability; (2) political stability and absence of violence; (3) government effectiveness; (4) regulatory quality; (5) rule of law; (6) control of corruption.¹⁶ Although the definition of good governance varies, there are some common and universal themes. In this Chapter the governance concepts of accountability, transparency, participation and the rule of law will be focused upon with particular interest in the conservation of THR. Whilst these concepts are inherently linked, and on occasions are combined together,¹⁷ this study considers them equally important.

Accountability concerns the participation of a range of stakeholders in the decision making process. Stakeholders include governments and industry but also other key stakeholders such as civil society and professional associations. Who the stakeholders are differs for each governing body. A debate concerning who are the relevant stakeholders and who has the right to be heard normally centers on whether the decisions of a body have a direct or indirect impact on a specific stakeholder. The floodgates argument is frequently raised to restrict stakeholders to only those stakeholders directly affected. However there is wide recognition that rights to participate “are a necessary component of proper decision-making, a pervasive expectation that the public is entitled to participate effectively in decisions that affect it, and a firm conviction that because global governance

¹⁴ Benvenisti (n 2) 37-41.

¹⁵ Governance in Global Issues, United Nations at <www.un.org/en/globalissues/governance/> accessed 1 October 2015

¹⁶ The Worldwide Governance Indicators Project, The World Bank (WGI Project) <www.info.worldbank.org/governance/wgi/index.aspx#home> accessed 5 October 2015

¹⁷ The Natural Resources Charter provides a set of economic principles for governments and societies on how to best manage the opportunities created for natural resources development and combines accountability and transparency within precept two. ‘The Twelve Precepts’ in Natural Resource Charter, Natural Resource Governance Institute at <www.naturalresourcecharter.org/precepts> accessed 26 September 2015

creates democratic deficits, participatory rights are even more important than in domestic settings in protecting democracy.”¹⁸ Nowadays providing individuals a say in the rules that will regulate and/or affect their lives is considered essential for the public to respect and obey the authority of a governing agency.¹⁹ The participation of diverse groups during the decision making process legitimizes the regulatory authority under a more educated decision process.²⁰ More engagement and public participation ensures policy decisions are accepted as sufficiently legitimate to merit compliance.²¹

For effective stakeholder participation there is also the need for the disclosure and exchange of sufficient and reliable information, which rises to the overreaching concept of transparency. Exchange and disclosure of relevant information used in the decision process is just one arm of transparency; oversight of the decision making process, the background of those involved in the decision making process and the disclosure of the reasons and motivations behind such decision also exists. Overall the concept of transparency in each of these steps provides control and ensures authority within confined grounds. To Benvenisti the authority of institutions, whether global or local, should be defined by its constituent document and therefore any act beyond such authority may be declared invalid.²² The effectiveness “lies in the establishment of frameworks for exchange of information, mutual monitoring and frequent interaction”.²³

This leads to the applicability of the rule of law under a governance process. The applicability of the rule of law is seminal for the credibility of an

¹⁸ Benvenisti (n 2) 184.

¹⁹ Art 25 of ICCPR declared it a right to participate “in the conduct of public affairs.” This right is embedded in most constitutions and recognized as a human right and a *sien quanon* condition for development. International Covenant on Civil and Political Rights (adopted 16 December 1966, entered into force 23 March 1976) 999 UNTS 171 (ICCPR).

²⁰ *Mayagna (Sumo) Awas Tingni Community v. Nicaragua* (2002) AILR 12 the IACHR ruled that the Nicaragua government failure to consult the Awas Tingni community prior to granting a forest exploitation concession was in violation of Art 21 (Right to Property) and Art 25 (Access to Justice) of the ACHR and the indigenous community’s lack of a formal property titles did not preclude their participatory rights. Art 18 of the United Nations Declaration on the Rights of Indigenous People provides that “Indigenous peoples have the right to participate in decision-making in matters which would affect their rights” whilst Art 32 states “States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources” Declaration on the Rights of Indigenous Peoples, UNGA Res A/61/L.67 (13 September 2007) UN Doc A/61/L.67 <www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf> accessed 20 November 2015

²¹ Benvenisti (n 2) 27.

²² The ICJ has adopted an interpretative approach to determine whether limits of authority in constitutive treaties of International Governmental Organizations, such as the UN, recognized both explicit authority and implied powers essential for the performance of their duties. *ibid* 93-96.

²³ *ibid* 140. To Benvenisti transparency and public participation are instrumental to “enhance control over the decision-makers, thereby reducing slack and promoting the collective welfare. The other purpose is intrinsic: to respect the rights of individuals to have an opportunity, however small, to provide input on matters that shape their lives’ opportunities.” *ibid* 159.

organization, both at a municipal and international level.²⁴ Reliable definitions of the rule of law from institutions such as the United Nations²⁵, the World Justice Project²⁶, the World Bank²⁷ and the International Bar Association exist; common themes include principles of universal accountability to the law, independent application and competent enforcement of the law.²⁸

4.2.1. Governance and the Oil and Gas Sector

Oil and Gas activities have a large public interest. The development of natural resources transfers the wealth of nations from a resource *in situ* to export earnings. Investments in the oil and gas sector are large by nature and often based on incomplete or uncertain information. The needs for governance to protect both public and private interests whilst at the same time mitigate significant associated health, safety and environmental risks is complex and more apparent than ever. As in any global industry, the governance of oil and gas activities is based upon a tier of municipal, regional and international laws, guidelines and best practices from industry associations, and internal governance regulations of global, public and private entities and civil associations. A number of global and local actors and key stakeholders are involved. Benjamin Sovacool and Ann Florini identify six key actors within global energy governance.²⁹ First the international governmental organizations formed by bilateral and multilateral treaties. Second, government summits, which do not have the formality of a treaty and are considered more flexible. Third are the international NGO's. Fourth are the multilateral financial institutions such as the World Bank and regional development banks which condition loans tie to governance conditions. Fifth are regional organizations such as ARPEL in Latin America which provide operational guidelines for their regional

²⁴ "Where rule of law is strong, people uphold the law not out of fear but because they have a stake in its effectiveness" M Johnston, 'Good Governance: Rule of Law, Transparency, and Accountability' (2006) UPAN <<http://unpan1.un.org/intradoc/groups/public/documents/un/unpan010193.pdf>> accessed 1 November 2015. The application of rule of law at a national level provides the citizens of a State confidence in their government and the application of national laws whilst internationally the application of the rule of law is now a day essential if a State wants to encourage international investment and development.

²⁵ United Nations and the Rule of Law, UN <<https://www.un.org/ruleoflaw/>> accessed 28 September 2015

²⁶ What is the Rule of Law?, World Justice Project <<http://worldjusticeproject.org/what-rule-law>> accessed 28 September 2015

²⁷ WGI Project <<http://info.worldbank.org/governance/wgi/index.aspx#doc>> accessed 28 September 2015

²⁸ R Belton, states that "the rule of law is not a single, unified good but is composed of five separate, socially desirable goods, or ends: (1) a government bound by law, (2) equality before the law, (3) law and order, (4) predictable and efficient rulings, and (5) human rights." 'Competing definitions of the rule of law implications for practitioners' (2005) 55 Carnegie Papers, Rule L Series <<http://carnegieendowment.org/files/CP55.Belton.FINAL.pdf>> accessed 28 September 2015

²⁹ Sovacool and Florini (n 3) 239.

members. The sixth category is effectively a catch-all category which they refer to as hybrid entities which combine some of the other five types of governance together.³⁰ Governments and regulators are presumably excluded from the list as they refer to global and not municipal governance. Interestingly transnational corporations are also purposely excluded from the list.³¹ However, which international and municipal laws, regulations and guidelines are more suitable for petroleum development? Along with the complex number of global and local actors involved, have recently challenged the petroleum industry towards a more unified, harmonized and coordinated governance.

The recent Gulf of Mexico Macondo blowout on the Deepwater Horizon platform³² provides a clear illustration of the inconsistency in associated health, safety and environmental governance procedures. BP as operator had contracted Transocean as the drilling contractor for the Macondo well. During discussions over shutting down the well employees of BP and Transocean suggested different health and safety procedures that led to a heated disagreement and a few hours later a major well-blowout occurred.³³

The Macondo incident evidences the complexity of oil and gas governance. In the Macondo incident there were five main companies involved. BP were the lease holder and operator and had contracted Transocean as the drilling contractor and Halliburton and their subsidiary Sperry-Sun Drilling Services to provide other well services such as cementing and well monitoring services. Transocean had contracted a blowout preventer from Cameron as part of its contractual requirements with BP. In addition to having different companies with different nationalities and different internal governance procedures involved, there were also a number of different regulators. In the Macondo incident the US Minerals Management Service was the main regulator and was overall responsible for safety and environmental protection of offshore activities. The regulator

³⁰ Sovacool and Florini provide various examples of these hybrid entities including the International Institute for Energy Conservation which is funded by governments, community groups and members of civil society and assists both public and private sectors implementing energy efficiency, transport and environmental policies. *ibid*.

³¹ To Sovacool and Florini, a global or transnational corporation scope of influence is "often indirect as global governance concerns are secondary to profits and national policy" *ibid* 239.

³² Investigation Report Volume 1 Explosion and Fire at the Macondo Well <http://www.csb.gov/assets/1/7/Vol_1_Final.pdf> accessed 25 July 2015; Investigation Report Volume 2 Explosion and Fire at the Macondo Well <http://www.csb.gov/assets/1/7/Vol_2_Final_Version.pdf> accessed 25 July 2015

³³ A unified health and safety governance procedure for the project may have reduced the probability of the incident.

prescribed guidelines which it then audited, but due to technological advances in the sector many of its regulations were outdated.

The number of actors, guidelines, corporate procedures and different regulators involved in major oil and gas projects presents a serious and urgent problem for governance. The sheer number of actors and regulators addressing similar governance issues have led to a fragmented authority and often altogether lacking. Accountability, transparency and applicability of the rule of law tends to be insufficient and inconsistent. To a number of commentators global energy governance “barely has clearly defined processes, rules for regulation, and interference.”³⁴

One promising area of inquiry, particularly for the adequate governance of THRs is a “polycentric” approach. Elinor Ostrom suggests a “polycentric” approach to governance where no single scale but a blending of scales creates effective forms of accountability, transparency and applicability of the rule of law. Polycentric approaches imply that “the sharing of power between numerous scales of governance must be seamlessly interwoven, resulting in a ‘polycentricity’ or ‘nestedness’ that involves multiple authorities and overlapping jurisdictions.”³⁵

As framework agreements seek to establish unified and coordinated development of THRs, a polycentric approach along with regulatory harmonization and institutional coordination is likely to improve transparency and accountability. Further an old but renewed challenge to accountability and transparency in petroleum governance is the inclusion of public participation regarding fundamental human rights, self-determination, and the role of environmental impact assessments in a transboundary context.³⁶ Inferred from the recognition of the dignity of every person, this implies the “right to take part in the government of his country, directly or through freely chosen representative”³⁷ in development matters. Focusing on environmental matters, it emphasizes the

³⁴ A Goldthau and B Sovacool, “The uniqueness of the energy security, justice, and governance problem” (2012) 41 Energy Pol’y 232-240; Sovacool and Florini (n 3) 252.

³⁵ To Ostrom the “justification behind polycentric approaches is that conventional forms of governance such as top-down centralised control, bottom-up decentralised control and even free market privatisation have inescapable flaws in isolation. Evidence has begun to emerge that polycentric and ‘networked’ approaches, not purely regional or local ones, can encourage plurality, promote dialogue, ensure redundancy and enhance accountability needed to respond to energy and climate dilemmas.” Sovacool and Florini (n 3) 261.

³⁶ A Boyle ‘Human Rights or Environmental Rights A Reassessment’ (2007) 18 Fordham Envtl L Rev 471, 497.

³⁷ Universal Declaration of Human Rights, UNGA Res. 217 A(III) (10 December 1948) UN Doc A/RES/3/217A art 21 (1).

right of every person “to live in an environment adequate to his or her health and well-being and to be able to assert this right.”³⁸ It further recognizes that:

“... in the field of the environment, improved access to information and public participation in decision-making enhance[s] the quality and the implementation of decisions, contribute[s] to public awareness of environmental issues, give[s] the public the opportunity to express its concerns and enable[s] public authorities to take due account of such concerns.”³⁹

Aiming to the strengthening of accountability, transparency and public support in any decision-making process, today there is no doubt that public participation in the assessment of any potential environmental impact along with the recognition and inclusion of fundamental human rights plays a fundamental role in petroleum governance.⁴⁰

4.3. Petroleum Conservation Governance within Framework Agreements

Governance within framework agreements covers a series of matters including, but not limited to, resource allocation, development plan approval, decommissioning, fiscal oversight, health, safety and environmental regulations, use and interconnectivity with existing infrastructure, and mainly petroleum conservation principles such as unitization.⁴¹ Petroleum conservation governance is closely aligned with the notion of sustainable development. Yet the question remains whether such framework agreements evidenced common grounds for “good” governance, including clear decision-making processes, accountability, transparency, public participation, and the application of the rule of law.

³⁸ Aarhus Convention Preamble.

³⁹ *ibid.*

⁴⁰ art 6 of the Inter-American Democratic Charter (adopted 11 September 2001, entered into force 12 December 2001) 119 UNTS 3 (ICD), states that “it is the right and responsibility of all citizens to participate in decisions relating to their own development. This is also a necessary condition for the full and effective exercise of democracy.” This includes information and accountability to “include environmental impact assessment where a development project may affect rights, which should include public access to the finding of such studies.” art 3(8) and art 4(2) of the Espoo Convention. Benvenisti (n 2) 184.

⁴¹ Unitization requires where there are multiple licensees of an oil or gas reservoir to operate the reservoir as if the reservoir were owned by a single licensee and name one of the licensees as the Unit Operator.

The following Framework Agreements are examined: 2005 UK - Norway; 2005 France - Canada; 2007 Trinidad & Tobago - Venezuela; 2008 Iceland - Norway; 2012 Norway - Russia; and 2012 US - Mexico. In this section each framework agreement will be analyzed to determine common governance practices and goals, if any, with a particular focus being given to petroleum conservation principles. As a framework agreements objective is to unify the development of THRs specific mention will be given to governance procedures over unitization and the associated reserve allocation between sovereign States. The reserve allocation has an important role in not just determining the production allocation but also the corresponding allocation of the different governments fiscal systems which play a major role determining overall project sustainability and the corresponding fiscal earnings of each government. The importance of this decision should not be underestimated and considering the initial decision is going to be taken upon incomplete and uncertain geological data the governance procedures should permit for some form of review as knowledge levels increase.

4.3.1. 2005 United Kingdom - Norway

The UK-Norway North Sea Co-operation Workgroup was entrusted by the governments of both countries to review their cooperation options “for the optimum development of the North Sea.”⁴² One of their recommendations was the creation of a Framework Treaty and a set of parallel guidelines to facilitate cross-border opportunities.⁴³ In April 2005 the Framework Agreement between UK and Norway was ratified and came into force in July 2007, becoming the first framework agreement on THRs. The North Sea is a mature producing area with considerable infrastructure in place. The aim of the treaty is to encourage investment in marginal THRs by providing a clear legal framework to reduce project costs and encourage the efficient use of existing infrastructure.

The UK - Norway Framework Agreement establishes a Framework Forum to manage operations and provide for continuous consultation and exchange of

⁴² Unlocking Value through Closer Relationships, Report of The UK-Norway North Sea Co-operation Workgroup (August 2002) 3
<<http://webarchive.nationalarchives.gov.uk/20101227132010/http://www.pilottaskforce.co.uk/files/workgroup/308.pdf>>
accessed 25 January 2016

⁴³ *ibid.*

information.⁴⁴ It is also the first step for conflict resolution prior to dispute settlement.⁴⁵ The agreement establishes that the Forum be comprised of government representatives but lacks elements of transparency by failing to detail the background of the Forum members, the Forum's decision making manner and the level of authority of the Forum.⁴⁶ Without knowing the members of the Forum and its powers it is also uncertain how the Forum will apply the rule of law. The Forum's role is limited as it is only required to meet twice a year or as agreed by both governments.⁴⁷ The value in the Forum's decision-making abilities, decision making authority and conflict resolution is questionable.

The reach of the Framework Forum is left ambiguous and is subject to further arrangements which governments may agree. Where it does have a clear and transparent mandate is to act as the arbitrator ensuring contractor selection for pipeline expansions under the Annual Shipping and Transportation Plan.⁴⁸ The Forum has implied authority with regards to the setting of regulated exit points and exit tariffs and helping resolve disputes in this area since whilst the relevant articles⁴⁹ do not refer to the Forum, the Dispute Settlement provisions state that where the "Framework Forum has been unable to resolve a disagreement between the two Governments on the matter in question" a Conciliation Board shall consider the matter.⁵⁰

Throughout the agreement both governments are declared responsible for various decisions and key activities. For example the two governments shall use their best efforts to facilitate Cross Boundary Projects,⁵¹ encourage common health, safety and environmental standards,⁵² approve metering systems,⁵³ set physical security⁵⁴ and facilitate the use of existing infrastructure.⁵⁵ It is not clear how the Framework Forum could manage many of these areas of government responsibility, leaving an open question as to the level of implied authority given

⁴⁴ Framework Agreement between Norway and the United Kingdom concerning Cross-Boundary Petroleum Co-operation (adopted 4 April 2005, entered into force 10 July 2007) text registered with the UN No. 44683 (UK - Norway Framework Agreement) art 1(15).

⁴⁵ *ibid.*

⁴⁶ *ibid* art 1(15) provides that other parties may attend the forum as appropriate and whilst presumably this is to advise the forum no further details are given.

⁴⁷ *ibid.*

⁴⁸ *ibid* Annex A, art 8.

⁴⁹ *ibid* arts 2(6) and 2(7).

⁵⁰ *ibid* art 5(2).

⁵¹ *ibid* art 1(4)(1).

⁵² *ibid* art 1(5)(2).

⁵³ *ibid* art 1(7)(1).

⁵⁴ *ibid* art 1(8).

⁵⁵ *ibid* art 1(12)(1).

to the Forum. This lack of clarity over the plenary organ makes it unclear whether the treaty wished to establish an inter-governmental body with full decision power and authority or maintain some sort of governmental control over the treaty administration.

Where the two governments agree there is a THR the framework agreement requires a unitization agreement, however it is not quite mandatory since the governments may agree otherwise.⁵⁶ Should a unitization agreement be required the Licensees are to produce and submit this for approval by both governments.⁵⁷ A governance void exists concerning this crucial matter with no details provided on who or how the governments determine if a unitization agreement is needed and who or how the resultant agreement is to be approved. The seriousness of this failing is emphasized by the fact that it is the licensees that propose the reserve allocation and establish procedures for its redetermination within the unitization agreement.⁵⁸ The only specific governance element requires an independent expert to be appointed if the governments disagree on the reserve allocation or its redetermination.⁵⁹

If there is a disagreement on reserve characteristics, volume of reserves or the reserve allocation between nations the agreement establishes that an independent expert can be appointed.⁶⁰ Before this happens there is the possibility for stakeholder input and consultation with the licensee duly notified and given the chance to propose an alternative option.⁶¹ Annex D provides a procedure for the selection of the expert, which requires an expert to be agreed upon by both governments, or if that fails the President of the *Institut Français du Pétrole* or other agreed body will determine who should be the expert. The intention to have an independent and competent adjudicator is clear and in line with good governance practices. There are also provisions providing transparency over the experts' decision. The expert is required to provide a written report of their preliminary decision and the reasoning to both governments to allow the

⁵⁶ *ibid* arts 3(1)(1), 3(10).

⁵⁷ *ibid* art 3(2) refers the unitization agreement as the "Licensees' Agreement".

⁵⁸ *ibid* art 3(3).

⁵⁹ *ibid* art 3(4).

⁶⁰ *ibid* art 3(4).

⁶¹ Initially the Governments have 60 days to approve or reject the Licensees' Agreement which incorporates the THR characteristics and must notify the Unit Operator if they reject the proposals. *ibid* art 3(2). After the notification the governments and Unit Operator have a further 60 days to find an agreement before the independent expert is appointed. *ibid* art 3(4).

governments to make observations before a final decision and the corresponding report is issued. For reasons of transparency the expert may only meet one government in the presence of the other and all written communication will go with a copy to both governments. There is no mention on whether the Unit Operator should be involved in the discussions which, considering that the Unit Operator is one of the main parties obligated to act based upon the binding decisions of the expert,⁶² it appears poor governance as the decision will affect the reserve allocation between States and its sustainability.

The agreement provides for dispute settlement via a Conciliation Board for disputes other than those to be resolved by an independent expert.⁶³ The Board is formed of two members designated by each government and a fifth Chairperson designated by this group.⁶⁴ To improve the independence of the Board the Chairperson may not be a national or reside in either nation.⁶⁵ The failure to nominate the Chairperson within a specified time frame allows the President of the ICJ to designate such individual. Whilst timings are set for the election of the members the agreement only requires the Board to make a decision within a reasonable time limit.⁶⁶ Therefore whilst decisions maybe taken by a simple majority the failure to set a maximum time limit to do so presents a process weakness. There are further steps to develop a transparent process since the Board is entitled to “all relevant information” and can carry out the “necessary consultations” which allows, but does not obligate, the involvement of other stakeholders.⁶⁷

The concept of transboundary hydrocarbon conservation is supported by the obligation of the licensees to agree on a Unitization Agreement⁶⁸ for the development of THRs. This Unitization Agreement is subject to approval from both governments and the provisions on the THR characteristics, reserve volumes and allocation between the nations is subject to expert review.⁶⁹ Although the Unit Operator is a key party they are not guaranteed any involvement in the experts

⁶² The decision of the expert is binding except in the cases of fraud or manifest error.

⁶³ *ibid* art 5.

⁶⁴ *ibid* art 5(1)(ii).

⁶⁵ *ibid* art 5(1)(ii).

⁶⁶ *ibid* art 5.

⁶⁷ *ibid* art 5(1)(v).

⁶⁸ Whilst the Framework Agreement does not mention a Unitization Agreement within art 3 it refers to Unitization and a Licensees' Agreement between licensees to jointly exploit a THR.

⁶⁹ *ibid* arts 3(3)(1), 3(4).

review. The agreement strongly supports the idea of minimizing environmental surface impact by using existing infrastructure. Governments must approve this and any associated Development Plan.⁷⁰ The State which has territorial jurisdiction over existing facilities must approve matters taking due account of the issues expressed by the other State.⁷¹ Nonetheless this requirement is vague as there is no definition of who in the government has authority and the process they should follow. In the case of a dispute a clear process does exist, as the matter would follow the Dispute Settlement provisions mentioned above. Where existing infrastructure is used or a cross border pipeline is needed authorizations from both governments is required.⁷² Equally there are other key instances where the approval of both governments is mandatory, for example the authorization of the Licensees' Agreement, the designation of the Unit Operator and its Development Plan.

On health, safety and environmental matters the agreement includes that the standards of both States must be met.⁷³ Each nation's health, safety and environmental laws apply at all times without exception. The Framework Agreement Guidelines support this, as exploration drilling, flaring and decommissioning require that national law, depending upon the facilities location, be applied at all times. Where facilities lie across national boundaries, governments "shall seek to ensure their respective standards and requirements are compatible"⁷⁴ and that "appropriate procedures are in place for the safety and health of personnel."⁷⁵ Sadly without placing any timing on the issue or review and or approval system, creating an extra layer of governance over such competent authorities.

4.3.2. 2005 France - Canada

The Saint Pierre and Miquelon archipelago is a French territory to the south of Newfoundland in Canada which shares THRs with Canada. Between April 2000 and July 2003 the nations negotiated a framework agreement which was executed in May 2005, a little over one month after the UK- Norway Framework Agreement.

⁷⁰ *ibid* arts 4(1), 4(2).

⁷¹ *ibid* art 4(3).

⁷² *ibid* arts 2(1), 4(1).

⁷³ *ibid* art 1(5)(1).

⁷⁴ *ibid* art 1(5).

⁷⁵ *ibid* art 1(5).

Nonetheless the agreement still requires ratification to be put into force. Along with the UK - Norway Framework Agreement this is one of the initial framework agreements that had little past precedents.

The France - Canada Framework Agreement⁷⁶ in its preamble recognizes the importance of dispute resolution means and a time frame for these procedures so as not to delay the development of THRs. The agreement establishes three forms of oversight, an independent expert for resolving matters relating to THRs, an arbitration process for matters in the exploitation agreement, development plan, and plan de *valorisation économique*⁷⁷, and finally a working group for other consultations. What the framework agreement fails to establish is a plenary inter-governmental body for day-to-day operations of the agreement and instead it is the governments who take on this responsibility and refer matters to other institutions when considered appropriate. Both governments must approve the Exploitation Agreement,⁷⁸ the Unitization Agreement,⁷⁹ changes to the Unit Operator,⁸⁰ the Unit Operators estimate of the reserves and the Unit Operators suggested allocation of reserves between nations.⁸¹ In this way the agreement is similar to the UK-Norway agreement in that it establishes a mandatory requirement for a unitization agreement⁸² without establishing any governance procedures on how this is to be done. The extent of the unitization agreement can be limited by the governments since it only applies the area determined by the governments in the Exploitation Agreement which the governments may restrict.⁸³ As per the UK-Norway Framework Agreement each government must approve the Unit Operators proposal on reserve allocation,⁸⁴ but whom within the government and how this is done is undefined even though a dispute procedure involving a binding decision by an independent expert is defined.⁸⁵ A redetermination of the allocation can be requested by either government, but not the operator, at dates

⁷⁶ L'exploration Et L'exploitation Des Champs D'hydrocarbures Transfrontaliers, Projet De Loi Autorisant L'approbation De L'accord Entre Le Gouvernement De La République Française Et Le Gouvernement Du Canada (adopted 18 July 2007) Rapport n° 395 (2006-2007) (France-Canada Framework Agreement).

⁷⁷ *ibid*, Benefits Plan.

⁷⁸ *ibid* art 4(3).

⁷⁹ *ibid* art 5(2).

⁸⁰ *ibid* art 6(3).

⁸¹ *ibid* art 8(1).

⁸² *ibid* art 4(1) (translated) states "No Party will be able to start commercial production activities in the transborder field before an exploitation agreement is agreed for the field" and Art 5 requires the licence holders to conclude a Unitization Agreement.

⁸³ *ibid* art 4(3) (translated) states "An exploitation agreement applies to the full scope of the transborder field to which it relates, unless the parties agree otherwise."

⁸⁴ *ibid* art 8(1), 8(2).

⁸⁵ *ibid* art 8(3).

specified in the Exploitation Agreement using the same process as per the initial allocation.⁸⁶ The agreement only provides that an Exploitation Agreement should contain an obligation to exchange information⁸⁷ but provides no guidance on further content and therefore the possibilities for redetermination of the reserve allocation are left for the governments to determine in each Exploitation Agreement.

The independent expert at the request of a government may review the proposals of the Unit Operator detailing the location and size of the reserve and its allocation between the nations.⁸⁸ The decision of the expert is final and binding.⁸⁹ No details are provided on how the independent expert should arrive at such decision and there is no requirement to meet with key stakeholders when considering their final decision. Appendix III of the Agreement provides a clear transparent procedure for the appointment of the expert and sets out strict timelines over the appointment. The Agreement establishes some accountability measures and requires the expert to provide a preliminary report to the governments to allow them to provide inputs before the final decision⁹⁰ and where the matter is one relating to the Unitization Agreement the experts decision will also be communicated in writing to the Unit Operator.⁹¹ The Agreement also stipulates that the expert should consider all data presented by governments but fails to mention if such information should be communicated to the Unit Operator. The expert decision will determine the allocation of reserves between the two nations.⁹²

The Agreement provides for either of the governments to request arbitration where the governments failed to finalize an exploitation agreement⁹³ or agree upon a development plan or *plan de valorisation économique*⁹⁴ or a modification of such plans.⁹⁵ The arbitration format is covered in detail under Appendix IV and stipulates that a sole arbitrator be named by the governments, if they fail to agree on a sole arbitrator they each nominate an arbitrator and those

⁸⁶ *ibid* art 8(7).

⁸⁷ *ibid* art 4(2).

⁸⁸ *ibid* art 8(3).

⁸⁹ *ibid* art 8(4).

⁹⁰ *ibid* art 12.

⁹¹ *ibid* art 8(5).

⁹² *ibid* art 15.

⁹³ *ibid* art 4(5).

⁹⁴ *ibid* art 9(1).

⁹⁵ *ibid* art 9(3).

arbitrators select a third who chairs the arbitration. Should the named arbitrators be unable to agree on a Chairman the President of the ICJ may be asked to appoint the arbitrator. This level of detail provides transparency to the process and the inclusion of both governments in the process provides accountability, however failure to include the Unit Operator opinion in such seminal issues evidences poor participation. Detailed rules on how the arbitration process will occur are provided. The ruling of the court is final and binding.⁹⁶ This again evidences how the decision-making process is focused solely on governments' interests. There is no consideration of key stakeholders such as the Unit Operator, who takes on the risks of project development, and public engagement and participation is completely absent.

A technical working group meets when required by one of the governments or required by the agreement and is formed by a secretary and president from each government.⁹⁷ The failure to appoint an independent chair and the even number of working group members limits decisions-making capabilities of the working group. The agreement also fails to provide any transparency on how the working group should make its decisions, for example whether majority decisions are required or not. The working group functions are to discuss and review the geological data contained within Annex I of the agreement,⁹⁸ facilitate the approval of the development plan and the plan de *valorisation économique* and provide recommended changes to both plans.⁹⁹ Whilst not an obligation the working group may invite the Unit Operator to participate in discussions over these plans.¹⁰⁰ Another governance measure is the establishment of a clear procedure to summon the working group.¹⁰¹ Further the working group has authority is concerning the determination of THRs. If after two exploratory wells a government fails to notify the other whether they consider a THR exists¹⁰² the working group should be summoned by one of the governments to review the information. Whilst the decision of the working group on whether or not a THR exists is not binding each government has the option to appoint an

⁹⁶ *ibid* arts 19, 20.

⁹⁷ *ibid* arts 17(1), 17(2).

⁹⁸ *ibid* art 17(3)(a).

⁹⁹ *ibid* art 17(3)(b).

¹⁰⁰ *ibid* art 17(3)(b).

¹⁰¹ *ibid* art 17(5).

¹⁰² *ibid* arts 2(1)(b), 3(1).

independent expert to review the working group decisions and make a binding decision on the matter.¹⁰³

Petroleum conservation principles include the need for a Unit Operator to submit a *plan de valorisation économique*. This is a positive measure as it contemplates the economic impact of the area. Although transparency and accountability of the *plan de valorisation économique* are not mentioned. Governance on health, safety and environmental provisions is almost entirely absent. The agreement only mentions that the governments will consult each other and then apply municipal laws on safety¹⁰⁴ whilst on environmental protection the governments must take all necessary measures to minimize marine environmental impacts and consult each other how they will implement such measures.¹⁰⁵

The Agreement also mentions the need to set up an inter-governmental arrangement to fulfill obligations concerning Environmental Impact Studies required by the Espoo Convention.¹⁰⁶ However no direct authority to act is given to any inter-governmental body and no procedures are set in place, which questions whether either will ever happen.

4.3.3. 2007 Trinidad and Tobago - Venezuela

In 2007 the T&T - Venezuela Framework Agreement was agreed with the aim of providing a comprehensive framework for the development of three known THRs: Kapok-Dorado, Manakin-Coquina and Loran-Manatee. The agreement has been partially successful with a Unitization Agreement for the THR Loran-Manatee executed in 2010.

Governance of the agreement is provided by Article 5 which establishes inter-governmental bodies to resolve disputes and oversee THR development. A Ministerial Commission comprised of the Energy Minister and one more senior official from each country is given overall responsibility for the implementation of the agreement. This suggests that the Ministerial Commission has the authority to take all relevant decisions with almost unfettered powers. The determination of an

¹⁰³ *ibid* art 3(2).

¹⁰⁴ *ibid* art 11.

¹⁰⁵ *ibid* art 13.

¹⁰⁶ Espoo Convention requires that affected parties cooperate with each other prior to acting and implement national EIA procedures that allow for the integration of foreign impacts and foreign actors. The State where the proposed activity is to take place should approach affected States and inform them of adverse transboundary impacts and invite them to participate in an EIA. The convention has been ratified by 44 States and the European Union.

area to a THR and its corresponding allocation partially support this argument, as governments are required “through the Ministerial Commission” to consult “with a view to agreeing” such matters.¹⁰⁷ This however is the only time the agreement requires governments to agree a seminal matter through the Ministerial Commission. It is unclear just how much authority the Ministerial Commission is being delegated. In fact the only other explicit task of the Ministerial Commission is to play a role in consultations or negotiations on Dispute Resolution but no further details are provided as to how they should do this.¹⁰⁸

The aim of the treaty is to establish mandatory Unitization Agreements for THR development. The agreement stipulates that Unitization Agreements are to be “executed by the Ministers responsible for the energy and hydrocarbon sector.”¹⁰⁹ These Ministers sit on the Ministerial Commission. In order to attain consensus within both governments, the Ministerial Commission shall meet at least twice a year.¹¹⁰

An operative body is also contemplated by the agreement. The Ministerial Commission shall establish a Steering Commission which will meet at least every two months.¹¹¹ The Steering Committee procedures and delegated authorities are to be determined by the Ministerial Commission.¹¹² The Steering Commission comprises at least six members, three designated by each government’s energy ministries and decisions must be taken unanimously.¹¹³ The role of the Steering Committee is to carry out the functions designated to it by the Ministerial Commission¹¹⁴ and to play a role in consultations or negotiations on Dispute Resolution.¹¹⁵ The intention of the agreement is for the Steering Committee to act as a check and rubber stamp on the Ministerial Commission decisions. This is supported as the agreement states that the purpose of the Steering Committee is “facilitating the implementation of this Treaty”.¹¹⁶

¹⁰⁷ Framework Treaty relating to the Unitization of Hydrocarbon Reservoirs that Extend Across the Delimitation Line between the Republic of Trinidad & Tobago and the Bolivarian Republic of Venezuela (adopted 20 March 2007, entered into force 16 August 2010) text registered to the UN No. 50195 (T&T – Venezuela Framework Agreement) art 3(2)(1).

¹⁰⁸ *ibid* art 21(1).

¹⁰⁹ *ibid* art 2(3).

¹¹⁰ *ibid* art 5(2).

¹¹¹ *ibid* art 5(5).

¹¹² *ibid* art 5(4).

¹¹³ *ibid* art 5(5).

¹¹⁴ *ibid* art 5(4)(3).

¹¹⁵ *ibid* art 21(1).

¹¹⁶ *ibid* art 3(2)(1).

The second meeting of the Steering Committee took place in July 2013¹¹⁷ which considering the agreement was ratified in 2007 and that the Steering Committee is meant to meet every two months, it raises concerns over the agreement governance processes. A factor behind this lack of Steering Committee meetings may stem from the agreement failure to incorporate timeframes for most of its actions.

Since the Steering Committees are comprised of members from the Ministries one would expect them to include politicians and technocrats¹¹⁸ and therefore require technical advice to resolve some matters. The agreement is conscious of this need and allows the Steering Committee to establish working groups for each THR and employ industry experts to advice on implementation actions¹¹⁹ and for the governments to jointly consult experts to determine the allocation of THRs.¹²⁰ The transparency requirement to determine the selection and the background of these industry experts and working groups is missing. The only item stipulated is that there should be a Reservoir Technical Working Group to provide recommendations to the Steering Committee on the determination of the Unit Area and reserve allocation.¹²¹

In relation to petroleum conservation principles the governments must approve the mandatory Unitization Agreement,¹²² Unit Operator,¹²³ and Development Plan.¹²⁴ Whilst no governance process is provided for the governments to agree a Unitization Agreement the governance process for determining the unit area and reserves allocation is based upon the submittal of recommendations from the Reservoir Technical Working Group to the Steering Committee and then to the Ministerial Commission for their final review.¹²⁵ If after

¹¹⁷ Media Release from Government of the Republic of Trinidad and Tobago Ministry Of Energy And Energy Affairs, 'T&T And Venezuela Hold Second Meeting Of The Joint Steering Committee For The Unitization Of Cross Border Hydrocarbon Reservoirs' (2013)

<http://www.energy.gov.tt/wpcontent/uploads/2013/11/TT_&_Venezuela_Meet_on_Unitisation_of_Cross_Border_Hydrocarbon_Reservoirs.pdf> accessed 1 October 2015

¹¹⁸ The media release supports this as Mr. Angel González Saltrón, Vice Minister of Hydrocarbons, People's Ministry for Energy and Petroleum of Venezuela acted and Mr. Selwyn Lashley, Permanent Secretary of the Ministry of Energy and Energy Affairs of Trinidad and Tobago acted as co-chairpersons for the Steering Committee meetings. *ibid*

¹¹⁹ T&T – Venezuela Framework Agreement art 5(6).

¹²⁰ *ibid* art 3(3).

¹²¹ *ibid* art 3(2)(1).

¹²² *Ibid* art 2(3) "the Parties shall conclude, specific Unitization Agreements for the exploitation and development of Cross-border Hydrocarbon Reservoirs within the Unit Area" and the governments determine what is the "Unit Area" under art 3(2)(1); art 3(1)(a) requires THRs to be exploited "as a single unit" and art 3(4)(2) requires the operators to enter a "Unit Operating Agreement."

¹²³ *ibid* art 3(5).

¹²⁴ *ibid* art 10(5).

¹²⁵ *ibid* art 3(2)(1).

a reasonable time the governments have not agreed on the matter¹²⁶ it may be referred for dispute settlement. The dispute settlement process has no defined process¹²⁷ and requires the Steering Committee, Ministerial Commission and governments to find an amicable solution, yet considering that these parties have already reviewed the issue there is the potential for no agreement to ever be reached. With regards a redetermination of the allocation both governments, but not the operator, are permitted to request this but no governance process is described as to how this should occur.¹²⁸

Governments also approve petroleum conservation matters related to minimizing project costs from the sharing of infrastructure and provision of third party access.¹²⁹ The importance of this can be seen from the Unitization Agreement on THR Loran-Manatee which whilst not referring to third party access has led to statements from the Venezuelan government saying they will share and use existing infrastructure to send their gas to the Atlantic LNG facility in Trinidad.¹³⁰ The agreement reiterates the obligation to minimize environmental impact¹³¹ but fails to determine a responsible party for oversight. The governments must approve a decommissioning plan¹³² which would normally include environmental considerations, but no details are included in the Agreement. The responsibility is placed upon the Unit Operator to incorporate and implement the relevant measures and procedures taking into account applicable laws, international standards and practices.¹³³ This ambiguous statement whilst placing the burden on the Unit Operator then establishes insufficient oversight with only the need to meter flaring.¹³⁴

Municipal health and safety laws and internationally accepted standards and regulations apply. Exploration and production companies are required to “jointly formulate and implement health and safety policy and procedures.”¹³⁵ In the Macondo blowout the failure to have unified policies and procedures was

¹²⁶ *ibid* art 3(2)(4).

¹²⁷ *ibid* art 21.

¹²⁸ *ibid* art 3(8) the governments may restrict the number of redeterminations permitted within the Unitization Agreement.

¹²⁹ *ibid* art 10(4).

¹³⁰ C Williams, ‘Venezuela gas from Loran-Manatee to be processed at Point Fortin LNG’ (25 November 2015) Oil & Gas J <<http://www.ogj.com/articles/2015/09/venezuela-gas-from-loran-manatee-to-be-processed-at-point-fortin-lng.html>> accessed 25 September 2015

¹³¹ T&T - Venezuela Framework Agreement arts 3(1)(b), 3(1)(c), 10(5)(2).

¹³² *ibid* art 10(5)(2).

¹³³ *ibid* art 9(2).

¹³⁴ *ibid* art 4.

¹³⁵ *ibid* art 8(2).

identified as one of the potential causes for the incident so this shows a positive step forward as does the direct involvement of the operators in health and safety issues. Adversely there is no accountability, as no requirement exists for these policies and procedures to be approved and neither is there any supervision procedure to ensure adherence to these regulations.

4.3.4. 2008 Iceland - Norway

The Framework Agreement between Iceland and Norway is a very basic treaty, which in the event of THRs governments are required to agree a mandatory Unitization Agreement.¹³⁶ There is very little attempt by the treaty to establish a comprehensive international legal framework. Overall the treaty tends to apply respective national laws in most cases.¹³⁷ For health, safety and environmental measures the treaty requires the parties to consult with each other, but only to ensure that the national laws of both parties are applied.¹³⁸ The treaty delegates minimum sovereignty. The treaty is absent on the creation of an inter-governmental body, which illustrates reluctance to delegate authorities.

The seminal allocation of THRs requires agreement of both governments¹³⁹ and the failure to agree allows the governments to appoint an independent expert to make a binding decision on the matter¹⁴⁰ although the governance procedures covering this process are unclear. A redetermination of this allocation however may be taken at any time based on substantial new geological information¹⁴¹ and neither government can withhold drilling permits required related to the determination of the allocation.¹⁴²

Any disagreement between the governments is delegated to a tribunal¹⁴³ or independent expert.¹⁴⁴ The body of the tribunal aims to be transparent by designating two arbitrators and a third independent and non-national chair selected by the designated arbitrators or, in the event they cannot agree, by the ICJ.

¹³⁶ Agreement between Iceland and Norway concerning Transboundary Hydrocarbon Deposits (entered into force 2008) text registered with the UN No. 50378 (Iceland – Norway Framework Agreement) art 1 “Neither Party can begin exploitation of any hydrocarbon deposit which extends to the continental shelf of the other Party until agreement on the exploitation of the deposit as a unit is reached between the Parties.”

¹³⁷ *ibid* arts 3(5), 3(8), 3(10).

¹³⁸ *ibid* art 3(10).

¹³⁹ *ibid* art 3(3).

¹⁴⁰ *ibid* art 6.

¹⁴¹ *ibid* art 7.

¹⁴² *ibid* art 3(8).

¹⁴³ *ibid* art 5.

¹⁴⁴ *ibid* art 6.

It is unclear whether the decisions of the tribunal will be made public and which stakeholders will be involved in the process. Conservation is governed by the obligation to execute a mandatory Unitization Agreement.¹⁴⁵ Health safety and environmental aspects are all referred back to municipal laws, although governments do agree to be transparent on the information they receive from inspecting facilities.¹⁴⁶ Unified health, safety and environmental procedures among the different operators are missing.

4.3.5. 2012 Norway - Russia

This framework agreement is very similar to the Iceland - Norway Framework Agreement which in the event of a THR simply mandates the governments to agree a Unitization Agreement.¹⁴⁷ The framework agreement makes no attempt to establish a comprehensive legal framework for THRs.¹⁴⁸ Unlike in the Iceland - Norway Framework Agreement it appears that the governments of this framework agreement wish to establish an inter-governmental body and delegate limited authority to a plenary organ. The treaty obliges the governments to establish a Joint Commission for inter-governmental consultations and resolving issues.¹⁴⁹ Whilst the creation of this Joint Commission is a positive step forward there is no mention of the scope of authority and powers of the commission. The role of the Joint Commission is further muddled since the framework agreement provides for a tribunal upon a failure of the governments to agree on a Unitization Agreement¹⁵⁰ and an independent expert to determine the allocation of reserves where governments do not reach consensus.

The reserve allocation is to form part of the unitization agreement which the governments are to approve.¹⁵¹ If the governments' cannot agree on this matter an independent expert is to be appointed to make a binding decision on the

¹⁴⁵ *ibid* arts 1, 2(3).

¹⁴⁶ *ibid* art 3(11).

¹⁴⁷ Treaty between the Kingdom of Norway and the Russian Federation concerning Maritime Delimitation and Cooperation in the Barents Sea and the Arctic Ocean (adopted 15 September 2010, entered into force 7 July 2011) text registered with the UN No. 49095 (Norway – Russia Framework Agreement) art 5(2) requires “...agreement on the exploitation of the hydrocarbon deposit as a unit, including its apportionment between the Parties, shall be reached at the request of one of the Parties...”

¹⁴⁸ *ibid* Annex II, art 1(7) provides THR drilling permits are subject to municipal law whilst art 1(10) requires the Parties to consult over applicable municipal law on health, safety and environmental matters.

¹⁴⁹ *ibid* Annex II, art 1.13.

¹⁵⁰ *ibid* Annex II, art 3.

¹⁵¹ *ibid* Annex II, art 1.3.

matter.¹⁵² There is no process established for the appointment or decision-making manner of the independent expert. Neither government should withhold drilling permits required for the determination of the THR and its allocation.¹⁵³ Any redetermination of the allocation requires an agreement of the parties¹⁵⁴ which would suggest there is no scope for the use of an independent expert in this instance.

The framework agreement wording is almost identical to the Iceland - Norway Framework Agreement. So once again a lack of good governance exists, as there is no certainty over the accountability, transparency and the application of the rule of law. Conservation governance principles beyond the Unitization Agreement are absent.

4.3.6. 2012 United States – Mexico

The Framework Agreement between the US and Mexico is the most recent framework agreement executed in 2012 and came into force in 2014. As the sixth framework agreement it had the advantage that it could apply lessons from the experiences of the others.

The framework agreement creates a Joint Commission to administer the agreement and establishes that each government shall appoint a representative and an alternative representative and may provide assistance from experts, as it deems necessary.¹⁵⁵ The composition of the Joint Commission fails to set requirements on the background of these representatives which means the seniority of the individuals is unknown as is whether they are expected to be technocrats or political figures. Further its representatives determine the procedures of the Joint Commission. There is no requirement for these procedures to be approved by each government creating potential poor transparency and accountability. It is unclear whether the decisions of the Joint Commission must be taken unanimously.

¹⁵² *ibid* Annex II, art 4(1).

¹⁵³ *ibid* Annex II, art 1.7.

¹⁵⁴ *ibid* Annex II, art 4(2).

¹⁵⁵ Agreement between the United States of America and the United Mexican States Concerning Transboundary Hydrocarbon Reservoirs in the Gulf of Mexico (adopted 20 February 2012, entered into force 18 July 2014) text registered with the UN No. 52496 (US – Mexico Framework Agreement) art 14(2).

Matters which can be referred to the Joint Commission are decisions concerning whether a THR exists,¹⁵⁶ the approval of a Unitization Agreement or an amendment to such,¹⁵⁷ the THR production allocation or revision¹⁵⁸ and a catch all bucket of disputes or matters referred to it by an Executive Agency.¹⁵⁹ The agreement accepts that a Joint Commission will not always have the required expertise to review a specific matter and therefore allows the Joint Commission to establish working groups and seek outside advice.¹⁶⁰ It is unclear how the Joint Commission involves stakeholders in its decision making process. The agreement fails to establish if the decisions of the Joint Commission are binding or not. For decisions relating to the Unitization Agreement and production allocation the Joint Commission is under no obligation to resolve a dispute as it may refer the matter back to the government who can then refer the matter to a dispute settlement procedure.¹⁶¹ As plenary powers are restricted, the agreement does not create an inter-governmental body with full authority. The Joint Commission role is left somewhat ambiguous and its procedures and accountability are not defined clearly. Some more clarity on the governance of the Joint Commission should exist once it publishes its procedures, assuming it does so since there is no obligation on the Joint Commission to do so.

The agreement establishes an Expert Determination procedure for technical matters. The Executive Agencies may refer to Expert Determination the issue of the Unit Operating Agreement where the licensees do not reach an agreement,¹⁶² the estimation of recoverable reserves and corresponding allocation where the Executive Agencies cannot achieve an agreement¹⁶³ and the allocation of reserves when the Joint Commission is unable to resolve differences.¹⁶⁴ Article 16 determines the Expert Determination procedure but leaves the Joint Commission to determine how an expert should be appointed. Some transparency principles do exist as the agreement requires each government to supply all the

¹⁵⁶ *ibid* art 5(2).

¹⁵⁷ *ibid* arts 6(4), 6(5), 7(4), 7(5).

¹⁵⁸ *ibid* arts 7(6), 8(3), 9(3).

¹⁵⁹ *ibid* art 14(5).

¹⁶⁰ *ibid* art 14(3).

¹⁶¹ *ibid* art 14(7).

¹⁶² *ibid* art 7(3).

¹⁶³ *ibid* art 7(3).

¹⁶⁴ *ibid* art 14(6).

information required by the expert¹⁶⁵ and requires the expert to be impartial and transparent.¹⁶⁶ There are also elements of accountability, as the expert must provide detailed reports to the Joint Commission¹⁶⁷ and Executive Agencies¹⁶⁸ and both governments are able to ask questions and make further suggestions.¹⁶⁹ However, the agreement fails to require the involvement of the Unit Operator in decisions related to the Unit Operating Agreement. Transparency in the Expert Determination procedure is particularly important since the decision of the independent expert is final and binding upon both governments.¹⁷⁰

The settlement dispute procedure established by the agreement follows the practice recommended by the UN Charter in that it requires the parties to attempt to resolve matters through consultation.¹⁷¹ Where that fails the choice of mediation or arbitration exists.¹⁷² The arbitration rules need to be established by the Joint Commission¹⁷³ and there is no mention whether decisions from the arbitration panel will be binding or not.

Overall even though the agreement makes significant steps towards establishing an inter-governmental body there are themes running throughout the agreement that suggest that the governments did not want to convey too much authority to the agreements overseeing bodies. The scope of authority of each overseeing institution is unclear with only the expert determination procedure providing binding decisions, all other decisions act as mere advice either to the respective Executive Agencies or governments.

Petroleum conservation provisions are sparse within the agreement. One of the first limitations is the extent of the geographic area to which the treaty applies. It is limited to within 3 statute miles of the delimitation line¹⁷⁴ compared to the 10 nm (11.5 statute miles) in the France - Canada Framework Agreement.¹⁷⁵ This limited geography creates the possibility that some THRs will not to be

¹⁶⁵ *ibid* art 16(3).

¹⁶⁶ *ibid* art 16(4).

¹⁶⁷ *ibid* art 16(5).

¹⁶⁸ *ibid* art 16(6).

¹⁶⁹ *ibid* art 16(5).

¹⁷⁰ *ibid* art 16(9).

¹⁷¹ *ibid* art 15(1).

¹⁷² *ibid* arts 15(2), 15(3).

¹⁷³ *ibid* art 17.

¹⁷⁴ *ibid* art 4. The delimitation line is effectively the maritime boundary.

¹⁷⁵ *ibid* art 4 of the explanatory statement.

covered by the agreement and will therefore not be developed through a Unitization Agreement.¹⁷⁶

The Agreement is complex and confusing with an unnecessary interwoven structure which at times makes it difficult to determine the agreements intent. A case in point is whether or not the agreement mandates the use of a unitization agreement. If the governments,¹⁷⁷ or Joint Commission in the case it is referred, ¹⁷⁸ agree that a THR exist the agreement states that “Any joint Exploration and/or Exploitation of a Transboundary Reservoir or Unit Area pursuant to the terms of a unitization agreement must be approved by the Parties.” ¹⁷⁹ A first reading suggests a unitization agreement is mandatory but the text is poorly drafted failing to stipulate all such activities are pursuant to a unitization agreement and it leaves open the question what does “joint” mean and what is the situation if the Exploration and/or Exploitation is not “joint.” Article 7 of the Agreement provides for what should occur in the event a unitization agreement is not agreed upon which is to facilitate the exploitation as a “Transboundary Unit”¹⁸⁰ but the Licensees can decide not to enter a unitization agreement and the governments will respond by requiring a Unit Operating Agreement¹⁸¹ and they will jointly determine the reserves on each side of the delimitation line and the associated production allocation.¹⁸² This makes the agreements wording scarily close to applying the law of capture although an Expert Determination procedure exists in the event of a disagreement.¹⁸³

Assuming a joint Exploration and/or Exploitation pursuant to a Unitization Agreement exists, the Unit Operator should submit the agreement including “the methodology used to calculate the allocation of production”¹⁸⁴ and

¹⁷⁶ Oil fields can cover vast areas, for example the world’s largest field is the Ghawar field in Saudi Arabia which covers 180 kilometers. R Lagoni, ‘Oil and Gas Deposits Across National Frontiers’ (1979) 73 AJIL 215, 217.

¹⁷⁷ US – Mexico Framework Agreement art 5(1) – the agreement refers to THRs as Transboundary Reservoirs.

¹⁷⁸ *ibid* art 5(2).

¹⁷⁹ *ibid* art 6(1).

¹⁸⁰ *ibid* art 2 “a single geological Hydrocarbon structure or Reservoir which extends across the Delimitation Line the entirety of which is located beyond 9 nautical miles from the coastline, approved by the Executive Agencies for joint Exploration and/or Exploitation pursuant to the terms of a unitization agreement.”

¹⁸¹ *ibid* defines a Unit Operating Agreement as “an agreement made between the Licensees and the unit operator that, among other things, establishes the rights and obligations of the Licensees and the unit operator including, but not limited to, the allocation of costs and liabilities incurred in and benefits derived from operations in the Unit Area” whilst the agreement distinguishes a unitization agreement differently without providing a definition but defining its contents in art 6(2).

¹⁸² *ibid* art 7(2)(b).

¹⁸³ *ibid* art 7(3).

¹⁸⁴ *ibid* art 6(2)(c) – the Agreement should, but does not, stipulate the unitization agreement must also include the resultant allocation.

procedures for a subsequent reallocation for both Governments approval.¹⁸⁵ Whilst both governments approve this methodology it appears the result of the calculations is open for discussion since the governments require a consultation on the allocation 60 days prior to the commencement of production¹⁸⁶ and if they do not reach an agreement the Joint Commission reviews the matter¹⁸⁷ with an independent expert being the final and binding decision maker if the Joint Commission is also unable to reach agreement.¹⁸⁸ Allocation redetermination is allowed pursuant to the terms of the unitization agreement or, where one does not exist, the governments jointly determine the reserves on each side of the delimitation line and the associated production allocation.¹⁸⁹ In the event a unitization agreement does not exist it is unclear what events and who may trigger a redetermination.

The Unitization Agreement requires a development plan outlining the number and timing of wells.¹⁹⁰ Whilst nothing is mentioned on the location of those wells it would be expected that an operator would locate the wells considering the reservoir geology so as to maximize production. Concerning safety and environmental provisions the agreement requires the Executive Agencies to develop a model Unitization Agreements which cover the safety and environmental plans of the licensees under the laws of both nations.¹⁹¹ Safety and environmental governance therefore depends upon these models. The agreement requires governments to provide access to facilities near the delimitation line.¹⁹² This shows a clear intent of the governments to minimize required investments and minimize environmental impact, two significant elements of petroleum conservation.

Chapter 6 of the Agreement is dedicated to inspections, safety and environmental protection. For inspections on health, safety and fiscal matters the Executive Agencies are required to develop specific procedures subject to the national laws of both governments.¹⁹³ Concerning safety and environmental

¹⁸⁵ *ibid* art 6(3) - the governments may refer this to the Joint Commission – art 6(4).

¹⁸⁶ *ibid* art 8(1).

¹⁸⁷ *ibid* art 8(3).

¹⁸⁸ *ibid* arts 14(6), 16(9).

¹⁸⁹ *ibid* arts 9(1), 7(2)(b).

¹⁹⁰ *ibid* art 6(2)(d).

¹⁹¹ *ibid* art 6(2)(j).

¹⁹² *ibid* art 12.

¹⁹³ *ibid* art 18(2).

protection the governments are required to adopt common standards¹⁹⁴ taking into account their international obligations with the responsibility of the Executive Agencies to develop implementation procedures.¹⁹⁵ Unfortunately this effectively takes the governance of safety and environmental matters back to central governments unless regulations return the responsibility to an overseeing institution established by the treaty, for example the Joint Commission.

4.4. Conclusions

Framework agreements have an inherent conflict in whilst they exist to provide a comprehensive legal framework for the development of THRs their content is rather limited to establishing general guidelines for the governments and other inter-governmental institutions to develop detailed procedures. Their focus has tended to be on establishing a framework for determining the procedures governments should follow in order to determine whether a THR exists and if so how to agree on a unitization agreement with the corresponding allocation of reserves between governments. It is here where the agreements incorporate the most provisions. Regrettably, other conservation principles such as sharing of existing facilities and well-spacing are loosely spread across the agreements.

Typically the agreements require some form of mandatory unitization although the early agreements provided governments a form of limiting this. Production allocation is a politically sensitive matter and is typically proposed by the unit operator for both governments approval although no guidance or procedure to determine this allocation is provided by any of the agreements. The governments aware that these negotiations may prove unfruitful all provide for the appointment of an independent expert who can make a binding decision on the matter. Whilst several of the agreements require governments to be advised of the methodology for calculating total reserves only the US - Mexico Framework Agreement stipulates unitization agreements should describe the methodology used to determine the allocation. Unlike in some domestic unitization legislation no guidelines are provided on what makes an equitable allocation.¹⁹⁶ Considerate

¹⁹⁴ *ibid* art 19(1).

¹⁹⁵ *ibid* art 19(2).

¹⁹⁶ Most US municipal legislation on allocation requires some form of "fair, reasonable, and equitable share of production" to be determined. Some legislation provides details of factors to be considered, for example North Dakota requires the "taking

of the fact the initial allocation will be based upon incomplete information each of the agreements offers a form to review the allocation as more information becomes available with some agreements requiring the application of the same procedure as initially used whilst others fail to establish the procedure. The agreements include up to five different bodies for decision-making. Firstly, the governments themselves are required to make many and dissimilar decisions under the agreements. This suggests governments are still somewhat reluctant to delegate authority on matters of sovereignty as the agreements fall short of establishing an inter-governmental body with full authority. Anxiety regarding a potential loss of sovereignty is evidenced across the agreements. Once governments feel themselves too constrained by the agreements, they seek to transplant the *modus operandi* to national laws.

Secondly a Joint Commission is set up of high-ranking government officials to take some of the more important decisions on matters such as approving unitizations agreements. These Commissions tend to be too distant to manage an appropriate day-to-day administration of the treaty. For disputes on technical matters, such as the extent of a THR and the allocation of the reserves, an independent expert is normally employed, often with authorization to make binding decisions. Finally, to resolve disagreements between the governments a tribunal or arbitration exists which typically provides a final and binding decision. The governance procedures established over these bodies varies in each agreement.

There are many instances where a framework agreement tends to discount key stakeholders such as the unit operator from providing valuable input into day-to-day decisions. Moreover framework agreements leave a void on public participation and engagement. Much of the governance procedures is built around

into account acreage, the quantity of oil and gas recoverable therefrom, location on structure, its probable productivity of oil and gas in the absence of unit operations, the burden of operation to which the tract will or is likely to be subjected, or so many of said factors, or such other pertinent determination.” Williams and Meyers identify 9 factors relevant for negotiating an allocation formula: (1) The drive mechanism available in the field; (2) Well productivity; (3) Well density; (4) Effect of proportioning; (5) Acre feet of productive formation; (6) Oil initially in place beneath a tract; (7) Extent and accuracy of information that has been obtained as a result of securing electrical logs, coring, testing; (8) The extent of penetration into the producing formation; and (9) The current allowable formula. H Williams and others, *Williams & Meyers Oil & Gas Law* (Abridged 4th edn, LexisNexis 2010) 245. Also see, for example, IOGCC Model Statute <http://iogcc.publishpath.com/Websites/iogcc/docs/iogcc_model_statute_and_fieldwide_unitization_references.pdf> accessed 17 December 2015

a top-down centralized control approach, evidencing significant flaws in transparency, participation, plurality, dialogue, and enhance accountability.¹⁹⁷

Unitization is a fundamental component of the framework agreements as the agreements seek to agree on unitization agreements to maximize field production whilst applying a health, safety and environmental framework and on some occasions incorporating the use of existing infrastructure to reduce economic costs and minimize environmental surface impact.¹⁹⁸ Within the agreements unitization is the strongest area of petroleum conservation governance typically providing various review procedures to evaluate the reservoir geological characteristics, efficient development, reserve volumes and allocation. Unfortunately, unitization provisions are not uniform and consistent across the framework agreements. Mandatory unitization is not contemplated in all of the framework agreements.¹⁹⁹ The agreements are silent in many key unitization provisions, such as location of wells, drilling regulations and secondary enhanced recovery methods. Governance over unitization provisions is left to the governments and in some matters to the inter-governmental bodies, such as the joint commission. Governments or a joint commission must approve the unitization agreement, however detail on the scope of the unitization agreement and its corresponding governance procedures is completely absent, except for the obligation to produce a mandatory model of unitization agreement under the United States - Mexico agreement for future discoveries of THRs within the area defined in the framework agreement.

On health, safety and environmental regulations the agreements tend to state that the governments will either coordinate to apply some form of common guidelines or they will apply national regulations. The common policy approach and institutional coordination among the different regulators is vaguely left for the governments to develop further policy, which creates uncertainties on whether this will ever happen. The approach of applying national laws presents possible conflicts of laws as infrastructure, equipment and peoples may cross national boundaries repeatedly. A suggested approach would be for the inter-governmental

¹⁹⁷ Ostrom polycentric and 'networked' approaches to respond to energy and climate dilemmas. E Ostrom, 'A polycentric Approach for Coping with Climate Change' (2009) Policy Research Working Paper 5095, The World Bank.

¹⁹⁸ This is the case for example in the UK-Norway and to a lesser extent in the T&T - Venezuela and US - Mexico Framework Agreements.

¹⁹⁹ Refer to Section 4.3. Petroleum Conservation Governance within Framework Agreements.

overseeing institutions, such as the joint commission to be given full responsibility and accountability to ensure harmonization and enforcement of seminal matters. An enforcement role under unified or common regulations and guidelines is essential for the supervision of operators in key health, safety and environmental provisions. This suggested approach of a joint overseeing institution has been developing widely under the law of international watercourses²⁰⁰ and transboundary aquifers.²⁰¹ Without a full delegation of authorities to one or several overseeing inter-governmental institutions uncertainties over what the precise rules are, who is responsible for overseeing them and how enforcement occurs will prevail.

Further, petroleum conservation governance within the Framework Agreements is completely absent in four fundamental matters today needed for the benefit of governments, individuals and society as a whole: (1) a holistic approach to nature, including its relation to other ecosystems, marine life and other regional and global ocean governance issues; (2) public participation, including participation of indigenous people such as fishing communities. This also includes the right to individual development and self-determination;²⁰² (3) climate regulations including CO2 reduction and capture and air pollution; and (4) energy efficiency and transition to cleaner forms of energy production.²⁰³

Having reviewed the framework agreements, it remains unclear how effective they are at governing petroleum conservation, particularly unitization. Little progress from previous joint development agreements is evidenced,

²⁰⁰ art 2 defines Regional Economic Integration Organization as “an organization constituted by sovereign States of a given region, to which its member States have transferred competence in respect of matters governed by this Convention and which has been duly authorized in accordance with its internal procedures, to sign, ratify, accept, approve or accede to it.” In addition art 8 determines that “States may consider the establishment of joint mechanisms or commissions, as deemed necessary by them, to facilitate cooperation on relevant measures and procedures in the light of experience gained through cooperation in existing joint mechanisms and commissions in various regions.” Finally regarding overall management art 24 states that “Watercourses States shall, at the request of any of them, enter into consultations concerning the management of an international watercourse, which may include the establishment of a joint management mechanism...” Management under such art refers to: “(a) Planning the sustainable development of an international watercourse and providing for the implementation of any plans adopted; (b) otherwise promoting the rational and optimal utilization, protection and control of the watercourse.” Watercourses Convention. J Bruhács, *The Law of non-navigational uses of International Watercourses* (M Zehery (tr), Martinus Nijhoff Publishers 1993) Ch 5.

²⁰¹ art 7 states that for the purpose of cooperation “aquifer States should establish joint mechanisms of cooperation.” Further, art 14 encourages States to “enter into consultations concerning the management of a transboundary aquifer or aquifer system” to establish when appropriate “a joint management mechanism...” Draft Articles on the Law of Transboundary Aquifers.

²⁰² Fundamental Human Rights are now part of both customary international law and general principles of law. Benvenisti (n 2) 184.

²⁰³ At the United Nations Sustainable Development Summit on 25 September 2015, world leaders adopted the 2030 Agenda for Sustainable Development A/Res/70/1, which includes a set of 17 Sustainable Development Goals to end poverty, fight inequality and injustice, and tackle climate change by 2030. The efficient management of shared natural resources is included under Goal 12: Responsible consumption and production. “To achieve sustainable development and a higher quality of life for all people, States should reduce and eliminate unsustainable patterns of production and consumption...”. Also see, for example, Principle 8 of the 1992 Rio Declaration on Environment and Development.

especially when surrendering full authority to an inter-governmental institution to oversee accountability, transparency and the rule of law. Governance procedures are far from providing consistent and uniform principles to promote petroleum conservation. Efforts to promote accountability, transparency, inclusion and participation remain an uphill struggle. The following implementation years of the framework agreements are crucial. Only once these rules and procedures have been fully established will have a clear idea on how effective framework agreements are at applying and strengthening petroleum conservation principles.

Chapter 5. How do Framework Agreements Incorporate Petroleum Conservation Principles of Environmental Assessment and Protection?

5.1. Introduction

The oil and gas industry has evolved based upon operations within artificial political boundaries. As mentioned in Chapter 2 “geologic structures containing gas and oil do not conform to property lines, licensing demarcations, or political boundaries”¹. Uncertainties on the role of sustainability and environmental protection continue to amount. As discussed, the concept of petroleum conservation requires the sustainable development of oil and gas reserves by maximizing reservoir production and minimizing project costs whilst applying best practice on social, health, safety and environmental matters. However, doing this where there is a potential conflicting law, guidelines and practice is extremely complex.

This Chapter focuses on petroleum conservation principles of assessing and minimizing environmental impact and their relevance to THRs. It briefly examines international environmental laws and guidelines applicable to the oil and gas sector. An approach to environmental guidelines, practice and soft law is briefly reviewed before examining the international environmental law applicable to offshore oil and gas operations. Having reviewed the context on environmental law this Chapter then reviews if and how current framework agreements have incorporated this framework, before concluding on whether the environmental provisions within framework agreements promote petroleum conservation principles.

5.2. What is Petroleum Conservation Relevance to THRs?

As discussed in the previous Chapters, the term petroleum conservation is frequently associated to sustainability. Today petroleum conservation includes a holistic approach to nature and requires oil and gas activity, whether at a

¹ A Utton, ‘Institutional Arrangements for Developing North Sea Oil and Gas’ (1968-1969) 9 VJIL 66, 70.

municipal or international level, to include an assessment of the environment, whilst applying best practice on social, health and safety matters.² It is nowadays undisputable that oil and gas activities have social, health, safety and environmental dimensions which affect the public interest at large.

As discussed in the previous Chapter, recent incidents such as the Macondo blowout have raised awareness not only for good governance issues, but also on the potential negative transnational environmental implications of offshore oil and gas activities. As exploration increasingly focuses on highly sensitive environments such as the Arctic Ocean and the Caribbean Sea, it is of critical importance that framework agreements apply best practices. As petroleum conservation incorporates more and more principles of sustainable development, clear rules to oversight provisions on health, safety and environmental matters are nowadays paramount. As a minimum, international agreements governing THRs must now seek to incorporate the highest standards. With this in mind this Chapter will now review the environmental provisions applicable to THRs in recent framework agreements.

5.3. What Environmental Law is Applicable to Framework Agreements?

A combination of municipal, international and soft law and industry guidelines and practice provides the legal framework governing health, safety and environmental matters of oil and gas upstream operations. Both current framework agreements and treaties on international maritime law provide some guidance on offshore oil and gas environmental law. The development of these treaties has been driven by maritime pollution concerns³ and so their focus tends to be narrow. However, as Low positions “international environmental law has evolved to include broader, more holistic concerns such as conservation and protection of biodiversity”⁴ and so it is important to understand some of the guiding principles of environmental law which should be applied to framework agreements. This section will first

² For example ICZM aims to establish plans to maximize the benefits of the coast by taking a holistic view of all sector activities whilst minimizing harmful impacts upon the environment.

³ R Warner, *The Oceans Beyond National Jurisdiction* (Martinus Nijhoff 2009) 68-70.

⁴ C Low, ‘Marine Environmental Protection in Joint Development Agreements’ (2012) 30 JERL 45, 49. The basis for Low’s assertion is the Convention on Biodiversity which will be reviewed later in this chapter.

review some of these guiding principles and industry guidelines and practice before reviewing applicable international environmental law to offshore activities.

5.4. Generally Applicable Environmental Law

One of the first instances of the broadening of environmental law can be seen in the 1972 World Heritage Convention which obliges a State to “do all it can” to protect and conserve cultural heritage and areas of outstanding natural beauty situated on its territory.⁵ Every State has the responsibility not to deliberately damage a World Heritage Site whether or not it is on their territory.⁶ Whilst the conventions applicability is limited to specific areas Wiggins argues that the wording of the treaty is sufficiently wide to even require States to do all they can on emissions.⁷

The 1992 CBD founded many holistic principles of environmental law by setting a broad objective of the “conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.”⁸ This partially created the principle of sustainable development which Low considers has shaped environmental law in the last 10-20 years.⁹ Evidence of this can be seen in the 1997 Watercourses Convention which requires the use of international watercourses to consider “optimal and sustainable utilization” for present and future generations.¹⁰ The 1992 Rio Declaration provides further evidence establishing that “to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be

⁵ Convention concerning the Protection of the World Cultural and Natural Heritage (adopted 16 November 1972, entered into force 17 December 1975) 1037 UNTS 151 (The World Heritage Convention) art 1. Whilst the author knows of no World Heritage sites where the provisions of this convention presently apply to oil and gas operations it could be imagined it would apply for discoveries in areas where there are historical ruins or offshore barrier reefs. For example areas such as the Sian Ka'an biosphere reserve on the east coast of the Yucatán peninsula in Mexico and reefs such as the Great Barrier Reef in Australia, the Tubbataha Reef Marine Park in the Philippines and the Belize Barrier Reef Reserve System which are all considered World Heritage Sites.

⁶ *ibid* art 6.

⁷ L Wiggins, 'Existing Legal Mechanisms to Address Oceanic Impacts From Climate Change' (2006-2007) 7 SDLP 22, 23. The convention establishes an Intergovernmental Committee called "the World Heritage Committee" to develop the procedures for the convention however there is no mention within the treaty whether it should also play a role in enforcing the treaty.

⁸ CBD art 1.

⁹ Low, 'Marine Environmental Protection' (n 4) 49.

¹⁰ Watercourses Convention art 5.

considered in isolation from it.”¹¹ The CBD also establishes the need to conserve biological diversity and defines this broadly to cover the entire ecosystem.¹² Furthering the holistic principle the CBD requires States to develop strategies for the “conservation and sustainable use of biological diversity” and promote the protection of ecosystems and natural habitats.¹³ In theory this requires States to develop national biodiversity strategies covering all life forms but governments are not always adhering.¹⁴ Like the World Heritage Convention the CBD respects sovereignty and its obligations apply within a State.¹⁵ Of particular relevance to oil and gas operations the convention requires States to identify and regulate activities likely to adversely affect biodiversity significantly¹⁶ and introduce appropriate procedures requiring environmental impact assessment.¹⁷

It has been suggested this holistic environmental approach be applied to the Arctic¹⁸ and it has been applied to international waters under the Watercourses Convention,¹⁹ requiring States to use an “international watercourse in an equitable and reasonable manner.”²⁰ Relevant factors and circumstances to consider in determining this are defined widely to cover geographic and other natural factors, social and economic needs, population dependent on the watercourse, existing and potential watercourse uses, conservation, protection and development of the economies on the watercourse and the availability of alternatives. States should consider all relevant factors together and reach a conclusion “on the basis of the whole.”²¹ Oil and gas, like water, are natural resources that have a migratory nature and therefore, a holistic approach taken to

¹¹ Principle 4.

¹² art 2 – “Biological Diversity” means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems.

¹³ *ibid* arts 6, 8.

¹⁴ For example, bacteria, fungi and protists are not mentioned in the Fifth report of the EU to CBD (June 2014) <<https://www.cbd.int/doc/world/eur/eur-nr-05-en.pdf>> accessed 10 November 2015

¹⁵ CDB arts 3, 4.

¹⁶ *ibid* arts 7(c), 8(d), 9(d).

¹⁷ *ibid* art 14(a).

¹⁸ E Gladun, ‘Environmental Protection Of The Arctic Region: Effective Mechanisms Of Legal Regulation’ (2015) 3 RJL 92; K Isted, ‘Sovereignty In The Arctic: An Analysis Of Territorial Disputes & Environmental Policy Considerations’ (2008-2009) 18 J Transnatl L & Pol’y 343, 371.

¹⁹ art 5.

²⁰ *ibid*.

²¹ *ibid* art 6. Resolution on Confined Transboundary Groundwater, ILC 46th session (1994) II Part II YILC (1994) recognizes that the draft articles on international watercourses also cover “groundwater which is related to an international watercourse.”

water must also be applied to oil and gas. Regarding offshore exploration and production Salter considers “environmental issues are increasingly being approached holistically and that this appears to be a reflection of an increased concern over environmental impacts and a fortification of the offshore environmental regulatory regime”.²² On an individually basis oil companies are also starting to approach environmental issues holistically, good examples can be seen from guidelines emitted by the E&P Forum²³ and Shells introduction of a holistic EA method called the “Environmental Case” in 1996.²⁴

5.5. Holistic Environmental Assessment (HEA)

Salter considers applying a HEA to offshore oil and gas operations. HEA considers that the environment is “a complete system where interactions are complex, numerous and at times unpredictable” and requires a holistic approach rather than focusing upon individual isolated ecosystems.²⁵ HEA aims to define a link between environmental burdens and the cost and/or benefit of the activity to industry and society. It looks to qualify, quantify and prioritize environmental impacts at each stage of a process with the environmental impacts being categorized as direct, secondary, indirect or cumulative impacts.²⁶ One of the objectives of this approach is to define an optimum environmental impact mitigation plan.

Regulatory movements towards the HEA principles are currently disjointed but are becoming prevalent. The International Organization for Standardization has produced ISO 14040 which establishes the principles and framework for LCA. Salter describes LCA as “a holistic, cradle-to-grave technique of analyzing the environmental loadings of a product, process or activity over its entire life cycle.”²⁷ The ISO admits LCAs have shortcomings as they are “at an early

²² E Salter and J Ford, ‘Holistic Environmental Assessment and Offshore Oil Field Exploration and Production’ (2001) 42 (1) Mar Pollut Bull 45-58, 45.

²³ Environmental management in oil and gas exploration and production: An overview of issues and management approaches, Joint E&P Forum/ UNEP Technical Publication, E&P Forum Report 2.72/254 (1997) 22 <<http://www.ogp.org.uk/pubs/254.pdf>> accessed 20 November 2015

²⁴ Salter and Ford (n 38) 56.

²⁵ *ibid* 48.

²⁶ *ibid* 47.

²⁷ *ibid* 49.

stage of development”²⁸ and Salter considers LCAs failures include the lack of a non-interdisciplinary approach and failure to incorporate accidental emissions.²⁹ Another HEA element is project CBA which provides an estimated social value to each element of a project impacting the environment.

One of the most important elements of a HEA is the SEA which “extends the application of EIA from projects to policies, programs, and plans.”³⁰ A “growing need to create new ways of effectively supporting progress towards reducing the rising rate of poverty, food crises, and the impact of climate change, social, economic and environmental impact of the oil and gas activities”³¹ requires more strategic interventions and the SEAs provide a tool to do this and also support the CBD requirement to develop strategies for conserving biodiversity.³² Whilst EIA’s focus on a particular project a SEA takes an integrated regional approach and can be seen as an initial step to develop a holistic environmental strategy and to maximize value prior to taking any decisions on any activity.³³

The use of HEA is growing in national legislation. Salter evidences this by referring to the growth of environmental legislation affecting the UK offshore oil and gas industry such that it “covers emissions to all media, air, water and land.”³⁴ Other evidence is the use of SEAs for oil and gas activities, both onshore and offshore, in Ghana, Mauritania, Bolivia, Uganda, Brazil and the UK.³⁵ The 2013 UK SEA for “Further Onshore Oil and Gas Licensing” conducted a LCA from exploration activities through decommissioning and site restoration and evaluates a holistic

²⁸ ISO 14040:1997 Environmental Management – Life Cycle Assessment – Principles and Frameworks revised by ISO 14040:2006 <<http://web.stanford.edu/class/cee214/Readings/ISOLCA.pdf>> accessed 20 November 2015

²⁹ Salter and Ford (n 22) 49.

³⁰ K Ahmed and E Sánchez-Triana (eds), *Strategic Environmental Assessment for Policies, An instrument for Good Governance* (The World bank Publications, 2008)

<http://siteresources.worldbank.org/INTRANETENVIRONMENT/17057721210788188539/21819527/SEA_FOR_POLICIE_S.pdf> accessed 10 September 2015

³¹ A Foluke, ‘Strategic Environmental Assessment (Sea) For Oil And Gas Development Plans’ (June 2012) Netherlands Commission for Environmental Assessment

<http://www.commissiener.nl/docs/mer/diversen/foluke_finalassignment2.pdf> accessed 15 October 2015

³² art 6.

³³ The approach to conducting a SEA varies. The “impact based SEA” is a systematic approach which predicts potential effects of policies, programs, and plans on the environment and enacts corresponding protection and mitigation measures. The approach has a five stage methodology: (1) screening to determine the need of the SEA; (2) scoping to determine the impacts which the SEA should evaluate; (3) the identification, prediction and evaluation of these impacts; (4) identifying and implementing mitigation measures; and (5) monitoring. The alternative approach is the “institution-centered SEA” where high level policy makers need to detect environmental risks and manage them then there are the approaches that combine elements of both approaches. Ahmed and Sánchez-Triana (n 30).

³⁴ *ibid* 51.

³⁵ The EU has also implemented the SEA Directive for member states to enact. *ibid* 3.

range of environmental impacts throughout the lifecycle of oil and gas activity.³⁶ Public consultation with government agencies and environmental NGOs was a key feature to improve accountability of the UK SEA³⁷ and the results helped determine UK policy on unconventional oil and gas exploration and fracking.

Canadian petroleum conservation legislation permits the government to adjust well spacing, target area, and setback requirements to take into account regional development and policies to maximize total recovery of petroleum.³⁸ Locating oil and gas facilities to minimize environmental impacts and maximize production by contemplating a reservoirs geological property is central to petroleum conservation and something a SEA should consider. ICZM provides best practice on determining permitted activities and their locations within a coastal region based upon the concept of coastal environment sustainability. It is defined as the governance process of the “legal and institutional framework necessary to ensure that development and management plans for coastal zones are integrated with environmental (including social) goals and are made with the participation of those affected.”³⁹ ICZM aims to establish plans to maximize the benefits of the coast⁴⁰ by taking a holistic view of all sector activities whilst minimizing harmful impacts upon the environment. Barker argues that SEAs can “greatly improve the degree of integration available within Integrated Coastal Zone Management.”⁴¹

Sectors typically considered by an ICZM include fisheries, oil and gas exploration, shipping, ports, tourism and recreation. It has been argued that ICZM and MSP principles can be implicitly read into UNCLOS which requires States to apply “best practicable” means at their disposal to prevent, reduce and control

³⁶ The ten environmental matters are categorized as Biodiversity & Nature Conservation, Population including demographics, socio-economics, Health, Land Use, Geology & Soils, Water & Flood Risk, Air Quality, Climate Change, Waste & Resource Use, Cultural Heritage including architectural and archaeological heritage and Landscape. Strategic Environmental Assessment for Further Onshore Oil and Gas Licensing, DECC (December 2013) AMEC Environmental & Infrastructure UK Limited Doc Reg No. 33917rr007i3

<https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/273997/DECC_SEA_Environmental_Report.pdf> accessed 23 November 2015

³⁷ art 25 of the ICCPR declared it a right to participate in “in the conduct of public affairs.” This right is embedded in most constitutions and recognized as a human right and a *sien quanon* condition for development.

³⁸ C Low, ‘The Rule of Capture: Its Current Status and Some Issues to Consider’ (2008-2009) 46 *Alta L Rev* 799, 818.

³⁹ J Post, C Lundin and the World Bank, *Guidelines for integrated coastal zone management* (1996 The World Bank) 1 <http://www.reefresilience.org/pdf/Post_Lundin_1996.pdf> accessed 5 November 2015

⁴⁰ The definition of coastal area is imprecise whilst some authors contend it covers from the watershed to the sea. *ibid* 3.

⁴¹ A Barker, ‘Strategic environmental assessment (SEA) as a tool for integration within coastal planning’ (2006) 22 (4) *JCR* 946, 950.

pollution of the marine environment⁴² and also as its preamble states that “the problems of ocean space are closely interrelated and need to be considered as a whole.” The 1992 United Nations Conference on Environment and Development in Rio de Janeiro adopted the ICZM system⁴³ but failed to mention whether this incorporated a MSP. It may be argued that the concept is implicitly supported, as a methodology of best practice for the protection and preservation of a marine environment exists within an ICZM framework.

MSP has been described as “a strategic plan (including forward-looking and proactive) for regulating, managing and protecting the marine environment, including through allocation of space, that addresses the multiple, cumulative and potentially conflicting uses of the sea and thereby facilitates sustainable development.”⁴⁴ The strategic nature of MSPs supports the CBD principle of developing national strategies for conservation and sustainable use of the environment⁴⁵ and increasingly countries are adopting MSP provisions into their municipal legislation.⁴⁶ OSPAR⁴⁷ is an example which aims to develop a MSP for the whole of the North Sea and applies not only to the EEZ but also the High Seas and has fifteen participating governments. OSPAR has six strategies of which the most relevant to the oil and gas sector are the “Offshore Oil and Gas Industry Strategy” and the “Strategy on the Protection and Conservation of the Ecosystems and Biological Diversity of the Maritime Area.” Within these the exploration for oil and gas and the “placement of structures, cables and pipelines for oil and gas

⁴² N Oral, ‘Integrated Coastal Zone Management And Marine Spatial Planning Hydrocarbon Activities In The Black Sea’ (2008) IJCLM 453, 460.

⁴³ Agenda 21 ‘Report Of The United Nations Conference On Environment And Development’ UN Doc a/Conf.151/26 vol 1 (1992) Ch 17 <http://www.un.org/Depts/los/consultative_process/documents/A21-Ch17.htm> accessed 9 September 2015

⁴⁴ S Boyes and others, ‘A proposed multiple-use zoning scheme for the Irish Sea. An interpretation of current legislation through the use of GIS-based zoning approaches and effectiveness for the protection of nature conservation interests’ (2007) 31 Mar Pol’y 287-298 in Oral (n 42).

⁴⁵ art 6.

⁴⁶ By their very nature ICZM and MSP are applicable in transboundary situations since activities concerning fishing, oil and gas operations, recreation and shipping have transboundary implications, especially concerning potential environmental impacts. There are MSP provisions in the Great Barrier Reef Marine Park in Australia, the Florida Keys National Marine Sanctuary in the United States, the Eastern Scotian Shelf Management Initiative in Canada, the Provincial Resource Management Plan in the Philippines and many places in Europe. Oral (n 42) 465.

⁴⁷ In 1992 the Oslo Commission established the OSPAR system by adopting the OSPAR Convention and establishing the OSPAR Commission to administer it. The governments of Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom and the EU form parties to the agreement which aims to protect the marine environment of the North-East Atlantic. OSPAR Commission: Protecting and Conserving the North East Atlantic and its resources <<http://www.ospar.org/>> accessed 5 September 2015

exploration and exploitation”⁴⁸ are identified as areas for MSP assessment. A further example of an MSP affecting oil and gas infrastructure location is the Shetland Islands’ MSP. This establishes that permits for oil and gas exploration and extraction require that an offshore facility and all associated infrastructure including pipelines comply with MSP policies and that there exists an emergency response plan together with monitoring and maintenance programs.⁴⁹ The MSP policies apply relevant petroleum conservation principles and require an offshore operator to review all co-existence options “to maximize the efficient use of the marine space” including discussions with “any adjacent marine user.”⁵⁰

5.6. Environmental Impact Assessment Standards

The obligation for oil and gas projects to perform an EIA when they may impact the marine environment beyond a national jurisdiction has customary international law status⁵¹ and is a requirement of the Espoo Convention.⁵² The ICJ has also ruled that EIAs can be considered a general requirement under international law where there is a risk of significant adverse impacts from a proposed activity in a transboundary context.⁵³

The aim of an EIA is to identify possible environmental and social impacts that could arise from a project and to establish an environmental management and implementation mitigation plan.⁵⁴ The EIA is a requirement of the CBD and an implied requirement of UNCLOS since countries must assess the potential effects of activities on marine life and maintain under surveillance activities which are likely to produce marine pollution.⁵⁵ No definition of an EIA is given by either UNCLOS or the CBD and the content of an EIA depends upon municipal law. At an

⁴⁸ Oral (n 42) 465.

⁴⁹ C Kelly, ‘Shetland Islands Marine Spatial Plan’ (2014) NAFC Marine Centre, University of the Highlands and Islands <http://www.nafc.uhi.ac.uk/departments/marine-science-and-technology/strategy/copy_of_SIMSP_2015.pdf> accessed 1 October 2015

⁵⁰ *ibid* 119.

⁵¹ Warner (n 3) 481.

⁵² art 2 and Appendix I art 15 state that the Convention applies to offshore hydrocarbon activities and art 8 states the Convention applies to large diameter oil and gas pipelines.

⁵³ C Payne, ‘Pulp Mills on the River Uruguay: The International Court of Justice Recognizes Environmental Impact Assessment as a Duty under International Law’ (2010) 14 (9) ASIL Insights <<https://www.asil.org/insights/volume/14/issue/9/pulp-mills-river-uruguay-international-court-justice-recognizes>> accessed 3 November 2015

⁵⁴ The mitigation plan is often referred to as the project EMPs.

⁵⁵ arts 204, 205, 206 of UNCLOS.

international level a “more uniform approach could be developed among relevant bodies for advanced environmental assessment of activities.”⁵⁶ The Espoo Convention provides EIA content requirements but they are too general to provide specific guidance to the oil and gas industry.⁵⁷

A joint work of the E&P Forum and UNEP provides a set of industry guidelines on environmental management and details typical EIA requirements to include: identifying legislation; describing environmental baseline; identifying sensitive environments; incorporating risk assessment; identifying project effects; quantifying impacts; evaluating alternatives; selecting BPEO; investigating mitigation; evaluating residual impact; establishing basis for standards, targets and operational procedures and other plans; developing basis for contingency planning; recommending management plan (consultation, monitoring, review and audit); and recommending basis for documentation and training.⁵⁸ The World Bank Environmental, Health, and Safety Guidelines provide an outline of what areas associated to oil and gas projects should be contemplated within an EIA,⁵⁹ but unfortunately they are general in nature.

An important concept raised by the E&P Forum and UNEP is the need for constant monitoring review and audit of environmental impacts throughout the lifecycle of upstream activities.⁶⁰ This is a widely accepted requirement in municipal, international and soft law and the CBD requires monitoring of the biological diversity.⁶¹ UNCLOS establishes the legal requirement to “observe, measure, evaluate and analyze ... the risks or effects of pollution of the marine environment”⁶² in offshore operations and MARPOL 73/78⁶³ creates further

⁵⁶ K Lee, ‘The International Legal Regime Of The High Seas And The Seabed Beyond The Limits Of National Jurisdiction And Options For Cooperation For The Establishment Of Marine Protected Areas (MPAS) In Marine Areas Beyond The Limits Of National Jurisdiction, Secretariat of the Convention on Biological Diversity’ (2005) CBD Technical Series No. 19, 14.

⁵⁷ Appendix II identifies 9 content areas for an EIA.

⁵⁸ Environmental Management in Oil and Gas Exploration and Production Guidelines: An Overview of Issues and Management Approaches, Joint E&P Forum/UNEP Technical Publication, E&P Forum Report 2.72/254 (1997) (Environmental Management in Oil and Gas Exploration and Production Guidelines) 32.

⁵⁹ These identify Air emissions, Wastewater / effluent discharges, Solid and liquid waste management, Noise generation, Terrestrial impacts and project footprint, Spills, Energy efficiency and Resource conservation as areas for review. Environmental, Health, and Safety Guidelines for Onshore Oil and Gas Development, World Bank Group (30 April 2007) <<http://www.ifc.org/wps/wcm/connect/4504dd0048855253ab44fb6a6515bb18/Final%2B%2BOnshore%2BOil%2BAnd%2BGas%2BDevelopment.pdf?MOD=AJPERES&id=1323153172270>> accessed 16 October 2015

⁶⁰ Environmental Management in Oil and Gas Exploration and Production Guidelines 26.

⁶¹ art 7.

⁶² art 204.

obligations regarding the monitoring and reporting of a pollution incident. Included within the methodology of conducting a SEA is the need for monitoring⁶⁴, as this also forms a vital part of a MSP as evidenced in the Shetlands MSP.⁶⁵

5.7. Soft Law Concepts

Industry is being held “increasingly accountable for its operations through soft law concepts such as the precautionary principle, polluter pays and producer responsibility.”⁶⁶ The precautionary principle considers that environmental harm should be foreseen and prevented whether there is conclusive scientific evidence or not. Whilst the principle is commonly accepted it lacks a common definition and at times may also be referred to as the precautionary approach.⁶⁷ This has resulted in various interpretations but the most commonly applied is from the Rio Declaration which states that “in order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost effective measures to prevent environmental degradation.”⁶⁸ There is no doubt that the historical prescriptive approach to environmental laws has been altered to apply a more holistic approach to nature. This is clearly evidenced in the EU Environmental Quality Objectives which have adopted the concept of IPC, and which endorses precautionary and sustainability concepts.”⁶⁹ The application of the precautionary principle to the oil and gas sector can also be seen through the Climate Change Convention, the subsequent Kyoto Protocol in 1997, and the recent Paris Agreement aim to reduce greenhouse gas emissions to protect the

⁶³ International Convention for the Prevention of Pollution from Ships (adopted 2 November 1973, entered into force 10 February 1983) 1340 UNTS 184 (MARPOL 73/78) art 6.

⁶⁴ Ahmed and Sánchez-Triana (n 30)

<http://siteresources.worldbank.org/INTRANETENVIRONMENT/1705772-1210788188539/21819527/SEA_FOR_POLICIES.pdf> accessed 10 September 2015

⁶⁵ Kelly (n 49).

⁶⁶ Salter and Ford (n 22) 45.

⁶⁷ At times it is unclear whether the two terms are intended to refer to the same concept. D Kazhdan, ‘Precautionary Pulp: Pulp Mills and the Evolving Dispute between International Tribunals over the Reach of the Precautionary Principle’ (2011) 38 (2) ELQ 527, 531.

⁶⁸ Rio Declaration Principle 15.

⁶⁹ Environmental Management in Oil and Gas Exploration and Production Guidelines 23.

ozone layer.⁷⁰ Environmental claims are notoriously difficult to prove and when invoking the precautionary principle some tribunals have called for a lower standard of proof for environmental harm.⁷¹ In *Pulp Mills on the River Uruguay (Argentina v Uruguay)*⁷² Argentina argued that the precautionary principle transferred the burden of proof to Uruguay and required Uruguay to prove the construction of a pulp mill would not create environmental damage. The ICJ rejected Argentina's request to transfer the burden of proof⁷³ which for some scholars have affected the scope of the precautionary principle.

The PPP is an economic principle which has become a general principle of international environmental law. The OECD first adopted the principle in 1972 and now considers that the principle has extended from a principle of partial internalization to one of full internalization⁷⁴ whereby the polluter is now responsible for all pollution costs associated to their actions. The polluter pays principle was reaffirmed by Principle 16 of the Rio Declaration and reads that "national authorities should endeavor to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment." The concept of Extended Producer Responsibility is an extension of the polluter pays principle which extends producer "responsibility for the environmental impacts of its product even after the product is sold."⁷⁵ The principle considers the environmental costs associated to the entire lifecycle of a product including its waste disposal. The principle was first applied in 1991 by Germany in the "Ordinance on Avoidance of Packaging Waste"⁷⁶ but since then

⁷⁰ This convention, the subsequent protocol and the recent Paris Agreement are largely responsible for the reduction of flaring at upstream oil and gas operations.

⁷¹ ITLOS is a tribunal created under UNCLOS which has treated the precautionary principle as customary international law. ITLOS has lowered standards of proof and potentially even shifted the burden of proof." Kazhdan (n 67) 533.

⁷² *Pulp Mills on the River Uruguay (Argentina v. Uruguay)* Judgment (20 April 2010) ICJ Reports 2010 <<http://www.icj-cij.org/docket/files/135/15877.pdf>> accessed 28 October 2015

⁷³ Kazhdan (n 67) 534.

⁷⁴ The economic definition of internalization requires a polluter to take responsibility for costs which would otherwise be borne by another external party. The PPP Analyses And Recommendations, OECD Environment Directorate (1992) OCDE/GD(92) 81

<[http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=OCDE/GD\(92\)81&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=OCDE/GD(92)81&docLanguage=En)> accessed 3 August 2015

⁷⁵ J Salzman, 'Sustainable Consumption and the Law' (1997) 27 *Envtl L* 1243, 1270.

⁷⁶ *ibid* 1270.

numerous countries have adopted the principle.⁷⁷ To oil companies the potential ramifications are huge; private enterprises could be responsible for environmental damages resulting from the production, transportation, refining, distribution and final consumption of hydrocarbons.

5.7.1. Industry Guidelines

There are multiple industrial associations which provide guidelines to their members. These guidelines are frequently self-regulated due to the complexities and costs of monitoring compliance in the remote locations where oil and gas exploration frequently occurs. Whilst many of the guidelines have a regional focus such as those of the API⁷⁸ and ARPEL⁷⁹ others such as those developed by the E&P Forum⁸⁰ aim to provide a global focus. The E&P Forum suggest environmental protection should be part of a company culture forming part of a company strategy and be reflected in the company organization, in its resource allocation and choice of sub-contractors.⁸¹ The E&P Forum has also identified areas they consider environmental plans should be conducted and required training, monitoring, review and audit.⁸² The breadth of such guidelines stretches across all activities in the sector covering every aspect of management, planning and operational activities and provides a wealth of information for framework agreements to incorporate.

⁷⁷ Including France, Belgium, Sweden, Austria, Japan and Canada. *ibid* 1274 -1275.

⁷⁸ API members pledge to follow a series of environmental principles and produce a series of guidelines which cover environmental practice including Recommended Practice 75. Environmental Principles, API Guidelines: An overview of issues and management applications. Recommended Practice 75 Development of a SEMP for Offshore Operations and Facilities RP75 (2004) <<http://www.americanpetroleuminstitute.com/Environment-Health-and-Safety/Environmental-Principles>> accessed 21 November 2015

⁷⁹ ARPEL is an industry body representing oil and gas companies in Latin America and the Caribbean.

⁸⁰ Environmental Management in Oil and Gas Exploration and Production <<http://www.ogp.org.uk/pubs/254.pdf>> accessed 20 November 2015

⁸¹ *ibid* 37.

⁸² "Pollution Prevention (UNEP Industry and Environment Centre —Cleaner Production); Waste Treatment and Disposal Techniques; Contingency Planning; Decommissioning, Rehabilitation and Aftercare; and Environmentally Sensitive Areas." *ibid* 38.

5.8. What International Environmental Law is Applicable to Offshore Petroleum Activities?

UNCLOS is commonly regarded as the primary source of international law for the protection of the marine environment.⁸³ It establishes the basic rights and obligations of Coastal States with regards the seabed, ocean floor and subsoil and the different ocean areas. As discussed in Chapter 3 the territorial sea area is defined as “up to a limit not exceeding 12 nautical miles”⁸⁴ from the coast and is the countries sovereign territory.⁸⁵ The Contiguous Zone is an area where a country has partial sovereignty and it may exercise control to prevent and punish “infringement of its customs, fiscal, immigration or sanitary laws and regulations” within its territory and extends to 24 nautical miles from the coast.⁸⁶ The EEZ is an area beyond and adjacent to the territorial sea up to 200 nautical miles.⁸⁷ In an EEZ the Coastal State has sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources and has jurisdiction to establish installations and structures and protect and preserve the marine environment⁸⁸ which effectively gives a State jurisdiction over offshore oil and gas operations on their EEZ. The Continental Shelf is between 200 and 350 nautical miles from the coast with the outer edge of the continental margin determining the precise distance should it fall within this range⁸⁹. On the Continental Shelf the Coastal State is granted “the sovereign rights for the purpose of exploring it and exploiting its natural resources”⁹⁰ and hence national laws apply. The area beyond the EEZ is referred to as the High Sea⁹¹ and may incorporate part of the Continental Shelf depending where the continental margin lies. Whilst these definitions create a useful guide on the rights of States to explore and exploit natural resources they also create grounds of conflict as exploitation of natural

⁸³ Low, ‘Marine Environmental Protection’ (n 4) 50.

⁸⁴ UNCLOS art 3.

⁸⁵ *ibid* art 2(1).

⁸⁶ *ibid* art 33.

⁸⁷ *ibid* art 55, 57.

⁸⁸ *ibid* art 56.

⁸⁹ *ibid* art 76.

⁹⁰ Defines natural resources as “the mineral and other non-living resources of the seabed and subsoil together with living organisms.” *ibid* art 77.

⁹¹ *ibid* art 86.

resources may overlap international boundaries.⁹² This section will now review international environmental law and its applicability to the oil and gas sector in each area of the marine environment.

5.8.1. Legal Regime Applying to Shipping

The IMO is the UN agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships. Formed by the 1948 Convention on the IMO⁹³ its ambit is to regulate international shipping on safety, security and environmental matters. Whilst the purpose of this Chapter is not to go into detail on the rules governing shipping the main rules applicable to oil tankers are worth a brief mention.

The IMO International Convention for the Prevention of Pollution from Ships, commonly known as MARPOL 73/78, is the prime piece of legislation governing shipping. Introduced in 1973 and updated in 1978 MARPOL aims to prevent and minimize shipping pollution and regulates ships operational discharges and spillages. It provides design parameters for ships and provides ports inspection rights so that the flag states⁹⁴ can certify that ships are compliant with the regulations. The regulations also establish pollution controls. Over time the regulations have been adapted to incorporate further controls such as the “Regulations for the Prevention of Air Pollution from Ships”⁹⁵ which establishes controls on Sulphur Oxide emissions in Emission Control Areas. The constant adaptation and development of MARPOL⁹⁶ creates a limitation on the ability for it to be enforced since Article 14 gives each State the authority to choose whether or not to accept amendments to the convention. Additional enforcement problems exist since no rules are provided on how a port-state may detain offending ships

⁹² The Timor Gap where both Australia and East Timor had overlapping claims to the Continental Shelf created political tensions over oil and gas operations until the signing of the Greater Sunrise International Unitization Agreement in 2003.

⁹³ Convention on the International Maritime Organization (adopted 6 March 1948, entered into force 17 March 1958) 289 UNTS 48 (IMO Convention).

⁹⁴ Flag States are the states under which a vessel is legally registered.

⁹⁵ This regulation forms part of The Protocol of 1997 (MARPOL Annex VI) (entered into force in 2005) <[http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Pages/The-Protocol-of-1997-\(MARPOL-Annex-VI\).aspx](http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Pages/The-Protocol-of-1997-(MARPOL-Annex-VI).aspx)> accessed 19 September 2015; ‘Prevention of Air Pollution from Ships’ <http://www.imo.org/blast/mainframe.asp?topic_id=233> accessed 19 September 2015

⁹⁶ The MARPOL training website lists 25 amendments between 1987 and 2007. ‘Status of MARPOL 73/78, amendments and related instruments’ <<http://www.marpoltraining.com/MMSKOREAN/MARPOL/AddInfo/4.htm>> accessed 19 September 2015

and jurisdictional issues exist which weaken the convention and helps explain why in a review of 1000 alleged violations of MARPOL 73/78 only seventy seven resulted in fines, eight in warnings and ten unspecified actions.⁹⁷ Even considering these weaknesses the convention is considered as customary international law⁹⁸ and as such may be considered to even bind States that have not ratified the treaty.

5.8.2. Legal Regime Applying to Platforms

Whilst the founding principles of the IMO clearly aim to govern oil and gas shipping there is a wide debate as to whether such convention also covers offshore oil and gas platforms. There are various different types of oil and gas platforms whose design basis and form to connect to the seabed differs and hence the IMO and national laws treat these different modalities differently.

MARPOL 73/78 provides one of the few definitions of a ship. Article 2(4) defines a ship as “a vessel of any type whatsoever operating in the marine environment and includes hydrofoil boats, air-cushion vehicles, submersibles, floating craft and fixed or floating platforms” which would suggest that even though the convention was drafted construing ships in their traditional sense most oil platforms would actually be covered by the convention. The 1990 OPRC definition of a ship differs to MARPOL 73/78 as it removes the mention of fixed or floating platforms⁹⁹ which are referred to separately as “offshore units”. Later guidelines issued by the IMO on the application of Annex I to Floating Production, Storage and Offloading facilities FPSOs and FSUs¹⁰⁰ make it clear that the IMO considers FPSOs and FSUs fall within their ambit and gives states jurisdiction on FPSOs and FSUs but the failure to mention other forms of platform leaves doubt over their inclusion. The Honorable Justice Stevens considers many jack-up rigs as vessels as are floating off-shore storage units which are typically made from converted oil tankers or purpose built vessels, but the IMO has not provided clear

⁹⁷ M Smith, ‘The Deepwater Horizon Disaster: An Examination Of The Spill’s Impact On The Gap In International Regulation Of Oil Pollution From Fixed Platforms’ (2011) 25 EILR 1477, 1482 cited in R Becker, ‘Note, MARPOL 73/78: An Overview in International Environmental Enforcement’ (1998) 10 Geo Intl Env’tl L Rev 625, 628.

⁹⁸ *ibid* 1483.

⁹⁹ *ibid* art 2(3).

¹⁰⁰ Guidelines For Application Of MARPOL Annex I Requirements To FPSOS And FSUS (10 November 2003) MEPC/Circ.406 <<http://www.sjofartsverket.se/pages/7148/406.pdf>> accessed 10 September 2015; Revised Guidelines For Application of the Revised MARPOL Annex I Requirements To FPSOS And FSUS (MEPC 53/24/Add.2) (adopted on 22 July 2005) Annex 32 Resolution Mepc.139(53) <[http://www.imo.org/blast/blastDataHelper.asp?data_id=18858&filename=139\(53\).pdf](http://www.imo.org/blast/blastDataHelper.asp?data_id=18858&filename=139(53).pdf)> accessed 10 September 2015

definitions of what it considers to be a vessel and so some ambiguity remains.¹⁰¹ The Macondo blowout in 2010 provided some insight on whether semi-submersibles are vessels covered by the IMO¹⁰² when in a subsequent legal case Judge Barbier held that the semi-submersible rig was a vessel in navigation.¹⁰³ The term vessel is often used interchangeably with the term ship and has the same meaning and so the ruling appears to suggest IMO conventions apply to semi-submersible offshore platforms. However there still remains a lack of clarity on precisely what platform types are covered by the IMO.

The obligations generated by MARPOL 73/78 with respect to platforms are limited. Important obligations regarding the monitoring and reporting of a pollution incident¹⁰⁴, settlement dispute provisions which requires arbitration in the event a settlement cannot be reached¹⁰⁵ and provisions regarding the interchange of information between States,¹⁰⁶ are contemplated; with each of these provisions typically found in framework agreements. The OPRC¹⁰⁷ requires operators of oil and gas platforms under their jurisdiction to have oil pollution emergency response plans¹⁰⁸ and it requires States to develop a national system for responding promptly and effectively to oil pollution incidents¹⁰⁹ and lays down the minimum requirements of such systems. The convention however places limits on its application, for example Regulation 39 of Annex I sets special requirements for fixed or floating platforms but limits the application of this to machinery space drainage and contaminated ballast and hence deals with pollution purely related to shipping aspects rather than oil and gas production.

¹⁰¹ H Rares, 'An International Convention on Off-Shore Hydrocarbon Leaks?' (2012) 26 ANZ MAR LJ 10, 16.

¹⁰² In 2010 the Deepwater Horizon semi-submersible offshore oil drilling rig owned by Transocean but under contract to BP suffered a large blowout causing the loss of life of 11 crewmen and a large oil spill which created environmental damage across the Gulf of Mexico. For further see 'Investigation Report Volume 1 Explosion and Fire at the Macondo Well'; 'Investigation Report Volume 2 Explosion and Fire at the Macondo Well' <http://www.csb.gov/assets/1/7/Vol_2_Final_Version.pdf> accessed 25 July 2015

¹⁰³ Rares (n 101).

¹⁰⁴ art 8.

¹⁰⁵ *ibid* art 10.

¹⁰⁶ *ibid* art 11.

¹⁰⁷ Convention on Oil Pollution and Preparedness, response and cooperation (adopted 30 November 1990, entered into force 13 May 1995) 1891 UNTS 51 (OPRC) article 2(3).

¹⁰⁸ art 3 (2).

¹⁰⁹ *ibid* art 6.

5.8.3 Legal Regime applying to Pipelines

The potential impact which offshore pipelines can have on both the seabed and marine environment is considerable both during their construction and during their operation.¹¹⁰ As pipelines transport oil and gas from areas of production to processing areas it is not uncommon for them to pass over national borders and so some form of international law governing their construction, operation and decommissioning would be expected, but once again applicable legal rules are limited. UNCLOS provides States the right to lay submarine cables and pipelines on the continental shelf subject to the Coastal States right to take reasonable measures for the exploration and exploitation of its natural resources and the prevention, reduction and control of pollution.¹¹¹ Consent is required from the Coastal State which has territorial sovereignty.¹¹² Countries should also “have due regard to cables or pipelines already in position”¹¹³ which whilst directed towards maintenance issue also provides an argument for third party access and pipeline capacity expansion in line with the petroleum conservation principle of minimizing economic costs. For the High Sea all States are granted the freedom to lay submarine cables and pipelines¹¹⁴ and are responsible for their maintenance.¹¹⁵

No international guidelines exist on pipeline decommissioning and so good industry practice should be applied.¹¹⁶ OSPAR is considered a reference of good industry practice and provides that no offshore pipeline may be dumped and “no disused offshore installation shall be left wholly or partly in place in the maritime area without a permit.”¹¹⁷ Further OSPAR provides that neither

¹¹⁰ For example the UK’s Health and Safety Executive’s Offshore Division reports 44 dangerous occurrences from its 14,000 km of offshore pipelines between 2010 and 2015; Annual Offshore Statistics & Regulatory Activity Report 2014/2015 <<http://www.hse.gov.uk/offshore/statistics/hsr1415.pdf>> accessed on 20 September 2015

¹¹¹ art 79 (1).

¹¹² *ibid* art 79.

¹¹³ *ibid* art 79 (5).

¹¹⁴ *ibid* art 112.

¹¹⁵ *ibid* arts 113, 114, 115.

¹¹⁶ The provisions of OSPAR decision 98/3 do not apply to pipelines and the oil company Tullow recommend good industry practice from the GOM and North Sea should be used. Decommissioning and abandonment <<https://www.tulloil.com/Media/docs/default-source/operations/ghana-eia/environmental-impact-statement/jubilee-field-eia-chapter-8.pdf?sfvrsn=2>> accessed on 20 October 2015. By 2013 over 833km of pipelines had been decommissioned in the North Sea. Decommissioning of Pipelines in The North Sea Region 2013 <<http://oilandgasuk.co.uk/wp-content/uploads/2015/05/OP083.pdf>> accessed 20 October 2015

¹¹⁷ Annex III art 5(1).

installations nor pipelines should receive such a permit if they contain substances hazardous to human health, marine ecosystems or other uses of the sea.¹¹⁸

5.8.4. Legal Regime During Construction & Operations

The 1958 Convention on the Continental Shelf was one of the first international treaties applicable to offshore installations and provides States with the right to construct, maintain and operate exploration and exploitation activities on offshore installations over their continental shelf.¹¹⁹ It also establishes the obligation to remove abandoned and disused offshore installations and the right to develop safety zones around such facilities.¹²⁰ Agreed at the first United Nations Convention on the Law of the Sea this convention acted as the forerunner to UNCLOS.

In the EEZ UNCLOS provides Coastal States the right to construct and regulate the construction, operation and use of offshore installations and structures for the purposes of exploring and exploiting natural resources.¹²¹ With regards to the continental shelf UNCLOS authorizes States to regulate continental shelf drilling¹²² whilst on the High Seas States are free to construct installations permitted by international law and subject to the continental shelf provisions.¹²³ States also have the right to exploit their natural resources pursuant to their environmental policies and their duty to protect and preserve the marine environment.¹²⁴

5.8.5. Legal Regime applying to Decommissioning

As the number of mature fields increases and the economic lives of producing fields comes to an end a growing concern for decommissioning both at the national and international level continues to amount. The threat and risk to marine and

¹¹⁸ *ibid* art 5(2).

¹¹⁹ art 1 defines continental shelf as “referring (a) to the seabed and subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 meters or, beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources of the said areas; (b) to the seabed and subsoil of similar submarine areas adjacent to the coasts of islands.”

¹²⁰ *ibid* arts 5(5), 5(2).

¹²¹ arts 56, 60.

¹²² *ibid* art 81.

¹²³ *ibid* art 87(d).

¹²⁴ *ibid* art 193.

human life from discarded equipment and installations poses an imminent danger.¹²⁵

There are different options available for decommissioning oil and gas facilities each which have different costs, health and safety implications and environmental impacts. Decommissioning will affect every well at one time and should be considered from the outset of any operation.¹²⁶ Whilst the oil and gas companies normally determine decommissioning plans a national regulator will typically review and audit such activities. The North Sea and the Gulf of Mexico have seen the greatest amount of decommissioning and represent areas where best practice has been developed.

The 1958 Convention on the Continental Shelf establishes an obligation upon States to remove abandoned and disused offshore installations.¹²⁷ During the discussions on UNCLOS the “enormous costs” associated to a general removal obligation was a concern, the resultant Article 60(3) provides that “installations or structures which are abandoned or disused shall be removed to ensure safety of navigation, taking into account any generally accepted international standards established in this regard by the competent international organization. Such removal shall also have due regard to fishing, the protection of the marine environment and the rights and duties of other States. Appropriate publicity shall be given to the depth, position and dimensions of any installations or structures not entirely removed.” It therefore appears to oblige decommissioning but allows for States to freely determine how this is done considering the particular circumstances of the installation and always taking into account “generally accepted international standards.”¹²⁸ There is however some disagreement on the

¹²⁵ E Kasimbazi, ‘Environmental Regulation of Oil and Gas Exploration and Production in Uganda’ (2012) 30 JERL 185, 193 referring to the Environmental Sensitivity Atlas for the Albertine Graben, National Environment Management Authority (2nd edn, Republic of Uganda 2010) 13.

¹²⁶ “By their nature, most exploration wells will be unsuccessful and will be decommissioned after the initial one-to-three months of activity. It is, therefore, prudent to plan for this from the outset, and ensure minimal environmental disruption.” Environmental Management in Oil and Gas Exploration and Production Guidelines 10.

¹²⁷ Convention on the Continental Shelf art 5(5).

¹²⁸ The decommissioning of the Brent Spar in the North Sea illustrates the value of reviewing the particular circumstances to determine the best means for decommissioning. Shell initially planned to decommission the storage facility in North Feni Ridge in the deep ocean based upon an analysis which showed it was cost efficient and it posed the least health and safety risk and the environmental damage would be limited. Greenpeace opposed and raised public opinion against Shell saying they were taking the least cost approach and as a result Shell was forced to alter its decommissioning plans and dismantled the facility onshore in Norway. After the decommissioning it became evident that the original decommissioning plan would have caused less environmental damage.

precise scope of Article 60. Some scholars suggest “UNCLOS has left to the discretion of the Coastal States the decision on creating a removal obligation”¹²⁹ and that the failure to define abandoned and disused installations creates uncertainty of when a facility should be decommissioned and whether submarine cables and pipelines fall within the scope of the article.¹³⁰

There are various alternative uses of oil and gas installations which can include their conversion into more environmental friendly fittings, such as marine research stations, alternative power generation facilities, bases for search and rescue or being abandoned and turned into artificial reefs. The transformation may provide environmental benefits since oil and gas facilities and their associated pipelines often have been at sea for several decades in which they may have become part of the marine environment encrusted with marine life forms.¹³¹ A criticism of Article 60 of UNCLOS is its failure to incorporate the option to rehabilitate or transform offshore facilities.

Further Article 60 of UNCLOS raises the question of what are “generally accepted international standards”. The World Bank issued guidelines which many international lenders use to evaluate whether projects are operating to international standards. The World Bank guidelines on “Environmental, Health, and Safety Guidelines for Offshore Oil and Gas Development” states that “internationally recognized guidelines and standards issued by IMO and OSPAR should be followed for the decommissioning of offshore facilities.”¹³² Further in 1989 the IMO introduced “Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive

¹²⁹ E Brown, ‘The significance of a possible EC EEZ for the law relating to artificial islands, installations, and structures, and to cables and pipelines, in the exclusive economic zone’ (1992) 23 OD and IL 132.

¹³⁰ P Peters, A Soons and L Zima, ‘Removal of installations in the Exclusive Economic Zone’ (1984) 15 NED YIL 167; V Becker-Weinberg, *Joint Development of Hydrocarbon Deposits in the Law of the Sea* (Springer - Verlag Berlin Heidelberg 2014) 83.

¹³¹ M Henrion, B Bernstein and S Swamy, ‘A Multi-attribute Decision Analysis for Decommissioning Offshore Oil and Gas Platforms’ (2014) IEAM
<www.lumina.com/uploads/case_studies/Oil_rig_decommissioning_decision_analysis_Henrion_et_al_2014.pdf> accessed 24 November 2015. Henrion provides a case study on the decommissioning plans for 27 offshore platforms in California which provides insight on how decommissioning offshore structures can negatively affect marine life.

¹³² Environmental, Health, and Safety Guidelines for Onshore Oil and Gas Development, The World Bank Group (30 April 2007)
<<http://www.ifc.org/wps/wcm/connect/4504dd0048855253ab44fb6a6515bb18/Final%2B%2BOnshore%2BOil%2BAnd%2BGas%2BDevelopment.pdf?MOD=AJPERES&id=1323153172270>> accessed 16 October 2015; Environmental, Health, and Safety Guidelines for Offshore Oil and Gas Development, The World Bank Group (5 June 2015)
<www.ifc.org/wps/wcm/connect/f3a7f38048cb251ea609b76bcf395ce1/FINAL_Jun+2015_Offshore+Oil+and+Gas_EHS+Guideline.pdf?MOD=AJPERES> accessed 16 October 2015

Economic Zone” that require the removal of offshore installations on the continental shelf or EEZ unless an exemption applies.¹³³ The IMO guidelines determined that the removal obligation applies only to installations “standing in less than 75 m of water and weighing less than 4,000 tones in air” or “structures emplaced on the sea-bed on or after 1 January 1998, standing in less than 100m of water and weighing less than 4,000 tones.”¹³⁴

Unfortunately the standards for removing installations are very general and therefore lack detailed information on removal costs, safety risks, potential alternative uses, risk that the installation will shift from its position, deterioration rate of the installation and potential marine environment impacts and the safety of navigation.¹³⁵ Whilst this general approach is very pragmatic it has limited legal clarity to promote conservation principles.

The OSPAR Decision 98/3 on the Disposal of Disused Offshore Installations came into effect in 1999 and prohibits either the dumping or leaving in whole or part disused offshore installations within the maritime area.¹³⁶ Similar to the IMO Guidelines OSPAR allows a competent authority to permit older structures built prior to 1999 to be exempt from the regulations¹³⁷ as may other installations under exceptional circumstances which take into account environmental impacts, re-use, recycling, disposal options, safety considerations, energy use and emissions, community impact and economic aspects.¹³⁸ Unfortunately this is a framework applying only to certain EU nations and therefore its scope of applicability is limited.

One form of decommissioning is the deliberate disposing of an installation at sea known as “dumping.”¹³⁹ UNCLOS requires States to “adopt laws and regulations to prevent, reduce and control pollution of the marine environment by dumping.”¹⁴⁰ The convention also requires States to develop “global rules” and best practices which set common grounds for States to develop national

¹³³ Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone, IMO Guidelines and Standards (1989) Resolution A. 672 (16) (IMO Guidelines) art 1(1)
<http://www.imo.org/blast/mainframe.asp?topic_id=1026> accessed 19 October 2015

¹³⁴ *ibid* art 3(1), 3(2).

¹³⁵ *ibid* arts 2, 3.

¹³⁶ (adopted 23 July 1998, entered into force 9 February 1999) art 2.

¹³⁷ *ibid* art 3(a).

¹³⁸ *ibid* Annex 2 establishes a framework to assess the disposal of offshore structures.

¹³⁹ UNCLOS art 1(5) provides a definition of dumping.

¹⁴⁰ *ibid* art 210.

standards¹⁴¹. The basis for “global rules” are found in the UN 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter updated in 1996¹⁴² to incorporate principles such as the precautionary approach¹⁴³ from the 1992 Earth Summit in Rio de Janeiro. The convention allows offshore disposal of installations once a permit has been obtained from the affected State. Though beyond this initiative there have been no global developments to provide a comprehensive framework on dumping guidelines and whilst UNCLOS requires the coastal state or flag state to enforce municipal laws¹⁴⁴ without the development of more detailed international guidelines many municipal laws will remain weak.

Regarding “generally accepted international standards” for decommissioning of onshore operations the World Bank “Environmental, Health, and Safety Guidelines for Onshore Oil and Gas Development” aims to provide examples of “Good International Industry Practice.”¹⁴⁵ Decommissioning of onshore facilities is defined widely so as to cover “permanent facilities and well abandonment, including associated equipment, material, and waste disposal or recycling.”¹⁴⁶ Whilst the guidance on well abandonment is quite strict requiring wells to be plugged and aquifers to be isolated the guidance on pipelines is less so and even allows for pipelines to be left in place. The guidelines include a requirement to develop a decommissioning plan “during field operations.” By stating during field operations it is unclear whether the decommissioning plan should form part of the reservoir development plan or come later. Arguably the decommissioning plan should always be developed from the outset to allow authorities to consider the overall environmental risks associated to a project in a holistic manner and prior to its approval.

¹⁴¹ *ibid* art 210(4), 210(6).

¹⁴² 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (adopted 7 November 1996, entered into force 24 March 2006) 1046 UNTS 120.

¹⁴³ Rio Declaration Principle 15 states “In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”

¹⁴⁴ art 216.

¹⁴⁵ Environmental, Health, and Safety Guidelines for Onshore Oil and Gas Development.

¹⁴⁶ *ibid* 15.

Oil and Gas companies have also been working to develop decommissioning guidelines and the Oil Industry International Exploration and Production Forum (E&P Forum) is one of the most recognized bodies doing so.¹⁴⁷

5.9. How do Framework Agreements incorporate Environmental Law provisions?

The range of national laws which apply to oil and gas operations is typically large and complex with the applicable environmental provisions alone normally to be found in several laws and regulations.¹⁴⁸ The complexity of having a potential conflict of laws among affected States for THRs development is more apparent than ever and is something that would greatly deter the interest of most rational investors and sound oil and gas operators. As mentioned in previous Chapters, a framework agreement offers States the opportunity to clarify, harmonize and unify a comprehensive legal framework by molding together various laws, principles, guidelines, standards and practice. In this section a review of how framework agreements approach environmental law is conducted.

Whilst there is an abundance of literature on the obligation between States to work together in THRs and critiques of the different joint development agreements there is limited literature examining environmental provisions in joint development agreements¹⁴⁹ and the author has found none dedicated solely to environmental assessment and protection in framework agreements. The review of environmental provisions within framework agreements is based upon an

¹⁴⁷ Environmental Management in Oil and Gas Exploration and Production Guidelines 22.

Other groups include IPIECA which is a global oil and gas industry association for environmental and social issues and some of its guidelines on “good practices” cover decommissioning, for example The IPIECA water management framework applies from the planning through to the decommissioning phase.

¹⁴⁸ Examples of municipal legislation that may apply to petroleum operations include: Petroleum laws; Planning laws; Environmental Protection Acts; Environmental Impact Assessment; Clean Air and Water Acts; Water Catchment Protection; Marine Pollution; Standards for Noise, Radiation, Chemical Exposure; Discharge and Management of Wastes; Land Contamination or Land Disturbance; Permitted Chemicals; Safety and Fire Regulations; Control of major hazards; Storage and usage of chemicals; Public and worker health and safety; National Park or Protected Area laws; Forest Protection laws; Protection of indigenous and cultural heritage; Fishery Protection; Marine Navigation and Safety. Refer to Chapter 2 Section 2.4. Recent Trends in Petroleum Conservation Laws and Regulations.

¹⁴⁹ Low, ‘Marine Environmental Protection’ (n 4) 45, referring to D Ong, ‘The Progressive Integration of Environmental Protection within Offshore Joint Development Agreements’ in M Fitzmaurice and M Szuniewicz (eds), *Exploitation of Natural Resources in the 21st Century* (KIL 2003) 113; P Birnie, ‘Protection of the Marine Environment in Joint Development’ in H Fox (ed), *Joint Development of Offshore Oil and Gas* (1990) 1 BIICL 202; A Read, ‘Protection of the Marine Environment: A View from Industry’ in H Fox (ed), *Joint Development of Offshore Oil and Gas* (1990) 1 BIICL 223.

analysis, as with the previous chapters, of the following recent framework agreements: 2006 UK - Norway; 2007 T&T - Venezuela; 2007 Canada - France; 2008 Iceland - Norway; 2012 Norway - Russia; and 2012 US - Mexico.

5.9.1. Framework Agreement Provisions on General Environmental Principles

In the earlier section on generally applicable environmental law a wide range of approaches to environmental provisions were reviewed covering from sustainable development principles, biological diversity, holistic approach to nature, HEAs, LCA, CBA, SEAs, ICZMs, MSPs, EIAs, the precautionary principle, the polluter pays principle, producer responsibility and industry guidelines relating to monitoring, audit and review of environmental risks. The application of framework agreements to THR and the multinational approach to managing the Arctic draws many parallels. In the Arctic “the legal regime governing the Arctic region is now a vast and complex collection of principles, treaties, conventions and soft law”¹⁵⁰ and requires the introduction of “a system of integrated environmental management.”¹⁵¹ To Gladun the protection of the arctic environment requires the implementation of “existing international soft-law into national strategies and legislation.”¹⁵² The same is true for framework agreements but unfortunately all of the framework agreements fail to do so.

A broad obligation on oil and gas companies to minimize significant negative impacts on marine and coastal environment is contained in each framework agreement which could be argued provides the scope for the inclusion of soft law. The 2002 Report of the UK - Norway Co-operation Workgroup, a precursor to the UK -Norway Framework Agreement, specifically recommended that “a mechanism to manage efficiently the UK and Norwegian environmental impact assessment and approval processes” be developed for THRs ¹⁵³ but this recommendation was regrettably not incorporated into the agreement. In fact none of the framework agreements require an EIA. Some of the agreements require government actors to monitor environmental compliance but none

¹⁵⁰ Gladun (n 18) 94.

¹⁵¹ Isted (n 18) 371.

¹⁵² Gladun (n 18) 95.

¹⁵³ Unlocking Value Through Closer Relationships, Report of the UK- Norway North Sea Cooperation Workgroup (2002) 27.

obligate the oil companies to monitor their environmental impacts.¹⁵⁴ The France - Canada Framework Agreement hints at the applicability of ICZMs and MSPs in its preamble where it recognizes each governments “management measures” over the maritime zone¹⁵⁵ but it fails to provide anything further within the main body of the treaty. The UK and Norway as signatures of OSPAR could be expected to include elements of ICZMs, SEAs and MSPs yet their framework agreements never raise the matter. The UK - Norway Framework Agreement considers how oil and gas developments should take advantage of existing infrastructure to develop THRs,¹⁵⁶ which whilst this acknowledges principles of ICZM it falls short of ICZM objectives.

Many of the agreements provide an opportunity to incorporate detailed provisions on their environmental approach when their corresponding plenary organs develop regulations surrounding the agreements. Creating an opportunity which should not be missed if the agreements are to provide any clarity on their environmental framework.

5.9.2. Framework Agreement Provisions on Shipping

Environmental obligations imposed upon shipping are a clear ambit of the IMO and framework agreements tend to leave the matter with the IMO. In fact only the France - Canada and T&T - Venezuela Framework Agreements specifically mention shipping but both of these do so with regard to minimizing any negative impact on marine and coastal environment and fishing operations.¹⁵⁷ Framework agreements broad obligation on Oil and Gas Companies to minimize significant negative impact on marine and coastal environment¹⁵⁸ or their requirement to apply national law¹⁵⁹ places a general environmental obligation on shipping but it

¹⁵⁴ UK - Norway Framework Agreement art 1(6); US - Mexico Framework Agreement art 18.

¹⁵⁵ Canada Oceans Act was passed in 1997 and is slowly being regulated and the release of the Ocean Action Plan in 2005 establishes principles of integrated coastal management whilst France is party to the OSPAR Convention which requires MSP assessment.

¹⁵⁶ The Framework Agreement refers to this as “Host Facilities” and dedicates the whole of Chapter 4 to the topic.

¹⁵⁷ Trinidad & Tobago - Venezuela Framework Agreement art 9(1); France - Canada Framework Agreement art 13.

¹⁵⁸ 2007 Trinidad & Tobago - Venezuela Framework Agreement arts 3(1), 8(1), 9(1); 2007 France - Canada Framework Agreement art 13; 2012 US - Mexico Agreement art 2(j) requires the Unitization Agreement to incorporate safety and environmental measures to be taken under the municipal laws of each Party and art 19(3) recognizes international obligations “with respect to oil pollution preparedness, response, and cooperation, and are to review their implementation of such obligations in light of the activity contemplated under this Agreement”.

¹⁵⁹ 2006 UK-Norway Framework Agreement art 1(5) requires compliance with the standards required by the State issuing the authorizations but similarly suggests a common standards should be sought by both governments; 2008 Iceland-

would appear the intention of the framework agreements is to leave this area under the IMO's scope.

5.9.3. Framework Agreement Provisions on Platforms

A lack of clarity exists on the international environmental law applicable to oil and gas platforms yet none of the current Framework Agreements have taken the opportunity to clarify the matter. As Framework Agreements establish a plenary body to develop the rules applicable to each Framework Agreement an opportunity remains to rectify.¹⁶⁰

Framework Agreements typically incorporate monitoring provisions, which cover health, safety and environmental compliance, with their objective to ensure compliance with any field development plan. The provisions typically cover the interchange of information to ensure both governments are fully informed. It would be a natural extension of these provisions for the Framework agreements to develop monitoring and reporting provisions to cover pollution incidents and remove the uncertainty over the application of the IMO rules. The typical approach taken by the Framework Agreements is to refer the matter to their plenary organs. The T&T -Venezuela Framework Agreement requires applicable laws and relevant international and regional standards to apply with the competent authorities agreeing upon steps to be taken in the event of an emergency.¹⁶¹ The UK - Norway Framework Agreement raises the matter of an environmental emergency but falls short of determining what should occur by requiring government consultations to agree on appropriate joint measures and measures to be taken in an emergency.¹⁶² Similarly the US – Mexico Framework Agreement recognizes obligations with

Norway Framework Agreement art 56 "The two Parties shall consult each other with a view to ensuring that health, safety and environmental measures are taken in accordance with the national laws of each Party" and 2012 Norway-Russia Framework Agreement Annex II art 1(10) which has a similar wording.

¹⁶⁰ However the one example of where a Framework Agreement has been further developed is the Loran-Manatee field under the ambit of the T&T -Venezuela Framework Agreement. The agreement adds no further environmental provisions to those within the initial agreement which does not generate much hope for the other Framework Agreements. Unitization Agreement for the Exploitation and Development of hydrocarbon reservoirs of the Loran-Manatee Field (T&T – Venezuela) text registered with the UN No. 50197 (Loran – Manatee Field Agreement) art 5.1 states the field will develop "in conformity with internationally accepted standards and consistent with the best practices of the petroleum and gas industry; as well as pursuant to environmental and security laws, rules and standards, as provided by the principles set forth in the Framework Agreement and in the legislation of each Party."

¹⁶¹ arts 9(2), 9(3), 10(6)(2) Loran-Manatee Field Agreement provided an opportunity for such competent authorities to determine such emergency procedures but it is silent on the matter.

¹⁶² arts 1(9), 1(5)(5).

“respect to oil pollution preparedness, response, and cooperation” and then leaves the plenary organ to “ensure an appropriate framework” is put in place.¹⁶³ In the event of significant risk of damage to the environment a State Inspector may order the immediate cessation of activities.¹⁶⁴ The France - Canada Framework Agreement purely provides that each party acts as agreed in an emergency plan in the event of a spillage.¹⁶⁵ The Framework Agreements of Iceland - Norway and Russia - Norway are silent on the matter.

5.9.4. Framework Agreement Provisions on Pipelines

International Environmental law on pipelines is minimal beyond the general provisions of preventing, reducing and controlling pollution. Municipal laws allow for the particularities of a natural environment to be contemplated, for example is the ocean geography largely reef or deep water, and a framework agreement which focuses on the boundaries between two or more States should be able to consider the local environment and develop appropriate regulations. The France - Canada Framework Agreement requires infield pipeline construction to be authorized by each government¹⁶⁶ but provides no guidance as to how they are authorized and the presumption exists that municipal laws apply. The T&T - Venezuela Framework Agreement considers the matter defining Cross Border Pipelines¹⁶⁷ and providing for its construction and operation.¹⁶⁸ However the treaty fails to provide any guidance beyond requiring the design, construction and maintenance of pipelines to be subject to “national laws and international safety and construction standards.”¹⁶⁹ The framework agreement does impose an obligation on the governments to ensure pipelines do not cause “pollution to the marine environment, the coastlines, shore facilities, vessels or fishing gear of either Party” which obliges States to determine what such measures should be. The agreement also stipulates that the parties should cooperate to adopt safety

¹⁶³ art 19(3).

¹⁶⁴ art 18(5).

¹⁶⁵ art 14.

¹⁶⁶ art 10.

¹⁶⁷ art 1.

¹⁶⁸ *ibid* art 2(2)(c).

¹⁶⁹ *ibid* art 8(3), 10(1).

measures on pipelines.¹⁷⁰ The US - Mexico Framework Agreement considers a pipeline as part of the “facilities” of a THR operation and therefore it seems that the content of the treaty applies fully to pipelines including the general obligation on the governments to adopt “where appropriate, common safety and environmental standards and requirements.”¹⁷¹ Whilst most framework agreements exist to encourage oil and gas operations in unexplored regions the UK-Norway Framework Agreement applies to a maturing basin and its purpose is to assist the development of marginal fields along national boundaries. The region has a pre-existing infrastructure in place and the agreement includes provisions on accessing this so to minimize economic costs and environmental impacts. For new pipelines the framework agreement applies general environmental principles and places the obligation on both Governments to “make every endeavor” to ensure that the construction and operation of a pipeline “shall not cause pollution of the marine environment or damage by pollution to the coastline, shore facilities or amenities, or damage to sensitive habitats or damage to vessels or fishing gear of any country” and develop the appropriate implementation procedures.¹⁷² However the scope of these procedures appears restricted as where the governments agree to build and operate a cross border pipeline each government must grant the “authorizations required by their respective national law”¹⁷³ and there is no mention of the applicable implementation procedures. The Iceland - Norway and Norway - Russia Framework Agreements are silent on pipelines environmental provisions and only a general provision of complying with municipal laws of both States applies.¹⁷⁴

5.9.5. Framework Agreement Provisions on During Construction & Operations

The main international legal rules during construction and operation are on the granting of the right to construct and enact exploration and exploitation operations, the right to develop safety zones around installations and soft law

¹⁷⁰ *ibid* art 10(6)(2) the subsequent Loran-Manatee field agreement is silent on these matters and a lack of clarity remains on what these measures might be.

¹⁷¹ art 19(1).

¹⁷² UK - Norway Framework Agreement art 1(5)(4)(a), 1(5)(5).

¹⁷³ *ibid* art 2(1)(1).

¹⁷⁴ Iceland - Norway art 3(10); Norway-Russia art 6(10).

provisions and operational guidelines issued by various global institutions. Municipal laws define stricter and more precise rules and many of the framework agreements seem to fall back on these. For example, the Iceland - Norway Framework Agreement states that, “the two Parties shall individually grant all necessary authorizations required by their respective national laws for the development and operation of the transboundary hydrocarbon deposit.”¹⁷⁵

Beyond the general obligations to minimize and control environmental risks the framework agreements do not look to extend any further obligations. There are numerous operational guidelines issued by multilateral institutions, industry organizations and operating companies and the framework agreements fails to demand compliance with any of such important guidelines. Each framework agreement requires the operators to execute a unitization agreement that requires the approval of both governments¹⁷⁶ and some also require the submittal of a development plan¹⁷⁷. The content of the unitization agreement and or development plan could provide some guidance on environmental considerations during construction and operation but few of the framework agreements detail the content requirements of the unitization agreement and those that do broadly state it should cover environmental protection.¹⁷⁸ For development plans the situation is worse since there is no mention of environmental measures with the exception of the US -Mexico Framework Agreement¹⁷⁹ which refers to municipal laws.

5.9.6. Framework Agreement Provisions on Decommissioning

The incorporation of decommissioning provisions in Framework Agreements is critical since it has significant social and environmental cost, and health and safety implications. As discussed above international law provides some general guidelines but they are vague and contain numerous exceptions. Nonetheless a

¹⁷⁵ Iceland - Norway Framework Agreement art 3.5 – Annex II art 1.5 provides a similar provision in the Norway - Russia Framework Agreement, art 11(1) of the France - Canada Framework Agreement grants each Party the right to apply its own laws on safety measures.

¹⁷⁶ 2006 UK - Norway art 3(2); 2007 T&T - Venezuela art 3(4)(2); 2007 Canada-France arts 5(1), 5(2); 2008 Iceland - Norway art 1; 2012 Norway - Russia Annex II art 1(8); and 2012 US - Mexico art 6(1).

¹⁷⁷ 2006 UK - Norway art 3(9); 2007 T&T - Venezuela art 3(6); 2007 France - Canada art 9; 2012 US - Mexico art 6(2)(d).

¹⁷⁸ France - Canada art 9 - requires an approved development plan which Annex V (e) defines to include environmental protection measures.

¹⁷⁹ arts 6(2)(d) and (j) require the unitization to include a development plan and details of the “safety and environmental measures to be taken under the national laws of each Party.”

framework agreement should consider the local environments to provide clear guidelines.

The framework agreements which Norway has with both Iceland and Russia fail to mention decommissioning at all and therefore implies that the application of a general provision to consult each other and ensure municipal laws are applied.¹⁸⁰ The France-Canada Framework Agreement is little better purely paying lip service to decommissioning by requiring the plan of abandonment to be presented for governmental approval within the development plan. No guidance on what considerations decommissioning should take are provided apart from restoring the area into an acceptable state.¹⁸¹ The US - Mexico Framework Agreement has similar failings as whilst it incorporates decommissioning into the definitions of “Construction and Operation” and “Exploitation” it contains no specific provision on decommissioning and so the matter falls within the general safety and environmental provisions requiring compliance with municipal laws and common safety and environmental standards.¹⁸²

The T&T - Venezuela Framework Agreement dedicates an article to the topic of decommissioning and requires the Unit Operator to submit decommissioning plans for approval and their updating every two years. The article also resolves one of the ambiguities of international law by stipulating that the plan applies to “installations, pipelines and other facilities.”¹⁸³ The article fails to detail the contents of the decommissioning plan only stipulating the adoption of “internationally accepted standards.”

The UK - Norway Framework Agreement provides some clarification on decommissioning. Similar to the US - Mexico Framework Agreement it incorporates decommissioning within the definition of “Construction and Operation” but not within the definition of exploitation but as per the T&T - Venezuela Framework Agreement it dedicates an article to decommissioning¹⁸⁴. The article requires a decommissioning plan to be approved by the governments and also details eleven criteria by which the governments will evaluate the plan.

¹⁸⁰ Iceland - Norway art 3(10); Norway - Russia Annex II art 1(10).

¹⁸¹ Appendix V art (d).

¹⁸² arts 6(2)(j), 19.

¹⁸³ art 10(5).

¹⁸⁴ art 1(14).

Amongst the criteria principles of safety, economic costs, environmental impacts and impacts upon other activities are included. The decommissioning plan is required for installations, which the framework agreement defines widely to cover almost all physical structures associated to an offshore development,¹⁸⁵ and its application to cross-border pipelines is expressly mentioned in the article to once again avoid the ambiguities of international law mentioned in the previous sections.

5.10. Conclusions

One of the central themes of petroleum conservation is minimizing environmental impacts of oil and gas operations. The duties of States in petroleum conservation are closely linked to the principles of sustainability which permeate international environmental law. Difficulties exist in the area of THRs where often it is difficult to predict which national and international laws, soft laws and guidelines, international standards and practices should apply and to what extent they promote petroleum conservation principles. There is little international environmental law applicable to offshore oil and gas operations with most of the applicable principles coming from guidelines and other soft law. Modern guiding principles of environmental law are largely based upon sustainability provisions to require a holistic review of the environment, a principle which is seeing growing applicability through an increasing requirement to perform HEAs and SEAs. The development of the HEAs and SEAs is also being complemented by an increasing array of tools and methodologies for their development and subsequent monitoring and review of resultant environmental impacts.

Whilst all framework agreements mention the need to minimize environmental impacts of oil and gas operations some define the scope of this much clearer than others. The Iceland - Norway and Norway - Russia Framework Agreements provide a very simplistic approach, which typically requires the application of national and international laws. Other framework agreements such as the UK - Norway Framework Agreement try to lay down a more comprehensive

¹⁸⁵ art 1(2) defines Installations as any artificial island, structure or other facility for petroleum activity, including drilling rigs, floating production units, storage units, flotel, well heads, intrafield pipelines and intrafield cables, but excluding supply and support vessels, ships that transport petroleum in bulk, other pipelines and cables.

framework by defining areas in which environmental laws will apply and requiring the plenary body to develop a regulatory framework based upon the common ground of the applicable municipal laws of both States. The UK - Norway Framework Agreement actually goes beyond and outlines some environmental obligations, such as on the decommissioning of oil platforms and pipelines and the requirement to perform mandatory EIAs. However, in general the environmental scope within framework agreements is bordering on the nonexistent.

The framework agreements fail to provide a comprehensive outline of the environmental provisions that their plenary bodies should develop in detail. For the plenary bodies to develop such regulation it is paramount that the framework agreement clearly defines the scope of what these rules are met to encompass. Overall current framework agreements have largely failed to take the opportunity to incorporate relevant soft-law provisions into their frameworks as they normally fall back on a general obligation of minimizing environmental impact. This failing leaves uncertainty over what environmental values, principles, rules, guidelines, standards and practices applies to THRs and generates potential interpretation problems for the plenary authorities in how they should govern environmental provisions.

As framework agreements mature what is going to be key for the achievement of environmental conservation principles is how the plenary bodies continue to incorporate environmental regulations. The current developments in this area are limited to the experience of the Loran-Manatee Field Agreement, which provides no additional environmental guidelines beyond those in the initial framework agreement. The subsequent Loran-Manatee field agreement is silent on all these matters and a lack of clarity remains on what these measures might be. It is therefore still unclear how these plenary bodies will regulate the framework agreements, but what is clear is that their actions will determine how successful the environmental regulations within framework agreements help achieve petroleum conservation principles.

Chapter 6. Conclusions and Outlook for the Progress of Petroleum Conservation Principles in International Law

Today, the time for a well-planned transition to a sustainable system is running out. We may be running in the right direction, but we are moving too slowly. We are failing in our responsibility to future generations and even to the present one.¹

Kofi Annan

6.1. Main Conclusions

The scope of international agreements covering the joint development of THRs was initially very limited with the simple intent of preventing political animosity between nations. Agreements such as the 1958 Agreement between Bahrain and Saudi Arabia simply defined political boundaries for petroleum exploitation and the form of sharing oil revenues. During the 1960's subsequent JDAs incorporated the concept of a plenary organ.² Often regarded as the first JDA, the 1965 Partition of the Neutral Zone between Kuwait and Saudi Arabia³ developed this concept into a framework for how to develop petroleum reserves in locations where disagreements over sovereignty exists. The Agreement developed the concept of providing a plenary organ specific authority to ensure optimal exploitation, with representatives from both parties granting a joint concession for the exploitation of petroleum and agreeing to establish legislation so as to prevent double taxation. Modern agreements have incorporated more notions to the concept of JDA and some modern day agreements now incorporate petroleum conservation matters covering governance, environment and sustainability. As government objectives

¹ Former UN Secretary-General. Speech delivered in Dhaka, Bangladesh, as reproduced in (2001) 31 *Env'tl Pol'y & L* 181.

² Agreement between the Austrian Federal Government and the Government of Czechoslovakia on the exploitation of the common oil and gas deposits (23 January 1960) 495 UNTS 134; Agreement between the State of Kuwait and the Kingdom of Saudi Arabia on the partition of the Neutral Zone (7 July 1965) 1750 UNTS 47.

³ Agreement between the State of Kuwait and the Kingdom of Saudi Arabia on the partition of the Neutral Zone (7 July 1965) 1750 UNTS 47. C Low, 'Marine Environmental Protection in Joint Development Agreements' (2012) 30 *JERL* 45, 59.

for each agreement differ, this progression has not always been linear and agreements whose focus may not centre on petroleum exploitation, such as the 2003 Barbados and Guyana treaty, exclude many elements of the concept. However the exclusion of many of the notions does not necessarily mean the agreements are poorly drafted, and the fact that Hazel Fox identified twelve such agreements in existence back in 1989⁴ and a number of agreements have since been concluded⁵, shows the confidence which governments have placed in JDAs to develop reserves in areas of disputed sovereignty.

In the same way in which JDAs have sought to provide a framework to develop reserves in maritime areas of disputed sovereignty, Framework Agreements seek to provide a mechanism for the efficient development of THRs. Whilst the initial Framework Agreement between the UK and Norway showed great promise for establishing an approach for the development of THR's for the benefit of all parties, subsequent agreements have failed to consistently develop this approach. Considering Norway was a party to the initial agreement with the UK, the petroleum conservation and governance regressions within the Agreements between Norway - Iceland and Norway - Russia were particularly disappointing. Iceland is not well known for its petroleum legislation and general laws and regulations on taxation, environmental protection, health and safety apply to the sector; whilst Russia is not known for good governance, ranking 136 out of 175 countries on the Transparency International's Corruption Perceptions Index⁶ and 75 out of 102 countries on the WJP Rule of Law Index 2015⁷; both rankings consider governance aspects within their methodology. On the other hand both the UK and Norway have well-developed petroleum legislation and have good governance procedures⁸ suggesting that the content of the resultant Framework Agreement is partially the result of the joint experiences of both parties' petroleum and environmental legal systems and good governance mechanisms. Some of the governance failings of the US - Mexico Framework

⁴ H Fox (ed), *Joint Development of Offshore Oil and Gas* (1990) 1 BIICL.

⁵ Low (n 3) 47, identified four new JDA's in 2012.

⁶ Corruption by Country / Territory, Transparency International <<https://www.transparency.org/country/#RUS>> accessed 3 January 2016

⁷ <http://worldjusticeproject.org/sites/default/files/roli_2015_0.pdf> accessed 3 January 2016

⁸ They are ranked 14th and 5th respectively on Transparency International's corruption perceptions index, Corruption by Country / Territory, Transparency International <<https://www.transparency.org/country/#RUS>> accessed 3 January 2016

Agreement, particularly on the role, composition and decision making powers of the Joint Commission, would also appear to support this. Whilst both countries are experienced in the petroleum sector, the Mexican sector is currently opening up to private investment and has little experience in developing the corresponding legislation and Mexican governance is considered poor.⁹

Considering the precedent JDAs provide, it could also be considered disappointing to see that framework agreements are also developing in an unsystematic non-linear manner. The government objectives when drafting these agreements may be a reason for this. The UK - Norway Framework Agreement had the objective to encourage investment by reducing investment costs via taking advantage of existing infrastructure. This objective gave the legislators clear guidelines on the need to incorporate elements of petroleum conservation. Whilst the resulting Agreement does not meet all of its objectives,¹⁰ it does provide some provisions on use of existing infrastructure and decommissioning. The France - Canada Framework Agreement objective, contained within its explanatory statement, is to promote development of hydrocarbon reserves and their optimal exploitation in an equitable way for the benefit of both parties. This objective incorporates few petroleum conservation principles, which could explain why the Agreement has limited coverage of factors such as sustainability, environmental protection and public participation. The T&T - Venezuela Framework Agreement defines its scope to develop a legal framework for “effective and efficient” development of THRs and the Agreement focuses on unitization provisions with limited attention given to petroleum conservation matters such as environmental provisions. The Iceland - Norway Framework Agreement is similar. Its preamble states its aim is “to maintain and strengthen the good neighbourly relations” and hence neither government contemplated petroleum conservation as a matter of importance for the Framework Agreement; the only mention of petroleum conservation matters is the requirement for the governments to consult on matters of health, safety and the environment.¹¹ Whilst the Norway - Russia Framework Agreement Preamble suggests petroleum conservation objectives

⁹ Mexico is ranked 103rd whilst the US is ranked 17th, *ibid*.

¹⁰ For example, it fails to cover EIAs as was recommended by the 2002 Unlocking Value through Closer Relationships, Report of the UK-Norway Co-operation Workgroup (August 2002).

¹¹ Iceland-Norway Framework Agreement art 3(10).

concerning the “efficient and responsible management of their hydrocarbon resources” and responsibility “for the conservation and rational management of the living resources”, the Agreements’ texts fails to develop these concepts. The Preamble to the US - Mexico Framework Agreement raises considerations of “efficient and equitable exploitation”, “safe, efficient, equitable and environmentally responsible exploitation” and “maximize the long term benefits” which whilst not specific to petroleum conservation opened the door for its inclusion. This opportunity however was not taken.

The principle objective of most States therefore appears to be certainty on unitization and the subsequent resource allocation. This is unsurprising since these factors generate the government revenue and are where political differences are most likely to occur. As the primary objective of the agreements is to develop a reserve in a unified manner, it is imperative that the framework agreements establish a clear and consistent mandatory unitization requirement. In general framework agreements do this, although some allow for convoluted exceptions where the governments agree otherwise or by permitting the governments to limit the area to which a mandatory unitization agreement applies. Whilst such loopholes may initially appear favourable to governments fearful of having to share the rewards from developing a reserve, they create the potential for political tensions, disruptions and delays to the development of THRs. Instead of establishing loopholes within the agreements, a government could simply reduce the area to which a framework agreement applies. This may have been the approach in the US - Mexico Framework Agreement that applies to a narrow path along the border. Whilst this approach provides more certainty and allows for petroleum conservation principles to be applied, it only retains value if the area to which the agreement applies is sufficiently large to cover THRs discoveries. This is clearly a concern in the US - Mexico Framework Agreement.

Missing from many of the framework agreements are clear governance procedures on the unitization process and the associated methodology for determining the reserves and their corresponding allocation. These matters are highly technical and some of the agreements seek the license holders to provide their methodologies for approval. It is unlikely a joint commission will have the required expertise to review the matter, which illustrates the importance of the

commission having subcommittees who can help and advice on such subject matters. Framework agreements' use of technical subcommittees and independent experts where there are failures to reach an agreement, provides the base for solid governance procedures, but would be improved if the framework agreements provided a set of criteria for reviewing the proposals. Some national legislation requires unitization agreements to be equitable, others seek a technical allocation, but none of the existing framework agreements clearly states factors regarding what should be contemplated in the allocation procedure.

Future framework agreements should therefore provide guidelines of the factors to consider during reserve allocation, for example, if an allocation should contemplate an equitable, *in-situ* or migratory view of the resources. The framework agreement should also establish a process involving the license holder as a stakeholder so they are invited to explain and justify their methodologies. The role of the license holders in the process should also be clarified. They are one of the most affected by the decisions taken as it determines the fiscal position of a reserve. Since license holders perform the exploratory work and analysis, they have the greatest understanding of the geophysical characteristics of the reservoir and should provide inputs to the decision-making bodies. Providing the allocation guidelines and involving the license holders to make more informed decisions should provide more certainty on the decision and should limit future disagreements and reallocations.

Petroleum conservation matters generally appear to be a secondary objective. Governments appear to have forgotten how incorporating petroleum conservation factors can reduce not only project costs and hence increase profitability and taxes, but also reduce external costs to society and comply with strengthening international legal principles related to sustainability. There is no doubt by scholars that the ultimate conservation tool is unitization. However a great flaw of the framework agreements is the fact that the migratory nature of hydrocarbons is not fully recognized early in the production life of the reservoir. Further, framework agreements must adapt to the new combined forms of conservation measures such as mandatory pooling and enhanced recovery techniques and technology.

It is unsurprising that the agreements objectives do not refer to public participation and establishing clear rules to encourage investors, as the limited role they play in the framework agreements is disappointing. Framework agreements are growing in use and provide a solid base for developing the principles and practices of petroleum conservation for THRs. For future agreements to deliver on the potential will require governments to be considerate of the importance of conservation from the outset, and set out petroleum conservation as one of the agreements objectives prior to the start of bilateral negotiations.

6.2. Outlook for the Progress of Petroleum Conservation Principles in International Law

Whilst framework agreements are bilateral treaties, much of their background on sustainability and environmental protection is based upon international legal concepts. Most would concur with the guiding principles and the underlying thoughts behind these legal concepts but when it gets to the operational regulation, there is little international advance on developing clear rules and regulations and the associated forms of enforcement. Unfortunately, for the international community to develop an accord on these rules is likely to take decades, as the first legislator moves are often to be found in national laws and industry best practices which framework agreements frequently refer to. Framework agreements, like JDAs, provide a form for some concrete steps to be taken to develop “best of practice” on sustainability, waste prevention and environmental protection *per se*. This is a complex area requiring a strong political effort that would likely require a THR pertaining to two progressive governments with clear sustainability and environmental goals. As a THR refers to a specific location it allows for a framework agreement to consider specific local sustainability and environmental matters. Public pressure to develop THRs is likely to be stronger when the agreement refers to an area the public can relate to. This is more likely to occur for an onshore rather than an offshore development. THRs in sensitive rainforest regions provide the type of area where sustainability, biodiversity and the environment are of high public interest and public pressure could result in forward steps being taken to develop a framework agreement with

petroleum conservation at its core. These areas however tend to be in the developing world where legislators have an excess of priorities which could prevent these developments.

The development of THRs also poses a significant risk to the environment. Exploitation of hydrocarbons contributes greatly to global environmental concerns such as climate change and marine pollution. Often it is difficult to predict which national and international laws, soft laws and guidelines or standards and practices should apply, and to what extent they encourage petroleum conservation principles or just the goal of environmental protection *per se*; a delicate balance extremely difficult to achieve. Framework agreements fail to provide a comprehensive outline of the environmental provisions that their plenary bodies should develop in detail. For the plenary bodies to develop such regulation it is paramount that the framework agreement clearly defines the scope of what these rules are meant to encompass. This failing leaves uncertainty over what environmental values, principles, rules, guidelines, standards and practices apply to THRs and generate potential interpretation problems for the plenary authorities in how they should govern environmental provisions. The development of THRs transcends the particular interests of the States involved. It is not an exaggeration to say that some framework agreements need to be persuaded to deal with resource development holistically, rather than in terms of political boundaries.

In the same way that a group of academics got together to develop a model agreement for joint development,¹² the implementation of a model framework agreement could advance more robust framework agreements. Whilst each existing Framework Agreement identifies the need to minimize environmental impacts of oil and gas operations, the regulatory detail is normally lacking and in the better agreements the plenary body is required to develop the regulations. The Framework Agreements fail to define the scope of what these rules should encompass and hence the plenary authorities are left with the difficult problem of determining their level of authority. The framework agreement mechanism provides a means to clarify this scope and the development of a model framework agreement could provide guidance on this. Each framework agreement could include a section to require petroleum conservation principles be

¹² Fox (n 4).

applied in THRs. Often developing detailed legislation would delay and jeopardize the enactment of a framework agreement and a more practical solution would be for the framework agreement to define the scope and delegate the detailed regulation to a plenary organ, preferably a Joint Commission with Ministerial representatives from both sides in order to give it authority and legitimacy to enact the provisions. The framework agreement could stipulate requirements such as the need for a holistic approach towards petroleum exploitation requiring the Joint Commission, via a subcommittee, to develop a SEA involving public participation for the area covered by the agreement, which provides conclusions covering ICZM and MSP should it cover an offshore area.¹³ The agreement could also stipulate that the Joint Commission determine the requirements of an EIA and its approval procedure, the environmental impact mitigation plan requirements within a development plan, the regulation and oversight of an environmental impact mitigation plan, a range of penalties for non-compliance, etc. As the role of the Joint Commission should cover the oversight of THRs and not the day-to-day operations there is a need to involve specialists in developing each area of the regulations. Subcommittees with area experts should be formed to develop the specific areas of regulations with the Joint Commission providing guidance and approval over the final regulations. In order to ensure these regulations are put in place the agreement needs to include a schedule for forming the sub committees, receiving proposals and reviewing and approving regulation. As there is always a risk that developing the regulations takes longer than expected, there needs to be a means for either extending the schedule or applying more generic rules based upon specific best practice. For example, the generic rules relating to SEAs in the UK, OSPAR or the Baltic could provide a base to establish minimum requirements in the event the schedule of determining rules on a SEA is not complied with. The role of the subcommittee and joint commission in determining the regulations means they would have the knowledge and understanding of the rules for ensuring their enforcement under the agreement. Giving the Joint Commission such a clear responsibility within the framework agreement would help ensure international legal concepts are developed, incorporated and adhered to.

¹³ The cost of the SEA could be recovered from the licensing rounds for the SEA or through the subsequent taxes during the exploitation of the oil and gas.

Providing a wider and clearer scope of authority to a Joint Commission raises the current status of governance within the framework agreements. There is general consensus that good governance encompasses accountability, transparency and rule of law. However this governance experience has typically been poorly integrated into the framework agreements. Each of the framework agreements incorporates some elements of good governance but there is no framework agreement which can be pointed at as a comprehensive example, maybe because many of the framework agreements wordings suggest a government reluctance to delegate authority. There remains a need for future agreements to incorporate more elements of good governance for each process and governing bodies that are established, including public participation procedures.

The apparent governmental fear to delegate authority on matters of sovereignty needs to be overcome in order for the plenary organs of a framework agreement to operate efficiently. Incorporating Ministerial presence on the Joint Commission, the main plenary organ, should be seen as a means to do this since Ministers are usually elected representatives and accountable. The general trend within framework agreements to have a Joint Commission with overall responsibility, technical groups working on specific matters and providing recommendations to Joint Commissions, independent experts providing binding decisions on disputed technical matters and dispute resolution mechanisms to resolve disagreements provides a clear workable decision making process. However, what needs to be incorporated are governance procedures to establish who is on each body, the authority of each body, the decision making process of each body, the identification of who the relevant stakeholders are in each instance, the level of involvement of stakeholders in the processes and a requirement for each body to provide accountability behind its decisions. Clear governance processes would provide governments, investors and society clarity over levels of authority and the decision making process for all aspects related to THRs. As investments in THRs are likely to involve huge sums, long delays in the decision making process could have negative consequences for both investors and governments and a slow decision process during operations could have negative consequences for petroleum conservation measures.

For conflict resolution matters the use of arbitration, as found in the existing framework agreements, should be encouraged. This process allows for the involvement of experts in the decision-making process and offers a speedier resolution than an international court. For existing framework agreements where the plenary bodies have been delegated the responsibility to develop conflict resolution processes it is important they develop this and make it public.

Framework agreements are developing with new agreements being negotiated, making the approach an internationally recognized method of choice for the development of THRs. Six agreements now exist, five which are ratified, in three different continents and a Unitization Agreement for the Loran-Manatee reservoir was executed in 2010, which all provides evidence for the wide acceptance of the concept of the framework agreement. Whilst all current agreements apply to offshore reserves there is no reason why this approach should not be applied onshore and the potential for the application of the approach is vast. With THRs found in many producing regions the need for a mechanism to develop these reserves and generate benefits for all is likely to become more important as traditional areas of exploitation are maturing and declining. Whilst concepts of petroleum conservation are not a prominent feature within existing agreements the framework for raising their prominence exists. It would be wrong to be overly critical of lawmakers for their lack of focus on petroleum conservation and governance matters. It must be remembered that each framework agreement exists for a slightly different purpose and that it has not been the lawmakers' duty or focus to develop the concept of framework agreements to provide a sustainable approach. It would also be harsh to criticize lawmakers for their attempts to provide a clear set of petroleum environmental rules over the development of THRs when in practice many national environmental laws are lacking in clarity and, as the Macondo incident in the US Gulf Coast showed, existing regulations are often inadequate to cover the rapid technological advances of the petroleum sector and its risks. Existing framework agreements provide a base for developing a comprehensive solution to the complex problem of THRs. Their use of plenary organs to develop the detailed rules allows for their improvement to further incorporate petroleum conservation measures, which should be encouraged. Not only will this promote sustainability

principles, but also provide guidance for how to raise the importance of petroleum conservation in future agreements.

Sustainability provisions relating to marine protection, climate, energy efficiency and public participation provide an opportunity to revisit framework agreements. Current trends in sustainability must not be ignored. Sustainable principles now play a fundamental role in the formulation of petroleum laws. Petroleum conservation involves a balancing of present development against the preservation of resources for the future, principles that apply locally and internationally. The overall achievement of sustainable development provides an ongoing challenge for petroleum conservation laws. The identification of the most appropriate ownership framework influences to great extends its conservation. Despite national laws enforcing compulsory unitization, under international law the problem remains. Under international law States are not obliged to conservation measures such as mandatory unitization.¹⁴ From the comparison with conservation measures adopted under national laws it can be concluded that it is not possible to construct a similar obligation under international law, especially when the rights and obligations of States under national laws do not have their equivalent at an international level. While under petroleum national laws States may impose detailed conservation measures, in international law and particularly in the law of the sea there is no rule requiring States to adopt similar measures for THRs. The analysis demonstrates that States' discretionary powers to define the structure and legal framework applicable to THRs have resulted in significant disparity between the agreements executed thus far. Framework Agreements are the result of an economic venture that exclusively takes into account State's discretion to undertake exploration and exploitation activities of THRs. They are not a result of an international obligation requiring States to develop THRs under conservation principles.

¹⁴ Arguing that a rule of customary law requiring States to unitize shared deposits is emerging includes William Onorato; those expressing scepticism include Masahiro Miyoshi and Peter Cameron, suggesting that international law provide States with rules of engagement rather than rules of cooperation. Rainer Lagoni and David Ong conceded in the benefits of unitization, but are still reluctant to accept that there is a duty to conclude a unitization agreement. See N Bankes, 'Recent Framework Agreements for the Recognition and Development of Transboundary Hydrocarbon Resources' (2014) 29 IJMCL 666, 671.

There is a clear trend towards addressing shared natural resources in a holistic, rather than piecemeal, manner. The recommendations prepared by the ILA and the ILC on international watercourses and groundwater reveal a general support for universal rules. There is no reason why universal rules should not be applicable to THR. Oil has become the world's single most important commodity, and its political and economic effects can be pervasive. To some States THR represent their only source to hydrocarbons. The codification of universal rules will not disturb the balance found under the law of the sea. To provide common recommendations at a minimum, will complement conservation principles already found in UNCLOS. The interpretation of sustainability principles by international courts and the further incorporation of conservation measures in national laws will provide a more progressive conservation framework for THR.¹⁵

Any codification efforts would strengthen sustainable development principles, and evidence a respect to human rights and the environment, contribute to the maintenance of international peace, as well as the optimal use of such resources for the benefit of humankind. Framework agreements provide a unique opportunity to pursue the equal and equitable sharing of resources, take into consideration the needs of developing States to reduce the economic disparity between States, adopt a holistic approach towards the protection of marine resources, with special concern with the protection of collective interests and be implemented for the benefit of mankind. The consolidation of sustainable development in international law provides a unique opportunity to see THR with fresh eyes, with a more cosmopolitan approach in favour of nature and humanity as a whole.¹⁶ Petroleum conservation should not be left out of the broader international discussions on sustainability. Nations wealth is intertwined with shared geology, peoples and nature.

¹⁵ The ICJ has observed that in the absence of pertinent customary or conventional rules, direct reference should be made to the relevant general principles derived from municipal laws. *Barcelona Traction, Light & Power Co. (Belg. v Spain)*; Second Phase Judgment (5th February 1970) ICJ Report 1970 paras 33, 77.

¹⁶ Kants' 'Perpetual Peace' is a keen defense of cosmopolitan values. M Nussbaum, 'Kant and Cosmopolitanism' in Brown G and Held D (eds), *The Cosmopolitanism Reader* (Policy Press 2010) 28. "The idea of cosmopolitan law introduced by Kant in his essay 'Perpetual Peace' – has been brought back into fashion in an attempt to seek a legal framework for the demand for a generalized enforcement of HR" and to extend its scope to cover environmental matters. D Archibugi, 'The Architecture of Cosmopolitan Democracy' in Brown G and Held D (eds), *The Cosmopolitanism Reader* (Polity Press 2010) 328. Also see, for example, P Hayden, 'The Environment, Global Justice and World Environmental Citizenship' in Brown G and Held D (eds), *The Cosmopolitanism Reader* (Policy Press 2010) 370.

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