CIVIL LIABILITY AND COMPENSATION FOR OIL POLLUTION DAMAGE RESULTING FROM OFFSHORE OIL EXPLORATION AND EXPLOITATION*

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ABSTRACT

Technological advancement and the increase in the demand for petroleum products will increase the possibility of incidents involving offshore oil exploration and exploitation in Thailand, leading to rising of marine oil pollution damage from such activities which is normally massive and has substantial impact upon marine environment and relevant natural resources. In this regard, appropriate civil liability and compensation regime is acceptable as one useful mechanism to recoup the damage and restore the damaged natural resources to their baseline.

Thai law recognizes civil liability and compensation regime for natural resource damages caused by oil pollution from offshore oil exploration and exploitation and natural resource damages acceptable. However the compensation is still, in practice, not effectively and efficiently enforceable in Thailand due to the problem on quantification of natural resource damages. This problem is also an obstacle for court to award reasonable and fair compensation for natural resource damages.

This article aims at studying on the US law and Thai law relating to civil liability and compensation for natural resource damages caused by oil pollution resulting from offshore oil exploration and exploitation to analyze relevant problems and to seek solutions to make compensation for natural resource damages for such case more practical, effectively and efficiently in Thailand. In conclusion, this thesis proposes that the responsible governmental authority in charge for natural resource damage assessment (NRDA) and establishment of a claim against the offshore oil operator should be designated and NRDA regulations providing the NRDA process as well as the economic criteria and methods utilized to assess the natural resource damages caused by oil pollution from offshore oil exploration and exploitation should be established. For the court's standard practice to quantify natural resource damages, the President of the Supreme Court should issue the guideline for the court to award compensation in this case. Moreover, the Enhancement and Conservation of National Environmental Quality Act B.E. 2535 should be amended to add financial security and a fund scheme against the offshore oil operator to ensure the payment of compensation for natural resources.

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บทคัดย่อ

ความก้าวหน้าทางเทคโนโลยีและความต้องการผลิตภัณฑ์ปิโตรเลียมที่เพิ่มขึ้นทำให้มีความเป็นไปได้ที่จะเกิดอุบัติการณ์เกี่ยวกับการสำรวจและแสวงหาประโยชน์จากน้ำมันนอกชายฝั่งในประเทศไทยเพิ่มขึ้น และนำไปสู่ปัญหาความเสียหายจากมลพิษน้ำมันทางทะเลที่เกิดจากกิจกรรมดังกล่าวมากขึ้น ซึ่งโดยปกติมักเป็นความเสียหายอย่างใหญ่หลวงและมีผลกระทบต่อสภาพแวดล้อมทางทะเลและทรัพยากรธรรมชาติที่เกี่ยวข้องเป็นอย่างมาก ระบบความรับผิดทางแพ่งและการชดใช้ค่าเสียหายที่เหมาะสมเป็นที่ยอมรับว่าเป็นกลไกหนึ่งที่มีประโยชน์ที่จะช่วยชดใช้ความเสียหายและฟื้นฟูทรัพยากรทางธรรมชาติให้กลับสู่สถานะเดิมได้

กฎหมายไทยยอมรับให้มีการชดใช้ค่าเสียหายต่อทรัพยากรธรรมชาติที่เกิดจากมลพิษน้ำมันอันเป็นผลมาจากการสำรวจและแสวงหาประโยชน์จากน้ำมันนอกชายฝั่ง อย่างไรก็ตาม การชดใช้ค่าเสียหายดังกล่าวในประเทศไทยยังไม่สามารถบังคับใช้ได้อย่างมีประสิทธิภาพและมีประสิทธิผลในทางปฏิบัติเนื่องจากมีปัญหาเกี่ยวกับการประเมินความเสียหายต่อทรัพยากรธรรมชาติ และปัญหานี้ยังเป็นอุปสรรคสำหรับศาลไทยในการวินิจฉัยชี้ขาดและกำหนดค่าเสียหายต่อทรัพยากรธรรมชาติที่เหมาะสมและเป็นธรรมอีกด้วย

บทความนี้มุ่งศึกษากฎหมายของประเทศสหรัฐอเมริกาและกฎหมายไทยที่เกี่ยวกับความรับผิดทางแพ่งและการชดใช้ค่าเสียหายต่อทรัพยากรธรรมชาติที่เกิดจากมลพิษน้ำมันซึ่งเป็นผลมาจากการสำรวจและแสวงหาประโยชน์จากน้ำมันนอกชายฝั่ง เพื่อวิเคราะห์ปัญหาที่เกี่ยวข้องและวิธีการแก้ไขปัญหาเพื่อให้การชดใช้ค่าเสียหายต่อทรัพยากรธรรมชาติในกรณีดังกล่าวในประเทศไทยเป็นไปได้ในทางปฏิบัติและมีผลบังคับใช้ได้อย่างมีประสิทธิภาพ โดยสรุป วิทยานิพนธ์ฉบับนี้เสนอให้แต่งตั้งหน่วยงานรัฐที่รับผิดชอบในการประเมินความเสียหายต่อทรัพยากรธรรมชาติและดำเนินคดีต่อผู้ประกอบการสำรวจและแสวงหาประโยชน์จากน้ำมันนอกชายฝั่งในกรณีดังกล่าวและให้มีการออกหลักเกณฑ์การประเมินความเสียหายต่อทรัพยากรธรรมชาติเพื่อกำหนดขั้นตอนในการประเมินความเสียหายรวมถึงหลักเกณฑ์และวิธีการที่ใช้ในการประเมินความเสียหายต่อทรัพยากรธรรมชาติที่เกิดจากมลพิษน้ำมันอันเนื่องมาจากการสำรวจและแสวงหาประโยชน์จากน้ำมันนอกชายฝั่ง ในทางศาลประธานศาลฎีกาควรออกข้อกำหนดเกี่ยวกับหลักเกณฑ์และวิธีการที่ศาลจะใช้ในการพิจารณากำหนดค่าเสียหายต่อทรัพยากรธรรมชาติเพื่อให้การวินิจฉัยของศาลในกรณีดังกล่าวเป็นมาตรฐานเดียวกันในทางปฏิบัติ นอกจากนี้ ควรมีการแก้ไขพระราชบัญญัติส่งเสริมและรักษาคุณภาพสิ่งแวดล้อมแห่งชาติ พ.ศ. 2535 เพิ่มเติมให้ผู้ประกอบการสำรวจและแสวงหาประโยชน์จากน้ำมันนอกชายฝั่งมีหน้าที่ต้องวางหลักประกันทางการเงิน รวมทั้งให้มีการจัดตั้งกองทุนเพื่อเป็นหลักประกันในการชดใช้ค่าเสียหายต่อทรัพยากรธรรมชาติด้วย

คำสำคัญ: ความเสียหายจากมลพิษน้ำมัน, ความเสียหายต่อทรัพยากรธรรมชาติทางทะเล, การสำรวจและแสวงหาประโยชน์จากน้ำมันนอกชายฝั่ง, การประเมินความเสียหายต่อทรัพยากรธรรมชาติ

Introduction

There are a number of offshore oil exploration and exploitation operations conducted in the marine area of Thailand. Such operations are regarded as a high-risk activity that presents constant risk of oil pollution which would cause massive damage upon marine environment and natural resources. Primary environmental law dealing with civil liability and compensation for natural resource damages caused by oil pollution resulting from offshore oil exploration and exploitation in Thailand is the Enhancement and Conservation of National

Environmental Quality Act B.E. 2535. Compensation for natural resource damage in such a case is admitted as compensable under such Act. However, a practical problem still arises as to how to quantify such natural resource damages to reasonably and appropriately remedy the damage and restoration of the damaged natural resources because the criteria and methods for natural resource damage assessment in such a case have never been established under relevant laws. This also impedes court's consideration in awarding compensation for the injured natural resources. Therefore, relevant laws should be developed regarding the determination of criteria and methods for quantification of damages to natural resources.

In the US, civil liability and compensation regime for natural resource damages caused by oil pollution from offshore oil exploration and exploitation has been well established, as provided in Oil Pollution Act of 1990 (OPA). This article therefore aims at studying the US law and Thai law relating to civil liability and compensation for natural resource damages caused by oil pollution resulting from offshore oil exploration and exploitation to analyze relevant problems and to seek solutions to make compensation for natural resource damages for such case more practical, effectively and efficiently in Thailand.

To seek practical, effectively and efficiently compensation for natural resource damages caused by oil pollution resulting from offshore oil exploration and exploitation, the concepts of civil liability and compensation for natural resources damages, civil liability and compensation for natural resource damages caused by oil pollution from offshore oil exploration and exploitation in the US and problems concerning compensation for natural resource damages caused by oil pollution from offshore oil exploration and exploitation in Thailand will be respectively addressed herein.

1. The Concepts of Civil Liability and Compensation for Natural Resource Damages

To understand the concepts of civil liability and compensation for natural resource damages, it is essential to comprehend environmental principles relating to civil liability and compensation for natural resource damages as well as economic aspects of natural resources for quantification of natural resource damage.

1.1 Environmental Principles Relating to Civil Liability and Compensation for Natural Resource Damages

Environmental principles relating to civil liability and compensation for natural resource damages are "the public trust doctrine", "strict liability principle" and "polluter pays principle".

The public trust doctrine bas been traditionally used by courts in the United States to protect public interests in navigable waters, submerged lands, and the shores of navigable

waterways.[1] The public trust doctrine provides that natural resources are held in trust by the government for the benefit of the people and the government is regarded as trustee of resources.[2] Accordingly, damage to those natural resources is also deemed damage to the public's interest.

Strict liability is grounded on the concept that damage occurred shall be compensated and remedied regardless of intention or negligence of the actor. Under strict liability principle, the accused is assumed liability and shall be responsible for damage. To discharge from the assumed liability, the defendant or the accused shall have to prove that his action falls into exemptions provided by law.[3]

The "polluter pays principle" was first endorsed by the Organizations for Economic Co-operation and Development (OECD) in the 1970s. As defined by the OECD, the principle entailed that the polluter should bear the expense of carrying out measures decided by public authorities to ensure that the environment is in an acceptable state and that the cost of these measures should be reflected in the cost of goods and services which cause pollution in production and or in consumption.[4]

1.2 Economic Aspects of Natural Resources

Civil liability and compensation regime for natural resource damages is set for remediation and restoration of the damaged resources. In order to achieve so, natural resource damage assessment must be taken into consideration and an actual value of such injured natural resources is necessary to be known therefor. Accordingly, monetary values of the damaged natural resources shall be determined and as such economics is directly and unavoidably involved.

Valuing natural resources is difficult and challenging to estimate because most natural resources and their services do not have a market value. Despite the fact that no market price exists for natural resources, it is obviously appeared that individuals attach a certain value to natural resources and their services. Valuation of natural resources which are nonmarket products or services is therefore to assign monetary value to them regardless of whether they can be traded in the market or have a market price or not.[5]

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[1] James J. Lawler & William M. Parle, *Expansion of the Public Trust Doctrine in Environmental Law: An Examination of Judicial Policy Making by State Courts*, 70 **Social Science Quarterly**, 134, 135 (March 1989), *available at* http://eds.a.ebscohost.com/eds/pdfviewer/pdfviewer?sid=a027d724-26ec-4369-9224-e4a2b5e8fa86%40sessionmgr4003&vid=0&hid=4102

[2] *Id.*

[3] อุดมศักดิ์ สินธิพงษ์, *กฎหมายเกี่ยวกับสิ่งแวดล้อม29* (กรุงเทพมหานคร: พิมพ์ครั้งที่ 4สำนักพิมพ์วิญญูชน2556).(UdomsakSinthipong, *Environmental Law* 29 (Bangkok: 4th ed. Winyuchon Publication House 2013)).

[4] Patricia Birnie&Alan Boyle, International Law &The Environment 92 (2nd ed., Oxford University Press2002).

[5] Economic Assessment of Natural Resource Damages, http://www.exponent.com/economic_assessment_of_natural_resource_damages_3/(last visited Jun. 3, 2015).

Within non-market values, economic value of natural resources comprises of three main elements which are use value, non-use value, and option value.Use values are those associated with tangible uses of natural resources, such as recreational benefits.[6] Non-use value captures those elements of value that are unrelated to a current, future, or potential use.[7]Natural resources may also be valued for their potential to be available in the future. These potential future benefits constitute an option value.

1.2.1 Economic Methods for Valuation of Natural Resources

In order to measure the value of natural resources, economic methods are required. Valuation methods are usually divided into five approaches below.

1.2.1.1 Direct Market Valuation Approaches

(1) Market Price-Based Approach

Market price-based approaches are most often used to obtain the value of provisioning natural resource services, since the commodities produced by provisioning services are often sold on, e.g., fisheries, seafood markets. In well-functioning markets preferences and marginal cost of production are reflected in a market price, which implies that these can be taken as accurate information on the value of commodities. The price of a commodity times the marginal product of the ecosystem service is an indicator of the value of the service, consequently, market prices can also be good indicators of the value of the natural resource service that is being studied.[8]

(2) Cost-Based Approaches

Cost-based approaches are based on estimations of the costs that would be incurred if natural resource benefits needed to be recreated through artificial means.[9] The approaches assume that the costs of avoiding damages or replacing natural resources or their services provide useful estimates of the value of these resources or services. This is based on the assumption that, if people incur costs to avoid damages caused by lost marine resources and services, or to replace the resources and services, then those services must be worth at least what people paid to replace them. Thus, the methods are most appropriately applied in cases

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[6]James R. Kahn, The Economic Approach to Environmental and Natural Resources 87 (Harcourt Brace & Company 1995).

[7]Dominika Dziegielewska&Tom Tietenberg, Total Economic Value (Oct. 13, 2013), http://www.eoearth.org/view/article/51cbef167896bb431f69c4b5/ (last visited 5 June 2015).

[8]Luke Brander, Erik Gómez-Baggethun, Berta Martín-López, MadhuVerma et al, Chapter 5 The economics of valuing ecosystem services and biodiversity 17 (March2010), http://www.teebweb.org/wp-content/uploads/2013/04/D0-Chapter-5-The-economics-of-valuing-ecosystem-services-and-biodiversity.pdf (last visited Jun. 7, 2015).

[9]*Id.*

where damage avoidance or replacement expenditures have actually been, or will actually be, made.[10]

(3) Production Function-Based Approach (PF)

Production function-based approach is based on the fact that many natural resources, processes and qualities are used as production factors. The PF method tries to value natural qualities by valuing their impacts on production costs. The PF approach generally consists of two-step procedure. The first step is to determine the physical effects of changes in a biological resource or ecosystem service on an economic activity. In the second step, the impact of these changes is valued in terms of the corresponding change in marketed output of the traded activity.[11]

1.2.1.2 Revealed Preference Approaches

(1) The Travel Cost Method (TCM)

The travel cost method is, in general, employed to estimate recreational values. This technique assumes that visitors to a particular site incur economic costs, in the form of outlays of time and travel expenses, to visit the site.[12] The TCM assumes that the demand for trips to a specific site is dependent on travel costs, income, characteristics of the site, prices of substitutes, etc. In order to determine the willingness to pay of visitors from various distances, distance circles are drawn in the service area of a site. The percentage of inhabitants of each circle that will visit the site at a fixed amount of travel cost per circle is determined by means of a survey.[13]

(2)The Hedonic Pricing Method (HPM)

Hedonic pricing method tries to measure the value of a non-marketed natural resources and service as a measurable component (‘attribute’ or ‘characteristic’) of a marketed good. The most common applications of HPM try to exploit the relationship between property values - often, although not exclusively, residential property values- and environmental attributes of the neighbourhood (e.g. air quality, noise levels, access to

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[10] Dennis M. King &Marisa J. Mazzotta, Damage Cost Avoided, Replacement Cost and Substitute Cost Methods, http://www.ecosystemvaluation.org/cost_avoided.htm (last visited Jun. 7, 2015).

[11]Brander, Gómez-Baggethun, Martín-López, Verma et al, *supra* note 8.

[12]Memorandum from the Department of Energy on Natural Resource Valuation: A Primer on Concepts and Techniques to EH-41 Web Site Users, Appendix A (Oct. 6, 1997), *available at* http://www.environmentalmanager.org/wp-content/uploads/2008/04/valuation_primer_from_doe.pdf.

[13]Overview of Economic Valuation Methods, https://www.google.co.th/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CBwQFjAAahUKEwjmn9ucy4fHAhVBH44KHVTmCNM&url=http%3A%2F%2Fwww.fsd.nl%2Fdownloadattachment%2F73222%2F59929%2Feconomic%2520valuation%2520methods.pdf&ei=oJO8VebPCsG-uATUzKOYDQ&usg=AFQjCNHcLEH8TUxF0NCGSZI_TbxTJoO7Lw&sig2=ATNUKi_kHFMUasT2Hwl1vg (last visited June. 7, 2015).

recreational facilities, visual amenities).[14]If data are readily available, it can be relatively inexpensive to apply. However, if data must be gathered and compiled, the cost of an application can increase substantially.[15]

1.2.1.3 Stated Preference Approaches

(1) Contingent Valuation Method (CVM)

The CVM is a survey or questionnaire-based approach to the valuation of non-market goods and services. The values obtained for the good or service are said to be contingent upon the nature of the constructed (hypothetical or simulated) market and the good or service described in the survey scenario. CVM has great flexibility, allowing valuation of a wider variety of non-market goods and services. It is, in fact, the only method currently available for estimating non-use values. In natural resources, contingent valuation studies generally derive values through the elicitation of respondents' willingness to pay to prevent injuries to natural resources or to restore injured natural resources, or alternatively, willingness to accept for loss or degradation of natural resources.[16]

(2) Choice Modeling (CM)

CM is a family of survey-based methodologies for modeling preferences for goods, where goods are described in terms of their attributes and of the levels that these take. Respondents are presented with various alternative descriptions of a good, differentiated by their attributes and levels, and are asked to rank the various alternatives, to rate them or to choose their most preferred. By including price/cost as one of the attributes of the good, willing to pay can be indirectly recovered from people's rankings, ratings or choices. As with contingent valuation, CM can also measure all forms of value including non-use values.[17]

(3) Conjoint Analysis[18]

Conjoint analysis is the valuation method that is used to determine specific preferences between different levels of characteristics of an ecosystem attribute. It allows individuals to choose between two hypothetical environments based on a list of characteristics that distinguish them from each other based on a ranking system of each

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[14]CesareDosi, Environment and Human Settlements Division, Santiago, Chile, *Environmental Values, Valuation Methods, and Natural Disaster Damage Assessment,* 6 (June 2001), *available at* http://repositorio.cepal.org/bitstream/handle/11362/5722/S01050460_en.pdf?sequence=1

[15]Dennis M. King &Marisa J. Mazzotta, Hedonic Pricing Method, http://www.ecosystemvaluation.org/hedonic_pricing.htm (last visited Jun. 7, 2015).

[16]National Oceanic and Atmospheric Administration of the U.S. Department of Commerce, *Economic Valuation of Natural Resources: A Handbook for CoastalResource Policymakers*, NOAA Coastal Ocean Program Decision Analysis Series No. 5, 50 (1995), *available at* http://docs.lib.noaa.gov/noaa_documents/NOS/NCCOS/COP/DAS/DAS_5.pdf

[17] Nick Hanley, Susana Mourato& Robert E. Wright, *Choice Modeling Approaches: A Superior Alternative for Environmental Valuation?*, 15 **Journal of Economic Surveys** 435, 436 (2001), *available at* http://onlinelibrary.wiley.com/doi/10.1111/1467-6419.00145/pdf.

[18]Rebecca M. Carson & John C. Bergstrom, A Review of Ecosystem Valuation Techniques (December 2003), http://ageconsearch.umn.edu/bitstream/16651/1/fs0303.pdf (last visited Jun. 7, 2015)

attribute. This method allows for the researchers to see which of the two choices teach respondent prefers, and it shows which characteristics they value the most. The respondent would choose which choice he or she preferred along with a ranking of the attributes that led to the decision of preference.

1.2.1.4 Benefit Transfer Approach

Benefit transfer is the process of taking an existing value estimate and transferring it to a new application that is different from the original one.[19]The basic goal of benefit transfer is to estimate benefits for one context by adapting an estimate of benefits from some other context. Benefit transfer is often used when it is too expensive and/or there is too little time available to conduct an original valuation study, yet some measure of benefits is needed. The benefit transfer method is most reliable when the original site and the study site are very similar in terms of factors such as quality, location, and population characteristics; when the environmental change is very similar for the two sites; and when the original valuation study was carefully conducted and used sound valuation techniques.[20]

1.2.1.5 Habitat Equivalency Analysis (HEA)

Habitat equivalency analysis (HEA) is a methodology used to determine compensation for resource injuries such as discharges of oil. It is not the methodology directly valuing natural resources; instead it focuses on the replacement or the compensation for the affected or damaged habitat. The principal concept underlying the method is that the public can be compensated for past losses of habitat resources through habitat replacement projects providing additional resources of the same type. However, the HEA method is not appropriate for standard benefit-cost analysis, where the goal is to determine optimal (efficient) allocation of scarce resources.[21]

2. Civil Liability and Compensation for Natural Resource Damages Caused by Oil Pollution from Offshore Oil Exploration and Exploitation in the US

In the US, civil liability and compensation regime for natural resource damages caused by oil pollution from offshore oil exploration and exploitation has been well established, as provided in Oil Pollution Act of 1990 (OPA). The goal of OPA is to make the environment and public whole for injuries to natural resources and services resulting from an incident involving a discharge or substantial threat of a discharge of oil (incident). This goal is achieved through the return of the injured natural resources and services to baseline and

[19]National Research Council of the National Academies, Valuing Ecosystem Services: Toward Better Environmental Decision-Making 124 (The National Academies Press 2005), *available at*http://download.nap.edu/cart/download.cgi?&record_id=11139.
[20]Dennis M. King, and Marisa J. Mazzotta, Benefit Transfer Method, http://www.ecosystemvaluation.org/benefit_transfer.htm (last visited Jun. 7, 2015).
[21]Science Advisory Board of the U.S. Environmental Protection Agency, Habitat Equivalency Analysis, http://yosemite.epa.gov/Sab/Sabproduct.nsf/WebFiles/HEA/$File/HEA-03-09-09.pdf (last visited Jun. 7, 2015).

compensation for interim losses of such natural resources and services from the date of the incident until recovery. The purpose of NRDA regulations is therefore to promote expeditious and cost-effective restoration of natural resources and services injured as a result of an incident.

OPA provides three factors for measuring natural resource damages. The first allows for the cost of restoring, rehabilitating, replacing, oracquiring the equivalent of, the damaged natural resources. The second considers the diminution in value of those natural resources pending restoration. And the third allows for recovery of the reasonable costs incurred in assessing those damages. National Oceanic and Atmospheric Administration (NOAA) is assigned as a public trustee to assess natural resource damages, as well as to develop and implement a plan for the restoration, rehabilitation, replacement, or acquisition of the equivalent, of the natural resources under their trusteeship.

With regard to methodology for valuing natural resource damages, the current emphasis of NOAA is on restoration rather than a monetized estimate of lost value as the measure of damage. Technical feasibility and cost-effectiveness must be considered in the choice of restoration projects. The advantage of restoration is that, by definition, both lost use[22] and non-use[23] value are eventually restored. However, monetization is not prohibited but is rarely favored.

3. Problems Concerning Compensation for Natural Resource Damages Caused by Oil Pollution from Offshore Oil Exploration and Exploitation in Thailand

From the study on civil liability and compensation for natural resource damages caused by oil pollution resulting from offshore oil exploration and exploitation under relevant Thai laws, problems concerning compensation for such damages are found below.

3.1 No Designation of Responsible Government Authority

From the study on Petroleum Act B.E. 2514 and Enhancement and Conservation of National Environmental Quality Act B.E. 2535, no government authority is designated as the responsible party in charge for marine natural resource damage assessment in case of oil pollution resulting from offshore oil exploration and exploitation.

As the government authority to claim for natural resource damages on behalf of State will play critical in assessing and valuing natural resource damages, lack of designation of such responsible government authority will impede the pursuit for compensation for natural resource damages. Further, it may result in overlapping duty among relevant government authorities and double recovery charged on the responsible party. Therefore, responsible government authority in charge for quantification of natural resource damages caused by oil

[22]Use values are those associated with tangible uses of natural resources, both direct use and indirect use, such as recreational benefits.

[23]Non-use value captures those elements of value that are unrelated to a current, future, or potential use.

pollution resulting from offshore oil exploration and exploitation and making a claim therefor against the responsible party is necessary.

In the US, under OPA, the function of the trustees is to assess natural resource damages, as well as to develop and implement a plan for the restoration, rehabilitation, replacement, or acquisition of the equivalent, of the natural resources under their trusteeship. Accordingly, they are charged with acting on behalf of the public. The National Oceanic and Atmosphere Administration (NOAA) is assigned to act as a public trustee for natural resource damages caused by oil pollution from offshore oil exploration and exploitation's facility.

3.2 Absence of Criteria and Methods Rule for Quantification of Natural Resource Damages

In order for successful compensation for natural resource damages caused by oil pollution from offshore exploration and exploitation, quantification for such damage is necessary. Accordingly, value of the damaged natural resources as well as natural resource damage assessment must be explored.

Section 97 of the Enhancement and Conservation of National Environmental Quality Act B.E. 2535 of Thailand provides civil liability and compensation for natural resource damages in that any person who commits an unlawful act or omission by whatever means resulting in the destruction, loss or damage to natural resources owned by the State or belonging to the public domain shall be liable to make compensation to the State representing the total value of natural resources so destroyed, lost or damaged by such an unlawful act or omission. However, criteria and methods for valuation of the natural resource value and natural resource damage assessment have never been created in Thailand so far.

Natural resource damage assessment (NRDA) is a critical process to quantify damage and seek compensation for natural resource damages as it is the way to prove the loss to natural resources and the monetary damage. Without the NRDA, claim for natural resource damages caused by oil pollution from offshore exploration and exploitation cannot be established and compensation cannot be awarded. This is an obstacle for State to establish the claim for natural resource damages and for courts to award compensation for natural resource damages in practice.

Under the OPA, NRDA Regulations are developed by NOAA. The Regulations focus on remedy of natural resource damages by returning injured natural resources and services to the condition they would have been in if the incident had not occurred (baseline conditions), and compensating for interim losses from the date of the incident until recovery of such natural resources and services through the restoration, rehabilitation, replacement, or acquisition of equivalent natural resources and/or services. The Regulations provides various approaches and economic methods for scaling and choosing the most appropriate and cost-effective restoration actions. This brings about the advancement and easement of the US's NRDA and also present distinctive elements of US maritime pollution law that are most worthy of emulation by other countries.

3.3 Court's Difficulty in Quantification of Natural Resource Damages

Without criteria and methods for quantification of natural resource damages caused by oil pollution from offshore oil exploration and exploitation, court is likely to employ wrongful act provisions regarding compensation provided in Civil and Commercial Code for quantification of natural resource damages. Awarding compensation based on Civil and Commercial Code is not appropriate to natural resource damages case because wrongful act provisions focus on remediation for injury to private's life, body, health, liberty, property while compensation for natural resource damages focuses on remediation for public and social's benefits or, in other words, it is to make the environment and public whole.Accordingly, quantification of damage for injured natural resources needs to take into account of their total economic value[24]which can be calculated by employing economic theory. Accordingly, remediation of natural resource damages is nearly impossible and the reasonable compensation for natural resource damages in corresponding to economic theory has never been awarded by the court.

Another obstacle for court to quantify reasonable natural resource damages is about introduction of relevant evidences. Introduction of evidences in civil court rather trends to adversarial system in that the court is normally neutral and let the introduction of evidences conducted mostly by litigants and lawyers. In case of natural resource damages caused by oil pollution resulting from offshore oil exploration and exploitation, expert witnesses for marine natural resources, oil pollution damage, economic value of natural resources and other related issues are necessarily required to present accountable and reliable facts before the court for court to reasonably quantify damage. Accordingly, court should have their own discretion to appoint the expert witnesses. Adversarial system may impede the court in seeking sufficient and unprejudiced facts for reasonable and fair quantification of natural resource damages.

Due to court's difficulty in quantification of natural resource damages as mentioned above, efficient remediation and restoration of the damaged natural resource is nearly impossible resulting in failure to achieve the purpose of environmental law in protection and conservation of environment.

3.4 Enforcement upon Compensation Payment

Damage to natural resources caused by oil pollution resulting from offshore oil exploration and exploitation is normally massive, thereby possibly causing the operator of offshore oil exploration and exploitation bankrupted or insolvent. Moreover, most offshore oil operators are transnational entities. Due to the bankruptcy, insolvency or sheltering of assets overseas of the offshore oil operator, compensation for natural resource damages is

[24]Total economic value of natural resource comprises of three main elements which are use value, non-use value, and option value. Use values are those associated with tangible uses of natural resources, both direct use and indirect use, such as recreational benefits. Non-use value captures those elements of value that are unrelated to a current, future, or potential use. Natural resources may also be valued for their potential to be available in the future. These potential future benefits constitute an option value.

likely not to be collected by State and the restoration of damaged natural resources will not be accomplished.

According to Petroleum Act B.E. 2514 and the Enhancement and Conservation of National Environment Quality Act B.E. 2535, no any provision requires the offshore oil operator or the polluter to provide financial security to guarantee the compensation for natural resource damages. Although voluntary environmental insurance is available, it is likely unfavorable for offshore oil operator due to high amount of premium.

In connection with a fund, although the Environmental Fund is established under the Enhancement and Conservation of National Environmental Quality Act B.E. 2535, functions of such Fund do not deal with expenses for clean-up cost, remedial activities or compensation for natural resource damages, but to support activity which enhances and conserves environment.[25]

Without financial security and a fund system established for compensation of natural resource damages, compensation for natural resource damages awarded by the court may be unenforceable in practice, particularly in case of defendant's bankruptcy, insolvency or prior dissolution.

Conclusion and Recommendations

From the study, natural resource damages caused by oil pollution from offshore exploration and exploitation cannot be compensated and restored effectively and efficiently, in practice,in Thailand due to the absence of criteria and methods for quantification of natural resource damages.The Ministry of Natural Resources and Environment should promulgate the ministerial regulation by virtue of Sections 96 and 97 of the Enhancement and Conservation of National Environmental Quality Act B.E. 2535 to designate the Department of Marine and Coastal Resources as the primary government authorities and an NRDA committee in charge for natural resource damage assessment (NRDA) and establishment of a claim against the offshore oil operator. Further, the Department of Marine and Coastal Resources should promulgate the Department's NRDA regulations providing the NRDA process as well as the economic criteria and methods utilized to assess the natural resource damages caused by oil pollution resulting from offshore oil exploration and exploitation. With reference to court's difficulty in quantification of natural resource damages, the President of the Supreme Court should issue the guideline for the court to award compensation for the court's standard practices. Moreover, the Enhancement and Conservation of National Environmental Quality Act B.E. 2535 should be amended to add financial security and a fund scheme against the offshore oil operator to ensure the payment of compensation for natural resources.

[25] Enhancement and Conservation of the National Environmental Quality Act B.E. 2535, Section 25.

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Other Materials

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