International Legal Framework Governing Artificial Reefs, with a Review of Iran's Regulations

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ARTICLE INFO

Keywords:

Artificial reefs, Decommissioning, Marine environment, Oil and gas installations

DOI: 10.22050/pbr.2020.254721.1131

Received: 27 October 2020
Revised: 19 November 2020
Accepted: 25 November 2020

ABSTRACT

Converting unused offshore oil and gas installations into artificial reefs as one of the alternative methods of decommissioning, is used in many coastal states across the globe for the purposes of coastal management, enhancement and attraction of living marine resources, protection and preservation goals. Despite the positive impacts of artificial reefs, there are also potential negative impacts which require adequate maintenance of assets as well as, continuing monitoring and supervising. Although a lot of countries have comprehensive regulation on artificial reefs, many nations have blanket regulation requiring obsolete structures to be removed, yet it can bring about enormous environmental, socio-economic benefits. The sensitivity of deployment of structures as artificial reefs induced international and regional conventions to intervene and regulate the matter. The aim of this paper is to compare the most important international and regional conventions and critically compare and analysis them with the current Iran's national laws and regulations. Iran is one of the biggest oil and gas producers and has a huge number of offshore installations which will require decommissioning in the coming years. Therefore, comprehensive national regulation should be enacted on decommissioning and also the possibility of creation artificial reefs. The authors seek out to evaluate the existing legislation in order to assess the potential capacity of Iran's seas for converting the installations into artificial reefs.

1. Introduction

The offshore asset life cycle begins with issuing an exploration authorisation (Hammerson, 2016). Provided that it is proved the reservoir production will be economic, drilling and exploitation procedure will be initiated. Hydrocarbon reservoirs typically reach their production peak before the cost of extraction outweighed by the value it creates. This is known as Cessation of Production (CoP) date (Oil and Gas Authority, 2018). Once production ceases, the assets and installations must be disconnected from the reservoir and removed (Wilkinson et al., 2016). There are numerous offshore installations which are approaching obsolescence around the globe and would need to be decommissioned within the next few years (Fowler et al., 2014). Decommissioning of oil and gas installations may be include: leaving in place, complete or partial decommissioning, in-situ dumping/disposal at sea and or alternative reuse of the structure (Zawawi et al., 2012).

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While complete removal is based on the theory of "leaving the seabed as you found it" (Fowler et al., 2014), and can be assumed the most environmentally-sound decommissioning option which international regulations is favoured it, could be more complicated from the point of economic and technical feasibility and even can cause harm to marine environment (Bernstein, 2015). It is because oil and gas structures develop copious and diverse marine communities during the exploitation and production phase. Thus, complete removal of these assets may be adversely affected ecosystem and biological diversity and marine habitat. This has led to explore alternative decommissioning options such as using installations as artificial reefs (Sommer et al., 2019).

Artificial reefs are "submerged structures placed on the seabed deliberately, to mimic some characteristics of natural reefs" (Armono, 2004). Because of proven significant benefits of artificial reefs for fisheries, tourism, scientific purposes and etc., today, this method has been using broadly across the globe and although many international and national regulations have enacted its requirements, many nations still have blanket regulations towards artificial reefs (W. S. Alevizon, 1989).

Iran is one the biggest oil and gas producers in the world, however, there is no specific legislation related to decommissioning and its methods in national law. The topic of decommissioning of infrastructure or artificial reef placement in the Iran's national legislations has not been referred. Therefore, the aim of this study is to provide the ground for more researches and studies by discussing some important aspects of it.

This paper, first gives an explanation of artificial reefs concept, and the aims and effects of setting these structures up, and then will have a look at management, maintenance and monitoring of artificial reefs. Next, we will identify international and regional convention relevant to rigs to reef programmes in order to understand the position of international regulations for carrying out the operations. Subsequently, the existing Iran's regulation related to decommissioning and the possibility of using artificial reefs in the waters under Iran's sovereignty right will be evaluated to provide the basics for creating legal framework of artificial reefs.

2. An Introduction to Artificial Reefs

Artificial reefs are deployed for a variety of purposes, but the main aim is considered to enhance and rebuilt marine environment resources where the natural biota and habitat has been degraded. Converting oil and gas installations and structures to artificial reefs programme have been increased in recent years which makes it one of the most important alternative methods of decommissioning in many nations.

The following chapter provides a definition of artificial reefs as well as the main reason for artificial reefs deployment and the way of management and monitoring, and at the end of the section some significant case studies will be reviewed.

2.1. Backgrounds and Definition of Artificial Reefs

The first time an artificial reef was built for the purpose of ecology was in Japan during the 17th Century to grow kelp. The modern concept of artificial reefs however, was born in the 18th century in this country and carried over into United States in the beginning of the 19th century and, then Europe, in the mid-19th century started to use it (Mckinney, 2013).

There are different national and international regulations enacted artificial reefs' definition, however, one the most comprehensive delineation belongs to the definition of London Convention and Protocol Guidelines for the Placement of Artificial Reefs; Article 1,3 of the Guidelines which also embraces the purposes of these structure placement states that: " An artificial reef is a submerged structure deliberately constructed or placed on the seabed to emulate some functions of natural reef such as protecting, regenerating concentrating, and/or enhancing populations of living marine resources.

Objectives of an artificial reef may also include the protection, restoration and regeneration of aquatic habitats, and the promotion of research, recreational opportunities, and educational use of the area.

The term does not include submerged structures deliberately placed to perform functions not related to those of natural reef - such as breakwaters, mooring cables, pipelines, marine research devices or platforms – even if they incidentally imitate some functions of a natural reef."

As a result, structures considered to be artificial reefs that are exclusively placed to perform natural reefs' functions and this will exclude artificial islands, or structures such as breakwaters, established for coastal defence purposes (Burt et al., 2009).

2.2. Overview of the Objectives of Artificial Reefs

Artificial reefs can be placed in waters for a wide variety of purposes from research purposes to recreational and marine preservation. Therefore, they may be designed differently in order to perform distinctive intended functions. As it was aforementioned, artificial reefs constructed to play natural reefs' roles in the marine area. Oil and gas unused assets may be converted to artificial reefs in place or transport to a new area. In some situations, installations may begin to carry out the features of artificial reefs during their active operations.

- Although the purposes of artificial reefs placement cannot be excluded, the following objectives are believed to be the most common functions:
- Attraction, enhancement, production and protection of aquatic resources;
- Protecting sensitive habitats from fishing activities;
- Mitigating habitat loss;
- Enhancing biodiversity;

Creating potential networks of marine protected areas (MPAs) to manage the life cycles of fish and connectivity;

- Promotion of tourism and leisure activities;
- Scientific research and education (Fabi et al., 2015);

The objectives of artificial reefs are not excluded to these items, but they are typically designed to be multi-purpose in order to maximise the advantages of these structures (Handley, 2013).

Artificial reefs definitely have environmental and socio-economic benefits, however, there are some debates about the effectiveness of these structure to enhance marine biota, for instance it is claimed that artificial reefs simply attract sea creatures from surrounding areas and result in concentration in the area rather than truly enrich marine life (Techera & Chandler, 2015).

Artificial reef deployment can be a source to cause negative impacts during construction phase, transportation to the site, placement, and also once the reef has been stablished. During the construction and reef installation progress, there is a risk of releasing pollutants into the environment which might accumulate in the sediments. After the reef has been placed, there may be some long-term environmental changes (Bull & Love, 2019). The most expected change is considered to be sediment movements which typically occurs as a result of changes in wave action; artificial reefs may also have adverse impact on the aquatic and fish resources which may derived from ghost fishing, or increasing the potential fishing effort because of greater attainability (Fabi et al., 2015). For preventing these negative effects from happening, all the potential risks should be analysed and considered in reef plan (Polovina & Sakai, 1989).

Form a socio-economic aspect, in the absence of an appropriate management plan, the deployment of artificial reef can increase conflicts between the users of the reef and overexploitation of the reef resources. It is the reason of necessity of a comprehensive management plan in order to mitigate and eliminate the potential negative impact (Ramos, 2014). Although the socio-economic effects arising from artificial reef have been evaluated since the beginning installation deployed, there is still huge gap to dealing with the issue. The importance of collecting data associated with the socio-economic impact us to help justify construction and maintenance costs, provide useful information for successful management, and quantify the benefits of artificial reefs for public (Monteiro Cunningham & De Carvalho Saul, 2004).

Having said that, the negative impacts of employment of artificial reefs can be reduced through development of an adequate plan to regulate access and exploitation of the reef resources and any other potential environmental damages that might occurred. Moreover, the fact that artificial reefs will be placed in the marine area for decades, and the requirements of sustainable development, as well as the intergenerational distribution of natural resources, reinforce the need for a long-term monitoring and management plan.

2.3. Management, Maintenance and Monitoring Strategy of Artificial Reefs

Artificial reefs are believed to be an effective method to restore marine resources, fishery, and other functions which were mentioned. In order to artificial reefs operate and maximize their specified functions accurately, there is a need of an adequate regime for management and monitoring during pre-construction, construction and after placement of these assets in the seabed. Clarifying the aims and objectives for rigs to reef programmes will help to elucidate the requirements, and subsequently define the monitoring plan characteristics. Monitoring programmes are, typically, part of management plans which designed to ensure that the assets are sustainably managed and impose no negative impacts on marine biota and fish surrounding communities.

Monitoring plan covers physical, biological and socio-economic aspects of the project which will be administered through environmental and technical reports that contractor's hand over within regular time periods. The reports should be in accordance with regulatory and contractual requirements and are represented to competent bodies for ratification.

An appropriate management framework is a key feature to evaluate and enhance the performance of artificial reefs. Effectual management plan will mitigate potential risks to marine environment and any other hazards. The plan should be complied prior to the placement process. The aim of an adequate management plan is to ensure that the assets are sustainably managed and does not cause any negative environmental impact. The plan covers sub-management plans, monitoring programmes and any identified potential risks to marine biota (Bortone & Kimmel, 2013).

Monitoring programmes which are consist of physical, biological and socio-economic monitoring, are considered to be the key features of management plan. These would assess the long-term structural performance of the artificial reefs and help to ensure that the assets are providing the defined functions and ecological, environmental benefits. Placement of artificial reefs can alter physical and biological features of the area, it can modify flow velocity and create turbulent intensity in, and around the vicinity of the structures, which would cause changes in sediment accumulation in the area. All of the environmental changes in the seabed, in turn, can bring about the artificial structures to physically be affected. Hence, long-term monitoring of the assets are required to ensure flawless performance of artificial reefs and the sedimentary and oceanographic conditions (The Joint Artificial Reef Technical Committee of the Atlantic and Gulf States Marine Fisheries Commissions, 1998).

Monitoring programmes are designed to confirm the following factors:

- Water quality is maintained;
- The structural integrity and stability of the reef infrastructure is maintained over time;
- There is no increase of contaminants in the environment (water and sediments);
- The occurrence of pets and/or other invasive species is minimized and, if these events do occur, prompt reporting, management and/or remedial action will be implemented;
- The ecological, social and economic goals of the reef are achieved;
- Navigational safety is maintained (Fabi et al., 2015).

The competent body for issuing a licence and subsequent monitoring is different in various legal systems. As an example, the authorised organization in the United Kingdom is Marine and Fisheries Agency, in the USA is carried on commonly by Office of Marine Conservation along with, United States Army Corps of Engineers and, National Oceanic and Atmospheric Administration; whereas, the duty is performed by Department of the Environment and Heritage in Australia and Department of the Environment in Canada. On the other hand, there is no such an organization under Iran's regulation. However, the duty can be discharged through a committee composed of National Oil Company, Department of Environment, Iran Fisheries Organization, and The Ports and Maritime Organization.

3. Case Study

There are a various number of successful rigs to reef programmes all around the world from the Gulf of Mexico to North Sea in Europe. Here we are just mention three successful reefs to evaluate the impacts of artificial reef deployment on the marine environment.

3.1. Hammerfest Reefs

One of the most successful case studies of artificial reef is Hammerfest Reefs which is located in the very north of Norway, at the islands Seiland and Soroya, in a depth of 10-20 metres. Theses artificial reefs were constructed in 2006 for the purposes of enhancement and re-establishment of Kelp and other seaweeds and marine animals, as well as scientific researches. Hammerfest reefs that currently are covered by various types of marine plants, providing suitable shelter to replace the disappearance of the Kelp forests. No environmental impacts have been reported about the reefs so far (Jackson, 2009).

3.2. Gothenburg Reefs

Another successful case study of artificial reefs is Gothenburg Reefs which is located within two protected areas (Tanneskar and Buskar) outside of Gothenburg Harbour, Sweden in depths between 20 and 37 metres. The reefs were created in 2003 in order to compensate for the loss of habitat caused by the deepening of the shipping channel into Gothenburg Harbour, in particular habitat utilised by lobster. There has been a significant monitoring programme to track the growth of biological communities, which has showed that some aquatic animals such as lobster and commercial fish species, have been attracting to the reefs. However, some negative impacts by heavy sedimentation at some part of

the reef has been reported which caused a lack of oxygen in the area.

3.3. Loch Linnhe Reefs

Loch Linnhe artificial reefs are also considered as a successful programme. These reefs are located in West coast of Scotland off the island of Lismore in a depth 12-30 metres and were constructed in 2001-2006. The initial purposes of deployment of Loch Linnhe were facilitating research between artificial reefs and the environment, as well as beneficial effects on fisheries and local biodiversity. The long-term purpose is regarded to be boosting fish stock. There is ongoing monitoring to observe the function of the artificial reefs which can be successful so far. Nevertheless, some negative impacts such as reduction in the oxygen level which subsequently has led to decrease in species sensitive to low oxygen (Jackson, 2009).

4. International Regulations

The growing number of installations converted to artificial reefs, along with the potential negative impacts to marine environment require a comprehensive legal framework to control and regulate such developments. While some countries have regulation in this regard, the majority of states have blanket regulatory framework covering artificial reefs in place (Aabel, J.P., Cripps, S.J., Jensen, A.C., Picken, 1997). However, artificial reef deployment is covered by several international regulations. The most critical issue in international regulations is protection of the sea against pollution due to the dumping of hazard materials.

A list of the most important international and regional legislations is provided below to have better understanding of the requirements.

4.1. International Conventions

International conventions play undeniable role to frame legal regime of artificial reefs. The issue has received attention through the conventions which concentrate on marine environment preservation. Among all important international treaties, London Convention 1972, UNCLOS 1982 and Basel Convention are the most effective instruments in the world of artificial reefs programme.

a. London convention 1972

The 1972 Convention on the prevention of Marine Pollution by Dumping of Wastes and Other Matter (Known as the "London Convention"), which entered into force in 1972, is one of the first and important international conventions with the aim to protect the marine environment from all sources of pollution. In 1996, the London Convention Protocol was adopted to update the Convention and entered into force in 2006.

The initial purpose of the Convention was to prevent pollution by means of dumping wastes and other materials. Under the regulations all dumping is prohibited unless in certain circumstances; article III (1)(b)(ii), which similar provision can be found at Article 1 (4)(2)(3) of the Protocol, explicitly states that: "placement of matter for a purpose other than the mere disposal" is not included within the definition of "dumping". However, the article binds the placement to be "not contrary to the aims of this Convention". Despite the provided qualifications, the members were still concerned that placement or construction of artificial reefs circumvent the provisions of the Convention and lead to marine pollution.

In 2008, "the Guidelines for the Placement of Artificial Reefs (London Convention and Protocol/UNEP 2009) were developed to help coastal states in evaluating proposals for the placement of artificial reefs based on the Scientifics criteria. Although the Guidelines are not legally binding, can play a significant role for the states to enter the provisions in their national regulations in order to provide information of different purposes and types of artificial reefs and their potential impact, and prevent pollution as well as promote an approach to rigs to reef development.

The London Convention currently has 85 parties and Iran also ratified it in 1996 which makes implementation of the regulations obligatory for the country[1].

b. Unclos convention 1982

The 1982 United Nations Convention on the Law of the Sea (known as the "UNCLOS") was created to recognize the sovereign right of coastal states to explore and exploit resources in exclusive economic zone (EEZ) and continental shelf. This right, however, are restricted with the obligation to preserve and protect the marine environment (Martin, 2003). Article 60 provides that:

[1] For more information: https://www.imo.org/en/OurWork/Environment/Pages/London-Convention-Protocol.aspx (last accessed: 25/10/20)

"any 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".

UNCLOS has no specific regulation on artificial reefs. Nonetheless, there are some provisions regards to dumping; the Convention defines 'marine dumping' as the 'disposal of wastes and other matter… at sea' and in the regulation similar to the London Convention exclude the placement of installations in maritime area for purposes other than mere disposal. Article 60 also has regulation about artificial islands, installations and structures which can utilize the provision to have understanding of UNCLOS approach towards the matter of artificial reef which the same provision is provided in Article 80 about continental shelf.

Apart from the aforementioned articles, there are a few specific regulations in UNCLOS associated with the matter of disposal at sea and broadly the Convention left the details to states to develop their national legislations. Having said that, it can be implied from these rules that UNCLOS has acknowledged partial removal as well as the possibility of deployment of artificial reefs in both EEZ and continental shelf. However, the Convention is silent about the international waters.

Currently, 167 States have become a party to UNCLOS, however, 14 countries including Iran, Venezuela and Unites States has signed but not ratified it[1].

c. Basel convention

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal was adopted in 1989, and came into force in 1992. There are currently 188 parties [2] to the Convention that Iran also became a member of it in 1992. The Basel Convention has been created to prohibit pollution, disposal of hazardous and other wastes into environment and also manage transboundary movement. Article 4 outlines general obligation of the Parties and requires them to ensure 'the availability of adequate disposal facilities, for the environmentally sound management of hazardous wastes and other wastes[3].'

In 2002, the Parties adopted the "Technical guidelines for the environmentally sound management of the full and partial dismantling of ships" in order to provide strategies and recommendations to dismantle ship facilities in an environmentally sound manner as well as, monitoring and verification on environmental performance. The Guidelines also encompass vessels requiring partial dismantling, for instance, vessels requiring decontamination with a view to use as an artificial reef.

4.2. Regional Conventions

Along with the international treaties, many regional conventions also bring artificial reefs into focus around the globe. The importance of regional legislations is that they have been drafted for specific regions with consideration of special features of that area. In this chapter, the most important regional conventions from the distinctive regions are revised to have better understanding of artificial reefs' requirements.

a. The bucharest convention

The 1992 Convention on the Protection of the Black Sea against Pollution (known as the "Bucharest Convention") was ratified by six Black Sea coastal states and entered into force in 1994. The Convention which was created to preserve the environment and living resources of Black Sea[4], has four Protocols:

- The protocol on the Protection of the Marine Black Sea Environment against Pollution from Lad Based Sources (also known as the "LBS Protocol") adopted in 1992 and in force since 1994[5];
- The Protocol on Cooperation in Combating Pollution of the Black Sea Marine Environment by Oil and other Harmful Substances in Emergency Situations

[1] For more information: https://www.imo.org/en/OurWork/Legal/Pages/UnitedNationsConventionOnTheLawOfTheSea.aspx (last accessed: 25/10/20)
[2] For more information: http://www.basel.int/?tabid=4499 (last accessed: 21/10/20)
[3] Art 4.2
[4] For more information: https://ec.europa.eu/environment/marine/international-cooperation/regional-sea-conventions/bucharest/index_en.htm (last accessed: 25/10/20)
[5] The revised Protocol on Protection of the Black Sea Marine Environment against Pollution from Land Based Sources and Activities was adopted in 2009 and has not yet entered into force.

(also known as the "Emergency Response Protocol"), adopted in 1992 and in force since 1994;

- The Protocol on the Protection of the Black Sea Marine Environment Against Pollution by Dumping (also known as the "Dumping Protocol"), adopted in 1992 and in force since 1994;
- The Black Sea Biodiversity and Landscape Conservation Protocol to the Convention on the Protection of the Black Sea Against Pollution 9also known as the "CBD Protocol"), adopted in 2002 and not yet entered into force.

Article 8 of Dumping Protocol applies to artificial reefs as well, the Article states that:

"1. Each Contracting Party shall take the measures required to implement this Protocol in respect of:

a) Vessels flying its flag or aircraft registered in its territory;

b) Vessels and aircraft loading in its territory wastes or other matter which are to be dumped;

c) Platforms and other man-made structures at sea situated within its territorial sea and exclusive economic zone;

d) Dumping within its territorial sea and exclusive economic zone.

Moreover, The General Fisheries Commission for the Mediterranean (GFCM) of the Food and Agriculture Organization of the United Nations (FAO) has arranged a series of meetings to discuss about the placement of artificial reefs in Black Sea and Mediterranean Sea. As a result of the discussions, the Committee generated guidelines for deployment, maintenance and monitoring of artificial reefs for the States. The Guidelines was created with the aim of regulating programming, deployment, construction and monitoring management of artificial reefs (Fabi et al., 2015).

b. Ospar convention

The Convention of the Protection of the Marine Environment of the North-East Atlantic was open for signature at the Ministerial Meeting of the Oslo and Paris Commissions in Paris on 1992 and entered into force on 1998[1]. The Convention has been signed and ratified by all of the Contracting Parties to the original Oslo and Paris Conventions[2] and currently is considered to be one of the most important regional conventions along with the 98/3 decision not only in Europe but also globally.

Under OSPAR regulations, Contracting Parties shall take all possible steps to prevent and eliminate pollution, and all essential measures to protect marine environment against any pollution and human harmful activities (LiNSI, 2015). OSPAR accepted the approach in which requires the Parties to entirely remove installation from the seabed (O'Sullivan, 2018). However, Article 5 of Annex 2 implicitly adopts the placement of artificial reefs, the Article states that: "No placement of matter in the maritime area for a purpose other than that for which it was originally designed or constructed shall take place without authorisation or regulation by the competent authority of the relevant Contracting Party. Such authorisation or regulation shall be in accordance with the relevant applicable criteria, guidelines and procedures adopted by the Commission in accordance with Article 6 of this Annex. This provision shall not be taken to permit the dumping of wastes or other matter otherwise prohibited under this Annex."

With growing number of installations has been used as artificial reefs, the Contracting Parties proceeded to draft a guideline to specify artificial reefs' requirement. Nonetheless, the proposal of creating artificial reef guidelines, revealed Parties dissent on the matter. The objectors have believed that existence of such a deed would lead to circumventing the Convention provisions against dumping and pollution (Techera & Chandler, 2015). However, "OSPAR Guidelines on Artificial Reefs in relation to Living Marine resources" approved and ratified by all members in 1999. The aim of the Guidelines was defined to assist the Parties to evaluate the potential consequences of artificial reefs on the marine environment.

OSPAR Commission also issued another important document in 2009 to provide preliminary assessment of artificial reefs in the OSPAR Maritime Area, their effects on ecosystems and biological diversity, and the effectiveness of the current regulatory framework. The document, "Assessment of Construction or Placement of Artificial reefs" tries to give some insight into differences between the OSPAR regions.

[1] For more information: https://www.ospar.org/about (last accessed: 20/10/20)

[2] Belgium, Denmark, the European Union, Finland, France, Germany, Iceland, Ireland, the Netherlands, Norway, Portugal, Spain, Sweden and the United Kingdom of Great Britain and Northern Ireland) along with Luxembourg and Switzerland.

c. Barcelona convention 1995

The 1995 Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean was signed in 1976 and amended in 1995. The Convention currently has 22 Parties including European Union, and encompasses 7 Protocols and two Guidelines[1].

In 2005, the Contracting Parties drew up guidelines for the purpose of the placement of matter. "Guidelines for the Placement at Sea of Matter for Purpose Other than the Mere Disposal Thereof" was created to assist Contracting Parties to consider the consequences of placement of artificial reefs on the seabed and fulfil their obligation. Although the Guidelines are not legally binding, can be used by Contracting Parties as the basis to create and develop their own national regulations.

d. Kuwait convention 1979

The regional Kuwait Convention entered into force in 1979 and was adopted by Iran in 2014. The Convention was created to prevent, abate, and combat pollution of the marine environment from various sources of pollution from ships, pollution caused by dumping from ships and aircrafts, pollution from land-based sources and other human activities[2]. In this regard, the Parties has to ensure that the process of industrial development does not cause any damage to the marine environment of the Region and they are required to develop an integrated management approach to the use of the marine environment.

- Protocol concerning Regional Cooperation in Combating Pollution by Oil and Other Harmful Substances in Cases of Emergency (1978);
- Protocol for the Protection of the Marine Environment against Pollution from Land-Based Sources (1990);
- Protocol on the Control of Marine Transboundary Movements and Disposal of Hazardous Wastes and Other Wastes (1998); and
- Protocol Concerning the Conservation of Biological Diversity and the Establishment of Protected Areas.

The Convention which covers the area of Persian Gulf and Oman Sea provides in Article V that: "The Contracting States shall take all appropriate measures to prevent, abate and combat pollution in the Sea Area caused by dumping of wastes and other matter from ships and aircraft, and shall ensure effective compliance in the Sea Area with applicable international rules relating to the control of this type of pollution as provided for in relevant international convention".

5. Artificial Reefs Deployment under Iran's Regulations

Iran has unique position in terms of hydrocarbon reserves which most of them are currently operating. However, it is expected that a significant number of installations become obsolescence in coming years, and decline of the reservoirs' pressure leads production to a non-economic point. Considering the fact that Iran's oil and gas resources can be largely attributed to their rapidly maturing production level, it is vital to take all necessary steps to manage and remove the obsolete installation from the seabed.

The key legislation governing oil and gas exploration and exploitation is mainly governed by "Duties and Powers of the Ministry of Oil" 2012 and "Petroleum Law Reform Act" 2011, nevertheless, none of these regulations nor any other legislation refer to the issue of decommissioning and its alternative methods including artificial reefs. This is while, many countries ratified laws and regulations on deployment of artificial reefs.

As a result, it is inevitable to fill the gaps with the current national and international regulation. The international and regional provisions have been mentioned, so, the focus in this section will be on existing legislations.

The only regulation which can be interpreted that is noted decommissioning, is "Construction and Deployment of Installations in Iran's continental Shelf and Exclusive-Economic Zone in Persian Gulf and Oman Sea Guidelines" 1996.

Article 13 states that: "for the purpose of safety in shipping routes and marine environment, owners of assets and installations are obliged to transfer all the unused or obsolescent assets from the specified marine zones. The intention must be notified to Ministry of Road

[1] For more information: https://ec.europa.eu/environment/marine/international-cooperation/regional-sea-conventions/barcelona-convention/index_en.htm (last accessed: 21/10/20)

[2] For more information: https://www.informea.org/en/treaties/kuwait-regional-convention (last accessed: 18/1020)

and Transportation[1] (Prots and Maritime Organization) in order to declare to International Maritime Organization". The phrase "transfer" in the Article which means decommissioning along with the obligation is imposed to "all unused or obsolescent assets" would bear in mind that the Guidelines take the complete decommissioning approach (Shiravi and Falahati, 2019). However, Article 2 of the Guidelines, acknowledges the sovereign right of the State to utilize installations and marine facilities for scientific and environmental purposes. This article can be interpreted as the State admits the possibility of placement of platforms and installations as artificial reefs.

"Islamic Republic of Iran's Marine Zones in Persian Gulf and Oman Sea Act" 1993 enumerates the State's right in the EEZ. Article 14 (b) allows construction and deployment of artificial islands, and other installations, assets and lay on pipelines and any other submarine cable, as well as scientific researches and preservation of marine ecosystem. Although, the article expresses nothing about artificial reefs, it can be inferred that the government has the right to place artificial reefs for the article's defined purposes. This right is also admitted in continental shelf by Article 15.

Waste Management Act 2004, defines waste to: "any solid, liquid, or gas (non-sewage) which directly or indirectly arising out of human activities and is considered to be unused by the producer". The Act also classified wastes into 5 categorises of 'regular wastes', 'medical wastes (hospital)', 'special wastes', 'agricultural wastes', and industrial wastes' embodies petrochemical wastes. Waste Management Guidelines of National Iranian Oil Company accepts the definition in Article 4 of the Guidelines and obliges all oil companies as well as producers of hazardous wastes to dispose and eliminate all the waste according to the Guidelines.

With reviewing all wastes numerated in the Guidelines and any other regulation can conclude that parts of platforms and installations which are not included in the definition of special or hazardous wastes, are allowed to remain in place for the aim of artificial reefs programme. All the assets converted to artificial reefs can be used for scientific researches, tourism attraction, fishing and other advantages of Iran's Waters.

For the purpose of artificial reefs in Iran's marine area, it can be pointed out to Behregansar Platform in Persian Gulf which has been speaking about converting it to museum and sea hotel, in recent years. Behregansar Platform is the oldest oil platform of Iran which was created in 1961, and considered to be the main oil platforms. However, after the War and with the platform depreciation, it becomes obsolescence. As the first offshore platform in Persian Gulf, Behregansar is historically valuable for the industry and the country. It needs, however, a restoration and strengthening to use as an artificial reef and this would require an adequate programme[2].

With growing number of assets and platforms become obsolescence in Iran's marine area, there is an extreme need of laws and regulations in this area.

6. Conclusion and Remarks

Iran's national regulation is silent about decommissioning and its different methods and there is currently no clear policy guidance on whether in situ decommissioning would be accepted and in what circumstances. As a State with enormous oil and gas resources, there is a potential capacity for the industry to play a significant role in the decommissioning industry. Nonetheless, the requirements have not been specified in IPC, Petroleum Act nor any other regulation related to environmental activities.

While Iran has ratified a lot of international and Regional conventions like UNCLOS, London Convention, it seems appropriate that NOC codifies regulations and guidelines with the specific requirements of its waters. Moreover, as deployment of artificial reefs has increasingly grown around the world, and with all the potential advantages for maritime area, it is perfectly appropriate to assess the capability of Iran's sea for placement of these assets and also provide regulatory and contractual frameworks. For this purpose, comparative study and analysis of mature countries in decommissioning sector like Norway, United Kingdom, United States and other coastal states would be helpful

[1] The Ministry of was created in 1353 and turn into Ministry of Roads & Urban Development Islamic Republic of Iran in 1390

[2] For more information: http://www.taadolnewspaper.ir/%D8%A8%D8%AE%D8%B4-%D8%AC%D8%A7%D9%85%D8%B9%D9%87-67/115301-%D8%A8%D9%87%D8%B1%DA%AF%D8%A7%D9%86%D8%B3%D8%B1-%D8%AF%D8%B1-%D8%A7%D9%86%D8%AA%D8%B8%D8%A7%D8%B1-%DA%AF%D8%B1%D8%AF%D8%B4%DA%AF%D8%B1%D8%A7%D9%86 (last accessed: 15/10/20)

to utilize the marine potential in accordance with environmental concerns.

Another important issue that should be considered is defining the competent authorization for issuing license to placement of artificial reefs and subsequently its maintenance and monitoring. The authors propose that a commission consist of National Oil Company, Department of Environment, Iran Fisheries Organization, and The Ports and Maritime Organization, take the responsibility of licensing and monitoring on the programmes.

In conclusion, by acceptance the fact that a huge number of assets and installations in Iran's seas are obsolescing and must be removed from the seabed, it is inevitable to predict the requirements. In considering future developments in Iran, it is valuable to explore other jurisdictions where laws and policies have addressed the issue of legal regulation pf partial and in situ decommissioning as well as artificial reefs as an alternative method of complete removal. Because of the complexity and high cost of removal and in the case of deployment the assets as artificial reefs which need continuing monitoring and they have long lasting environmental effect, the sooner the government regulate the requirements, the cost will be saved and the negative impacts will be decreased, since by passage of time and abandoning installations the cost and risks will increase.

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