

**International Legal Requirements and Solutions for
Countering the Adverse Environmental Impacts of the
Construction and Operation of Desalination Plants in
the Persian Gulf and the Sea of Oman
(Original Research)**

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Extended Abstract

The current needs of the international community require States to employ new technologies. Among these technologies, seawater desalination facilities are used to address the water shortage crisis faced by the arid States bordering the Persian Gulf and the Sea of Oman.

The aridity of the coastal areas of the Persian Gulf and easy access to seawater has led to the establishment of about 45% of the world's desalination plants in the Persian Gulf. Given that the number and capacity of desalination plants on the coasts of the Persian Gulf and the Sea of Oman are expected to increase, and on the other hand, noting the possible negative impacts of desalination plants built in the coastal states of the Persian Gulf and the Sea of Oman on the environment, the present study seeks to assess the international environmental legal requirements incumbent upon the States that establish and operate such facilities which are necessary to comply with.

Scientific predictions indicate that by 2030, the water resources of the coastal states of the Persian Gulf and the Sea of Oman will be reduced to more than half of their current capacity, and the region will experience water stress. Therefore, states in this area have established desalination plants to

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cope with water shortage and meet the increasing water demand. While it is expected that the provision of fresh water through desalination of water from the Persian Gulf and the Sea of Oman will reduce the likelihood of problems arising from water stress, concerns have been raised regarding the increased levels of environmental pollution resulting from the discharge of brine from the desalination process into marine areas, which may cause tension between states in the region in the future. Therefore, addressing the issue is vital.

The article's research method is descriptive-analytical, using library resources and analysis of existing legal documents. In order to achieve the research goal, this study is structured in three main sections. The first section discusses the history of seawater desalination projects in the Persian Gulf and the Sea of Oman and their impacts on the marine environment. The second section elaborates on the international legal obligations of coastal states in the Persian Gulf and the Sea of Oman in constructing and operating desalination facilities, and the final section examines and puts forward strategies for the sustainable operation of seawater desalination projects in the Persian Gulf and the Sea of Oman.

There are no specific provisions in public international law to prohibit, control, or reduce the discharge of brine resulting from the desalination process into the sea and to protect the marine environment against such facilities. However, given the definitions of the terms “pollution” and “land-based sources” provided in relevant general and regional treaties — including the United Nations Convention on the Law of the Sea (1982), the Kuwait Regional Convention for Co-operation on the Protection of the Marine Environment from Pollution (1978), and its related protocol, the Protocol for the Protection of the Marine Environment against Pollution from Land-based Sources (1990) — and considering that seawater desalination facilities, including those in the Persian Gulf and the Sea of Oman, are located on the coast and that the brine resulting from their activities is often discharged into the sea, the host and operator States of such facilities are required to take all necessary measures to ensure their sustainable operation in compliance with relevant international obligations, including protecting the marine environment, preventing pollution from these facilities from entering marine areas, and conserving marine biodiversity.

Given that the identified obligations are a type of obligation of conduct, the identification of the type and examples of measures necessary to fulfill them should be carried out by coastal States, taking into account the standard of care. Among the most important of these measures are the adoption of technical methods such as brine dilution, wastewater discharge in safe areas, desalination of groundwater as an environmentally friendly alternative, and the adoption of methods to reduce energy consumption and manage carbon emissions from these facilities.

furthermore, adopting a number of legal provisions by delving into the content and using the capacity of the Kuwait Regional Convention of 1978 and the Regional Organization for the Protection of the Marine Environment (RAPME), such as approving technical and quality standards for the use of desalination facilities, approving a new protocol under the Kuwait Convention governing the use of desalination plants, establishing a Compliance and Implementation Committee to monitor the level of compliance of coastal States with their obligation to protect the marine environment and, if necessary, providing them with technical and financial assistance.

Finally, implementing the Kuwait Convention's dispute resolution mechanism is one of the legal methods that can significantly reduce any environmental damages that could be caused by desalination plants on the coasts of the Persian Gulf and the Sea of Oman. Undoubtedly, the effectiveness of these methods will yield benefits when political, economic, and technical obstacles, such as political and developmental rivalries give way to international empathy and solidarity to preserve the region's environment as a valuable heritage for the present and future generations.

Keywords

Water Scarcity, Seawater Desalination, Persian Gulf, Sea of Oman, Kuwait Convention, Land-based Sources of Pollution, Marine Environment

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