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Review

# Management frameworks for coastal and marine pollution in the European and South East Asian regions

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ABSTRACT

The continuing threat of pollution on coastal and marine environment and resources has been addressed on regional scale over the past decades. This paper describes and compares the coastal and marine pollution management frameworks in the European and South East Asian regions. It highlights the differences and commonalities of the two regions in terms of the approach each has taken to address the transboundary pollution issues. It also focuses on the actions taken by France and the Philippines as parties to these regional management frameworks. A brief examination of the drivers and pressures on coastal and marine ecosystems as well as its current state showed that in both regions pollutants persist despite previous efforts to manage the release of pollutants from anthropogenic sources. The enactment of the Water Framework Directive and Marine Strategy Framework Directive is the most recent response of the European Union (EU) to deal with persistent pollution issues in European waters. In South East Asia, management frameworks have also been developed through regional projects and programs supported by various international (*e.g.*, UNEP) and regional institutions (*e.g.*, ASEAN, PEMSEA). In both regions, the management frameworks take a holistic and functional management approach, although the EU member states have taken the action a step further by forging legally binding regional policies. Adopting a common and legally binding policy in SEA has been very difficult due to the varying geographical, political, social as well as economic settings of countries in this region. EU Member States like France have undertaken activities and actions in accordance with the requirements of the WFD and MSFD. On the other hand, the Philippines had been an active participant to the various regional projects and programs in SEA, though its compliance to the tasks and obligations of the regional conventions on coastal and marine pollution management had been limited due to other more pressing problems domestically. We conclude that despite the challenges encountered by EU Member States in complying with the EU Directives, there is a need for SEA to also move towards adopting and implementing a similar region-wide and legal framework for effective management of coastal and marine pollution issues.



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## 1. Introduction

Coastal and marine ecosystems worldwide are continuously being threatened by pollution issues, such as eutrophication, toxic substances (pesticides, POPs), heavy metals, acidification and siltation resulting from human activities (Adams, 2005). Decline in ecosystem productivity, loss of biological diversity, alteration of habitats and contamination of aquatic biota are among the most important effects of these pollutants (Lepom *et al.*, 2009; Romero *et al.*, 2007). An estimated 80% of pollution load in coastal and marine environments originate from industrial, agricultural, urban/rural and other land-based activities (Hildering *et al.*, 2009). Aside from the persistence of some contaminants, there has been serious concern over the extent of contamination. Owing to the transboundary nature of the coastal and marine environment, some of these pollutants are transported and carried over long distances which results in adverse impacts beyond national scale. Hence, pollution has been treated as a regional issue in the past few decades and has become one of the main themes of various regional and/or international treaties and agreements (Hassan, 2003; Hildering *et al.*, 2009).

Global, regional and national frameworks are being taken to reduce the input of polluting substances into coastal and marine environment. The United Nations Convention on the Law of the Sea (UNCLOS) is a global treaty that includes some general principles for the prevention, reduction or control of pollution of the marine environment and calls upon States to harmonize their policies accordingly. The United Nations Environment Programme (UNEP) implements the Regional Seas Programme (RSP), which is aimed at protecting coastal and marine habitats through sustainable management and use of marine resources. This program covers the Arctic, Baltic Sea, Black Sea, Caspian Sea, Mediterranean, Northeast Atlantic, East Asian Seas, among others (Law *et al.*, 2010). Since its launch in 1974, the Regional Seas Programme has been at the forefront of engaging neighboring states to take comprehensive and specific actions to protect their shared waters. UNEP also facilitates the implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA), which was adopted in 1995 and called for new forms of collaboration between governments, organizations and institutions concerned with marine and coastal areas at all levels, *i.e.* national, regional and global. In addition, the International Maritime Organization (IMO) serves as the UN system's regulatory arm that promotes global and regional standards of maritime safety and security, efficiency of navigation and prevention and control of pollution from ships (www.imo.org).

In Europe, international agreements such as the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR), Baltic Marine Environment Protection Commission (HELCOM) and the Mediterranean Action Plan (MAP) provide some of the earlier legally binding frameworks for regional cooperation to manage pollution problems (UNEP, 2002). Moreover, EU member states already have commitments to protect their marine resources and habitats under European law (Rogers *et al.*, 2007). The levels of certain pollutants are declining in this region (UNEP, 2012), although certain persistent chemicals remain to be of particular concern including those contained in pharmaceuticals and personal care products (PPCPs) (Richardson *et al.*, 2005; Verlicchi *et al.*, 2010; Qingwei *et al.*, 2013). Also, it has been asserted that while regional conventions, such as HELCOM and OSPAR as well as other earlier directives enacted by EU have been helpful, the policy frameworks remain fragmented and stronger approaches are required to protect the European coastal and marine environment (Gammeltoft, 2006).

In the developing region of South East Asia, numerous international conventions pertaining to the protection of the seas from pollution have been signed by one or more (but never all) South East Asian nations. Regional level cooperation among the neighboring countries in confronting the immediate and long term threat posed by transboundary pollutants began in the 1970s under the banner of the Association of Southeast Asian Nations (ASEAN). Since then, there have been a number of multilateral initiatives, plans and programs that these countries have engaged in to deal with pollution issues (Chou, 1994; Elliott, 2012). Still, the coastal and marine ecosystems of Southeast Asia are among the most seriously degraded (Contreras, 2008) and pollution remains inadequately managed. In addition, as in Europe, new products designed by industries or human health are regularly and probably increasingly released into the environment.

Over the past decade, a variety of environmental management policies for marine and estuarine resources and water quality has been adopted and implemented both at the national level and across regions. These policies have evolved towards a relatively common framework that follows an integrated management approach. Legal frameworks increasingly address the ecosystems as a unit in dealing with coastal and marine pollution issues. The different regions of the world have variable progress and success in developing, adopting and implementing these environmental management frameworks due to geographical, cultural, socio-economic and political diversity.

South East Asia consists of countries in the mainland Asia (Cambodia, Lao People's Democratic R1epublic, Myanmar, Thailand and Viet Nam) and countries in the Malay Archipelago (Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore) (Pido *et al.*, 2011). The region borders the Gulf of Thailand, the Andaman Sea, the West Philippine Sea, and the Pacific Ocean (Todd *et al.*, 2010). The archipelagic countries of Indonesia and the Philippines alone comprise over 24,000 islands. Europe, on the other hand, has many seas surrounding the States. It may be argued that this physical and geographical difference between these two regions makes it impossible to compare the management approach taken to protect their respective coastal and marine environment. However, these two regions have common experiences in environmental governance which is greatly influenced by the political, economic and socio-cultural diversity among nations. Countries in these two regions have different forms or systems of governance in managing their resources, which together with differences in culture, traditions, development trajectories, and management systems, contribute to the difficulties of formulating regional policies (ADB, 2014). The competing spatial claims and conflicts between maritime economic activities and biodiversity was suggested to have resulted in fragmented suite of policies, regulations and initiatives at various levels in both regions (van Tatenhove, 2013). Thus, how each region has overcome and progressed in dealing with the region-wide deterioration of the coastal and marine environment makes for an interesting comparison.

This paper reviews and compares the most recent regional frameworks in Europe (*i.e.* Water Framework Directive and Marine Strategy Framework Directive) and South East Asia (*e.g.*, ASEAN Marine Water Quality Criteria, Sustainable Development Strategy) which provide regulations, guidelines and measures for coastal and marine pollution. A brief description of the drivers, pressures, current state and observed impacts of pollution on coastal systems in Europe and South East Asia is presented. The important features of the regional frameworks are discussed, focusing on some of the activities undertaken by France and the Philippines to comply with the requirements of these frameworks. The priority actions towards the formulation and adoption of a legally-binding regional framework combat marine pollution in SEA is discussed.