



# Whitaker Institute Policy Brief Series

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**Cluster:** Social Innovation, Participation and Processes (SIPPs)

**Theme:** Public-Sector Innovation and Reform

**Further Reading:**

Domegan, C., McHugh, P., Biroscak, B.J., Bryant, C., Calis, T. (2017). Nonlinear causal modelling in social marketing for wicked problems. *Journal of Social Marketing*, 7(3): 305–329.

<https://doi.org/10.1108/JSOCM-02-2017-0007>

McHugh, P., Domegan, C. and Santoro, F. (2016). Sea Change Co-Creation Participation Protocol for Work Package 5–Governance. *EU Sea Change Project*. Whitaker Institute, NUI Galway, Ireland.

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**Read More About:** [SIPPs](#) research cluster within the Whitaker Institute for Innovation and Societal Change

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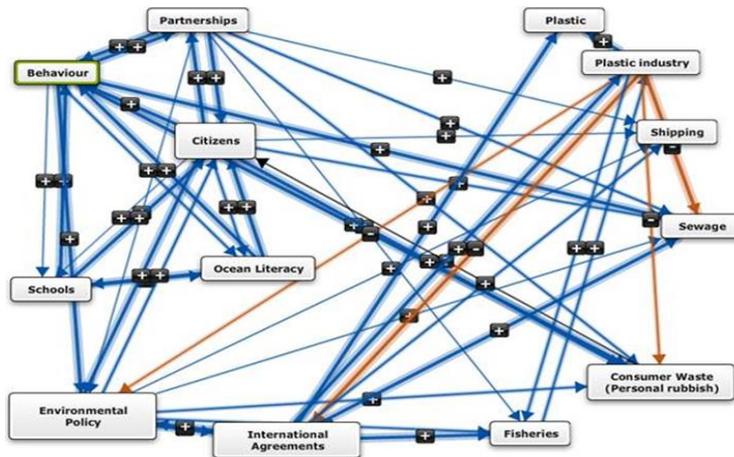
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## Mapping Policy Interfaces for Marine Litter

At the 2015 G-7 Leaders’ Declaration Summit, G-7 leaders acknowledged that ‘marine litter, in particular plastic litter, poses a global challenge, directly affecting marine and coastal life and ecosystems and potentially also human health’. With this in mind, research from Sea Change—a Horizon 2020 project—engaged in European dialogue with marine governance actors. A modelling approach called Fuzzy Cognitive Mapping examined the forces at work for marine litter. Fuzzy Cognitive Mapping (FCM) seeks to understand marine systems *with* individuals and priority groups, rather than *on* their behalf, to improve decision making and subsequent policy development.

### Research Findings

Direct outputs of the dialogue process with marine governance stakeholders are maps of the perceived sociocultural, institutional, structural, and behavioural forces that influence marine litter. These system maps, like the one illustrated below, highlight the underlying patterns, their complexity, and reciprocal relations.



In this map, 13 forces underpin marine litter in a specific country context. Blue arrows represent positive relationships, while red arrows depict negative relationships or influences. For example, citizens influence sewage; more citizens mean increased sewage in the marine environment. This represents a direct relationship, much like that of sewage and international agreements. In the map, there is no direct relationship between citizens and international agreements; however, these forces indirectly influence on one another through their direct causal relationships with sewage. These interacting and dynamic relationships are critical to a more strategic understanding of complex marine environmental problems.

### Policy Implications

Marine litter poses a global challenge. The first target of the Sustainable Development Goal (SDG) 14, focusing on marine pollution, is to ‘prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution’ by 2025 (SDGs, 2016). To achieve this goal, it is vital for policy makers to understand the interacting forces of complex environmental problems. This study recommends the use of multi-causal mapping tools and methods, such as FCM, to inform policy-interfaces and the governance of the ocean.