Tackling the Challenge of Marine Debris with Participatory Transdisciplinary Case Studies

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Preventing and mitigating marine debris poses a wicked problem to society. Beside the need to inform those who are engaged in tackling different facets of this problem with comprehensive observations of the marine debris that enters the ocean from different sources and what is in the ocean, there is a need to bring a wide range of stakeholders from all societal sectors together in transdisciplinary efforts. The "Plastics in the Ocean" initiative of IEEE/OES utilizes participatory modeling and transdisciplinary case studies to identify the societal information needs and to develop interventions for prevention and mitigation.

At two workshops organized in November 2018 and December 2019 in Brest, France, a participatory approach was utilized to develop a road map for a transdiscplinary approach to the wicked problem of mitigating the threat marine debris poses to the marine biosphere (Plag, 2020a).

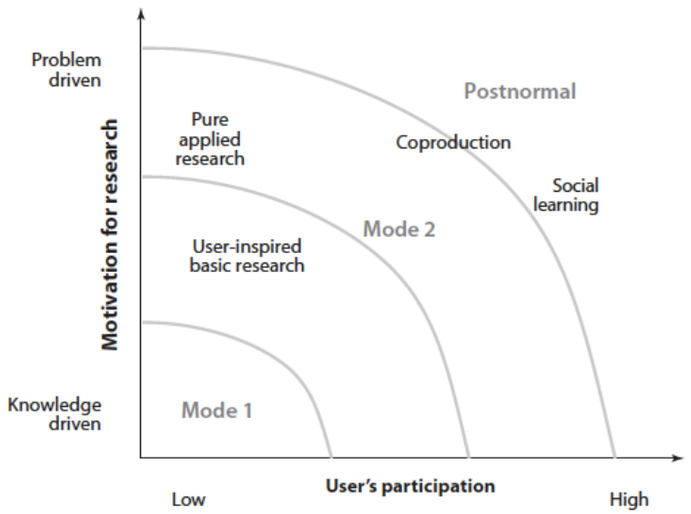

Fig. 1:Evolution in the complexity of knowledge production and user participation. From Kirchhoff et al. (2013).

The participatory modeling at the workshop engaged in knowledge creation that was fully problem driven and aimed at high user participation (Fig. 1). Followed a template for case studies of wicked problems (Fig. 2), the workshop participants first create a joint understanding of the problem and visualized a desirable future. A next step focused on a better understanding of the decision space through a mapping of stakeholders. These steps established a basis for the conceptual modeling of the system that represents plastic flow from production and use to the handling of waste and the leaking into the environment.

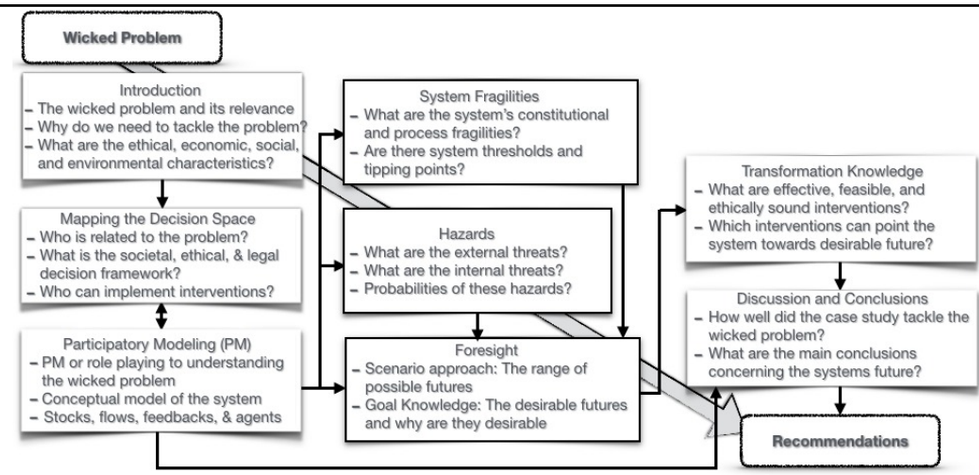

Figure 2: The MARI Case Study Template for tackling wicked problems with a transdisciplinary approach. From Plag (2021).

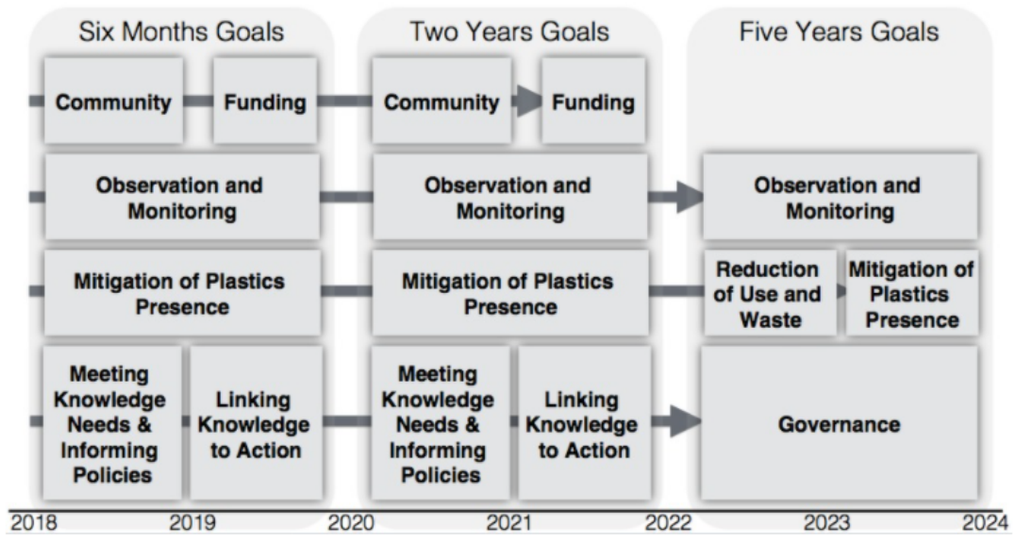

Figure 3: The structure of the goals and activities that were identified for the road map during the 2018 Workshop. From Plag (2020b).

The road map aims to organize the work of the Initiative towards the overarching goal of supporting society in efforts to tackle the challenge of ocean plastics through evidence and knowledge-based decision and policy making. The road map lays out goals that need to be reached in order to make progress towards a vision of an ocean with significantly reduced plastics and, more generally marine debris.

The road map includes six months, two years, and five years goals. These goals can be grouped under four main themes (Fig. 3):
1) linking data and knowledge to actions and informing governance;
2) mitigation of plastics and reducing its presence;
3) observation and monitoring;
4) community building.

References
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