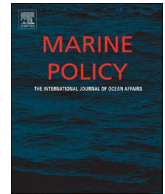




Contents lists available at ScienceDirect

## Marine Policy

journal homepage: [www.elsevier.com/locate/marpol](http://www.elsevier.com/locate/marpol)

## A rapid assessment of co-benefits and trade-offs among Sustainable Development Goals

Gerald G. Singh<sup>a,\*</sup>, Andrés M. Cisneros-Montemayor<sup>a</sup>, Wilf Swartz<sup>b</sup>, William Cheung<sup>a</sup>, J. Adam Guy<sup>c</sup>, Tiff-Annie Kenny<sup>d</sup>, Chris J. McOwen<sup>e</sup>, Rebecca Asch<sup>f</sup>, Jan Laurens Geffert<sup>e,g</sup>, Colette C.C. Wabnitz<sup>a,h</sup>, Rashid Sumaila<sup>i</sup>, Quentin Hanich<sup>j</sup>, Yoshitaka Ota<sup>k</sup>

<sup>a</sup> Nippon Foundation NEREUS Program, Institute for the Oceans and Fisheries, The University of British Columbia, 2202 Main Mall, Vancouver, BC, Canada V6T1Z4

<sup>b</sup> Ocean Policy Research Institute, Sasakawa Peace Foundation, 1-15-16 Toranomon, Minato-Ku, Tokyo, Japan

<sup>c</sup> Department of Architecture, Plymouth University, Plymouth, Devon PL4 8AA, UK

<sup>d</sup> Department of Biology, University of Ottawa, 30 Marie Curie, Ottawa, Canada

<sup>e</sup> UN Environment World Conservation Monitoring Centre, 219 Huntingdon Rd, Cambridge CB3 0DL, UK

<sup>f</sup> Department of Biology, East Carolina University, Greenville, NC 27858, USA

<sup>g</sup> Department of Geography, University of Cambridge, CB2 3EN Cambridge, UK

<sup>h</sup> Changing Ocean Research Unit, Institute for the Oceans and Fisheries, The University of British Columbia, 2202 Main Mall, Vancouver, BC, Canada V6T1Z4

<sup>i</sup> Fisheries Economics Research Unit, The University of British Columbia, 2202 Main Mall, Vancouver, BC, Canada V6T1Z4

<sup>j</sup> Nippon Foundation NEREUS Program, Australian National Centre for Ocean Resources and Security (ANCORS), University of Wollongong, Northfields Ave Wollongong NSW 2522, Wollongong, Australia

<sup>k</sup> Nippon Foundation Nereus Program, School of Marine and Environmental Affairs, The University of Washington, 3707 Brooklyn Ave NE, Seattle, WA 98105, USA

## ARTICLE INFO

## Keywords:

Sustainable Development Goals  
Ocean sustainability  
Policy prioritization  
Sustainability framework  
Sustainability relationships

## ABSTRACT

Achieving the United Nations' 17 Sustainable Development Goals (SDGs) results in many ecological, social, and economic consequences that are inter-related. Understanding relationships between sustainability goals and determining their interactions can help prioritize effective and efficient policy options. This paper presents a framework that integrates existing knowledge from literature and expert opinions to rapidly assess the relationships between one SDG goal and another. Specifically, given the important role of the oceans in the world's social-ecological systems, this study focuses on how SDG 14 (Life Below Water), and the targets within that goal, contributes to other SDG goals. This framework differentiates relationships based on compatibility (co-benefit, trade-off, neutral), the optional nature of achieving one goal in attaining another, and whether these relationships are context dependent. The results from applying this framework indicate that oceans SDG targets are related to all other SDG goals, with two ocean targets (of seven in total) most related across all other SDG goals. Firstly, the ocean SDG target to increase economic benefits to Small Island Developing States (SIDS) and least developed countries for sustainable marine uses has positive relationships across all SDGs. Secondly, the ocean SDG target to eliminate overfishing, illegal and destructive fishing practices is a necessary pre-condition for achieving the largest number of other SDG targets. This study highlights the importance of the oceans in achieving sustainable development. The rapid assessment framework can be applied to other SDGs to comprehensively map out the subset of targets that are also pivotal in achieving sustainable development.

### 1. Introduction

Achieving sustainable development faces many ecological and social challenges, such as single sector resource management, resource scarcity, environmental contamination, and the persistence of forced

labour [1,2]. These challenges are interlinked and to address them will require a concerted international effort beyond independent or specialized programs [2]. In 2015, The United Nations formalized 169 targets to gauge progress towards sustainability under 17 Sustainable Development Goals (SDGs), including for example eradicating poverty

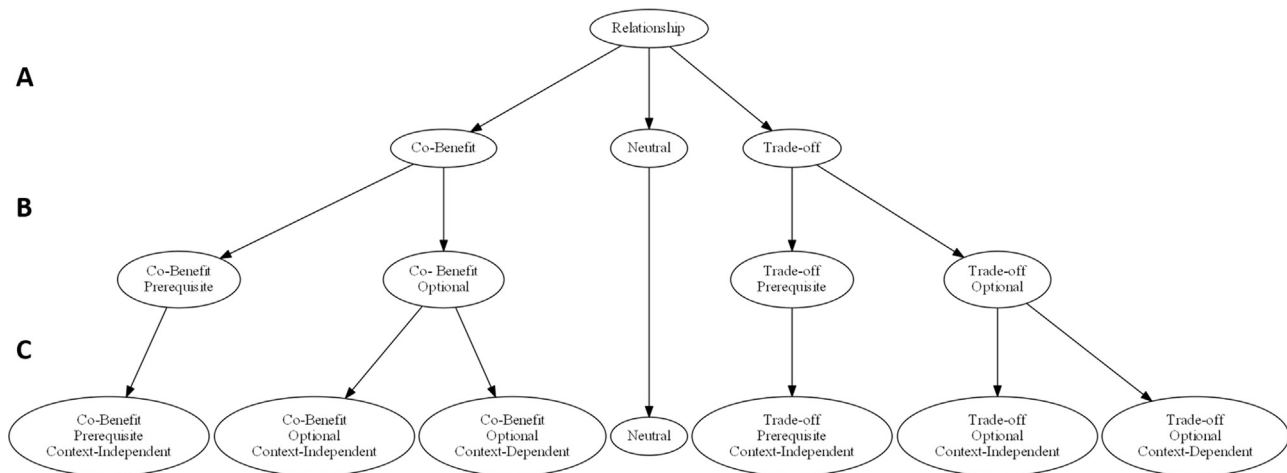
\* Corresponding author.

E-mail addresses: [g.singh@oceans.ubc.ca](mailto:g.singh@oceans.ubc.ca) (G.G. Singh), [a.cisneros@oceans.ubc.ca](mailto:a.cisneros@oceans.ubc.ca) (A.M. Cisneros-Montemayor), [wilf.swartz@gmail.com](mailto:wilf.swartz@gmail.com) (W. Swartz), [w.cheung@oceans.ubc.ca](mailto:w.cheung@oceans.ubc.ca) (W. Cheung), [adam.guy@plymouth.ac.uk](mailto:adam.guy@plymouth.ac.uk) (J.A. Guy), [tiff-annie.kenny@uottawa.ca](mailto:tiff-annie.kenny@uottawa.ca) (T.-A. Kenny), [chris.mcowen@unep-wcmc.org](mailto:chris.mcowen@unep-wcmc.org) (C.J. McOwen), [aschr16@ecu.edu](mailto:aschr16@ecu.edu) (R. Asch), [laurens.geffert@unep-wcmc.org](mailto:laurens.geffert@unep-wcmc.org) (J.L. Geffert), [c.wabnitz@oceans.ubc.ca](mailto:c.wabnitz@oceans.ubc.ca) (C.C.C. Wabnitz), [r.sumaila@oceans.ubc.ca](mailto:r.sumaila@oceans.ubc.ca) (R. Sumaila), [hanich@uow.edu.au](mailto:hanich@uow.edu.au) (Q. Hanich), [yota1@uw.edu](mailto:yota1@uw.edu) (Y. Ota).

<http://dx.doi.org/10.1016/j.marpol.2017.05.030>

Received 30 March 2017; Received in revised form 23 May 2017; Accepted 24 May 2017

0308-597X/© 2017 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).



**Fig. 1.** Hierarchical framework to characterize relationships among SDG targets. A) Compatibility of the relationship is determined (co-benefit, neutral, or trade-off). B) Relationships are considered “prerequisite” or “optional” if progress on the first target is needed to fulfill the second target, or not, respectively. C) The degree of confidence in relationships is determined. For relationships categorized as “context independent” there is high confidence that achieving a specific SDG target contributes to a co-benefit (or trade-off) with another; “context-dependent” indicates that the compatibility of the relationship is likely to be context-dependent.

and hunger, and promoting innovation and economic growth [3]. These goals resulted from international and interdisciplinary collaboration, and explicitly allow countries to determine their own context-appropriate strategies [3].

Among those goals, goal 14: Life Below Water (the “Oceans goal”) aims to “conserve and sustainably use the oceans, seas and marine resources for sustainable development”. Ocean targets comprise ecological and socioeconomic concerns, including reducing marine pollution (SDG 14.1); restoring marine habitat (SDG 14.2); reducing impacts of ocean acidification (SDG 14.3); eliminate overfishing as well as illegal, unreported and unregulated fishing (SDG 14.4); conserve marine areas (SDG 14.5); eliminate harmful fishing subsidies (SDG 14.6); and increase economic benefits to Small Island Developing States and least developed countries (SIDS, SDG 14.7). The current state of global oceans limits the potential to achieve far reaching sustainability objectives [4,5]. Realizing sustainable oceans has the potential to contribute to other sustainable development goals, though currently this SDG has the least identified progress [6], and has received the third lowest philanthropic funding [7].

The goals are presented independently. While their diversity and scale may seem prohibitive, these goals are in practice often inter-related and interdependent in social-ecological systems, meaning that progress on one can advance or impact a suite of others [8]. Relationships among goals can often be path-dependent, where achieving a certain SDG may contribute to another, but that relationship may not be true in reverse [8]. Relationships can also be characterized differently depending on the nature of the contribution [9]. In some cases, achieving an SDG target may be required to attain another SDG target [8]. For example, achieving sustainability of food production systems (SDG 2.4) requires the elimination of harmful fishing practices and overfishing (Target 14.4) [10]. In other cases, achieving a specific SDG target can contribute to but not be a prerequisite in realising a different target. For example, establishing effective marine protected areas (Target 14.5) may contribute to ecosystem restoration (Targets 14.2 and 15.5), but there are other ways that ecosystem restoration can be achieved [11]. Understanding the nature of such relationships, and their interdependencies, is required to show the interconnections between ocean and society and to indicate where SDG targets work in concert and co-benefit. This understanding potentially allows for greater return on management investment, or can indicate where SDG targets conflict, which can inform important decisions regarding trade-offs [8].

This paper introduces and operationalizes a framework for identifying the dependencies (co-benefits) and hindrances (trade-offs) among

directional relationships. This framework does not assume that a functioning biophysical environment is a necessary pre-requisite to support social and economic goals, as is central to some conceptual treatments of the relationships between economy, society, and environment [12], rather the framework allows for the possibility that ecological goals can be supported by social and economic concerns. Most importantly, this framework allows for an understanding of the prevalence of co-benefits versus trade-off relationships between ocean sustainability and other SDGs in particular settings. This framework was used to characterize the contribution of SDG 14 to other SDG targets globally. Additionally, we suggest that the framework can also be used to explore relationships between other SDG targets or similar multi-goal policies (e.g. the Convention on Biological Diversity’s Aichi Targets [13]), and could be modified to increase its relevance in specific contexts (such as national or regional scales).

## 2. Material and methods

There are 17 SDGs, with most including between 3 and 10 targets. Goals focus on environment (ocean and terrestrial), social justice (ending poverty, hunger, etc.), economy (creating meaningful jobs, sustainable economies), and infrastructure (cities and urban planning). The final goal (SDG 17, with 19 targets) focuses on creating international partnerships with the capacity to support the achievement of the other goals. Relationships between SDG targets (i.e. does one contribute or detract from another, and under what context) were mapped following a formal framework during a series of workshop sessions with subject experts (see Section 2.2 below).

### 2.1. SDG relationship evaluation framework

To assess the relationships between SDG targets, the framework presented here addresses three hierarchical considerations: the compatibility of the relationship (co-benefit, trade-off, neutral); the requirement of the first SDG target for the fulfillment of the second SDG target or not (prerequisite versus optional); and whether or not the compatibility of the relationship is confidently understood as independent of social-ecological context and implementation (context-independent versus context dependent, Fig. 1).

Below are some example relationships to illustrate the framework:

- *Co-benefit-prerequisite-context-independent*: Effectively regulating overfishing and destructive fishing practices (SDG 14.4) is required to achieve global resource efficiency (SDG 8.4);

Download English Version:

<https://daneshyari.com/en/article/7487969>

Download Persian Version:

<https://daneshyari.com/article/7487969>

[Daneshyari.com](https://daneshyari.com)