

## Policy pointers

**Development actors will** maximise their chances of achieving Sustainable Development Goal 14 (life below water) if they integrate complex systems theory into their planning, implementation and evaluation processes.

**By mapping and** evaluating the way SDG14 interacts with other development goals, decision makers will be better placed to prioritise, make trade-offs, manage risks and enable synergistic effects.

**Development actors** planning and evaluating progress in achieving SDG14 should think less in terms of specific projects and programmes, and more in terms of the systems they are trying to influence.

**The large-scale** transformational change needed to achieve the Sustainable Development Goals will require alignment between change agents who share a systems perspective.

## From monitoring goals to systems-informed evaluation: insights from SDG14

If the world is going to make significant progress towards achieving the Sustainable Development Goals (SDGs) by 2030, development actors will need to think and work in new ways, including in evaluation. We believe that complex systems-informed approaches can make a major contribution. With reference to SDG14 (life below water), this briefing offers two examples: (i) exploring interactions between SDG targets, and (ii) shifting attention from projects and programmes to systems. Such approaches can help all development actors — including monitoring, evaluation and learning specialists — to create boundary-spanning development and evaluation plans, identify leverage points, priorities and trade-offs, and reveal new ways to accelerate progress.

### Integration, transformation and cooperation: key messages in the 2030 Agenda

The 2030 Agenda for Sustainable Development warns that the world urgently needs to take 'bold and transformative' steps to achieve a sustainable, resilient future. The agenda also emphasises that the SDGs are 'integrated and indivisible': achieving them will hinge on making progress across the board, and failure or success in one goal will influence outcomes for the others.

Part of the reason that the world is not yet on track to realise the SDGs is that policies and plans, as well as monitoring, evaluation and learning (MEL) efforts, have often failed to recognise the systemic nature of the SDGs. The result: projects and programmes confined to silos that ignore the interactions within, between and around them.

In order to accelerate towards the kind of transformational progress needed to sustain healthy societies and Earth systems, all actors

need to adopt a more holistic, integrated approach. Development financiers, policymakers, strategic planners, implementation partners and MEL specialists must align, cooperate and work in new ways that can help bring about the radical, large-scale, sustainable change that 'transformation' implies. In this briefing, we show how aspects of a complex systems approach could apply to SDG14 (life below water, see Box 1).

### The importance and challenge of achieving SDG14

Achieving SDG14 will be essential for the success of the 2030 Agenda. Oceans and waterways often define and also transcend national boundaries. They help combat climate change, contribute to ecosystem diversity, enable cleaner energy, facilitate trade and create jobs. They will be crucial to the eradication of hunger and extreme poverty, particularly in Small Island Developing States (SIDS) and the Least Developed Countries (LDCs). More than

## More evolved forms of evaluation can support the realisation of the SDGs

three billion people's livelihoods depend on marine and coastal biodiversity, while the global market value of marine and coastal resources and industries is estimated at US\$3 trillion per year.<sup>1</sup>

The socio-economic significance of oceans and waterways means they will necessarily be influenced by initiatives aimed at advancing the other SDGs. The complex

nature of the linkages between oceans and waterways and land-based systems means that even trends affecting societies or ecosystems with no obvious connection to coastlines may nevertheless affect progress towards SDG14.

While many planning and monitoring efforts recognise the need to work across multiple biophysical, social, cultural, technological, political and economic boundaries, this level of integration can be hard to achieve in practice. Such complexity becomes much easier to navigate when development actors approach SDG-related initiatives from a complex (adaptive) systems<sup>2</sup> perspective, which would consider interactions between a wide range of institutions, relationships, policies, strategies, programmes, projects and so on. We believe that taking this kind of integrated approach will be essential to realising SDG14.<sup>3,4</sup>

### From siloed to systems thinking

Oceans and waterways are so interdependent that any policy or initiative must be based on an understanding of its likely impacts throughout an entire system. As such, policies cannot be based on siloed thinking or on the reductionist belief that everything can be studied in parts to understand the whole. Neither is it possible to implement an initiative without considering how it affects the wider system(s) in which it intervenes.

Programmes must also recognise the tendency of systems to return to their prior state, and that change pathways are seldom stable or predictable.

Nevertheless, many marine planners are still wedded to linear theories of change (ToCs) — which can be misleading in the context of oceans or waterways. Integrating multiple feedback loops may make ToCs more suitable for addressing complexity, but even these more sophisticated models often only capture a small spectrum of possible interactions.<sup>5</sup> Although it might be possible to predict certain patterns on the basis of a thorough understanding of the ecosystems and

societies concerned, predicting specific changes within a given timeframe still tends to be difficult, meaning there is only limited scope for engineering specific outcomes through results-based programmes.

Despite these limitations, many conventional results-based management practices — such as decisions to increase fishing quotas or set aside part of a coast as a protected area — consider only a few key variables. Working within such narrow confines is unlikely to bring about the necessary system-wide change.

Systems thinking offers a way out of these dilemmas. As an illustration, we briefly present two complex systems-informed approaches that can be used in the planning, implementation, monitoring and evaluation of efforts to achieve SDG14.

### 1. Working with the interactions between the SDGs to improve planning, monitoring and evaluation

Several recent studies provide real-world insights into the ways in which the SDG targets are interrelated and interdependent. A pioneering effort coordinated in 2016 by the International Science Council (then ICSU) identified seven types of interactions (Table 1).<sup>6</sup>

Le Blanc et al.,<sup>7</sup> Ntona and Morgera,<sup>8</sup> and Singh et al.<sup>9</sup> followed by focusing on SDG14 target interactions. Figure 1 shows the positive interactions that yield co-benefits based on such analyses (similar to +1 to +3 in Table 1); other analyses in a similar manner identify opposing (-1 to -3) interactions.

Considering the interactions between the SDG14 targets — and with other SDGs — has a number of important benefits: providing a useful starting point for integrated planning and implementation; indicating ways to accelerate progress towards achieving the SDGs; and encouraging coherence and alignment within and between organisations.

MEL efforts can provide essential support to such processes by highlighting (i) whether both positive and negative interactions have been appropriately considered in the design and sequencing of relevant initiatives; (ii) the extent to which such efforts are working and what can be improved; and (iii) key influencing and critical success factors — essential focuses for systems-informed approaches to change (see IIED's SDG14 handbook).<sup>10</sup>

**Identifying key priorities for action.** In Figure 1, the larger the circle, the greater the co-benefits between the SDG14 and other SDG targets — the higher the potential to be considered a priority. The analysis in Figure 1 clearly highlights that SDG1

#### Box 1. SDG14: life below water

Conserve and sustainably use the oceans, seas and marine resources for sustainable development.



protected areas in a particular area (SDG14.5) are likely to yield faster and better results than if they are implemented separately.<sup>13</sup>

## 2. Shifting (at least some) attention from projects and programmes to systems

Working with the interconnectedness between problems and solutions across geographic, sector, issue, stakeholder and project boundaries requires:

- Moving away from a preoccupation with projects and programmes as evaluands to systems
- Using systemic approaches to evaluation that connect the global and local, the macro and the micro, and study the relationships between worldwide patterns and area-specific challenges.

Such evaluations are still rare. The best illustrative example is found outside SDG14. The global initiative 'The Economics of Ecosystems and Biodiversity' (TEEB) offers an integrated, systems-based, complexity-informed evaluation as an alternative to the conventional practice of monitoring siloed indicators and evaluating specific projects and programmes.<sup>14</sup> Applied to food systems, the initiative uses a holistic TEEB AgriFood Evaluation Framework that includes multiple evaluations of agriculture and food systems along their production and consumption value chains.

Applied in the context of SDG14, this kind of integrated approach could create one or more frameworks to evaluate interconnected systems.

Where the necessary capacity is still being developed, conventional evaluations of projects and programmes could adopt a complex systems perspective. Although not all systems-oriented evaluations need to be as ambitious as TEEB, the initiative shows how more evolved forms of evaluation can support the realisation of the SDGs.

## Embracing complex systems thinking

Integrating complex systems-informed approaches into efforts to achieve the SDGs will require innovative processes and new relationships. Development and evaluation actors will need to 'scale deep' — experiment with new approaches that respect different values and contexts, yet are sufficiently aligned to deliver mutually reinforcing effects. Achieving this will require new and more intensive ways of engaging across multiple disciplinary, ideological, sector, governance and country boundaries, but the effort will be worthwhile. If reaching the SDGs can seem like a daunting challenge, this more expanded vision of planning and evaluation could be one of the keys to unlocking truly transformational change.

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## Knowledge Products

The International Institute for Environment and Development (IIED) promotes sustainable development, linking local priorities to global challenges.

EVALSDGs is a network of policymakers, institutions, and practitioners who advocate for effective evaluation for the SDGs.

EvalPartners is a global partnership that aims to influence policymakers, public opinion and other stakeholders so evaluative evidence is valued and used.

The Nippon Foundation Nereus Program is a global partnership of 17 leading institutes working to advance our comprehensive understanding of the global human-ocean system across the natural and social sciences.

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## Notes

<sup>1</sup> UNCTAD (2015) The oceans economy: a formidable asset for the advancement of sustainable development. [https://unctad.org/en/PublicationsLibrary/ditc2015misc5\\_en.pdf](https://unctad.org/en/PublicationsLibrary/ditc2015misc5_en.pdf) / <sup>2</sup> Basic explanation in: <https://medium.com/@junp01/an-introduction-to-complexity-theory-3c20695725f8>; see also: [www.cecan.ac.uk/index.php/news/visual-representation-of-complexity](http://www.cecan.ac.uk/index.php/news/visual-representation-of-complexity) / <sup>3</sup> Hagstrom, GI and Levin, SA (2017) Marine Ecosystems as Complex Adaptive Systems: Emergent Patterns, Critical Transitions, and Public Goods. *Ecosystems* 20:3, 458–476. / <sup>4</sup> Patton, MQ (2011) Applying Complexity Concepts to Enhance Innovation and Use. Guilford Press, New York, pp 1–373. / <sup>5</sup> Davies, R (2018) Representing Theories Of Change: Technical Challenges With Evaluation Consequences. CEDIL Inception Paper 15. <https://cedilprogramme.org/publications/inception-papers> / <sup>6</sup> Griggs, D, Nilsson, M, Stevance, A-S and McCollum, D (2016) A Guide to SDG Interactions: From Science to Implementation. The International Council for Science. <https://council.science/publications/a-guide-to-sdg-interactions-from-science-to-implementation> / <sup>7</sup> Le Blanc, D, Freire, C, Vierros, M (2017) Mapping the linkages between oceans and other Sustainable Development Goals: A preliminary exploration. DESA Working Paper No. 149. [https://sustainabledevelopment.un.org/content/documents/12468DESA\\_WP149\\_E.pdf](https://sustainabledevelopment.un.org/content/documents/12468DESA_WP149_E.pdf) / <sup>8</sup> Ntona, M and Morgera, E (2018) Connecting SDG 14 with the other sustainable development goals through marine spatial planning. Law, Society & Policy. University of Strathclyde. <https://pureportal.strath.ac.uk/en/publications/connecting-sdg-14-with-the-other-sustainable-development-goals-th> / <sup>9</sup> Singh, G, Cisneros-Montemayor, A, Swartz, W, Cheung, W, Guy, JA, Kenny, T-A, McOwen, C, Asch, R, Geffert, J, Wabnitz, C, Sumaila, R, Hanich, Q and Ota, Y (2018) A rapid assessment of co-benefits and trade-offs among Sustainable Development Goals. *Marine Policy*, 93: 223–231. <https://nereusprogram.org/works/co-benefits-and-trade-offs-in-sdg14> / <sup>10</sup> Lucks, D, Burgass, M, Lynn, I, Piergallini, I, Beauchamp, E (2019) MEL Handbook for SDG 14. IIED, London. <https://pubs.iied.org/16644IIED> / <sup>11</sup> Singh, G, personal communication, 22 February 2019. / <sup>12</sup> Meadows, D (1999) Leverage Points: Places to Intervene in a System. The Sustainability Institute. <http://donellameadows.org/archives/leverage-points-places-to-intervene-in-a-system> / <sup>13</sup> Halle, M (10 December 2018) Getting Serious: taking Nature Conservation to Stage Three. [www.transformationsforum.net/getting-serious-taking-nature-conservation-to-stage-three](http://www.transformationsforum.net/getting-serious-taking-nature-conservation-to-stage-three) / <sup>14</sup> The Economics of Ecosystems and Biodiversity (TEEB) (2018) Measuring what matters in agriculture and food systems: a synthesis of the results and recommendations of TEEB for Agriculture and Food's Scientific and Economic Foundations report. UN Environment. [http://teebweb.org/agrifood/wp-content/uploads/2018/10/Layout\\_synthesis\\_sept.pdf](http://teebweb.org/agrifood/wp-content/uploads/2018/10/Layout_synthesis_sept.pdf) / <sup>15</sup> Nilsson, M, Chisholm, E, Griggs, D, Howden-Chapman, P, McCollum, D, Messerli, P, Neumann, B, Stevance, A-S, Visbeck, M and Stafford-Smith, M (2018) Mapping interactions between the sustainable development goals: lessons learned and ways forward. *Sustain Sci* (2018) 13: 1489. / <sup>16</sup> Nippon Foundation-Nereus Program (2017) Oceans and Sustainable Development Goals: Co-benefit, Climate Change and Social Equity. <https://nereusprogram.org/reports/report-oceans-and-sustainable-development-goals-co-benefits-climate-change-and-social-equity>