Sustainable Development Goals (SDG) Interlinkages Analysis and Visualisation

A practical tool supporting SDG integration and policy coherence

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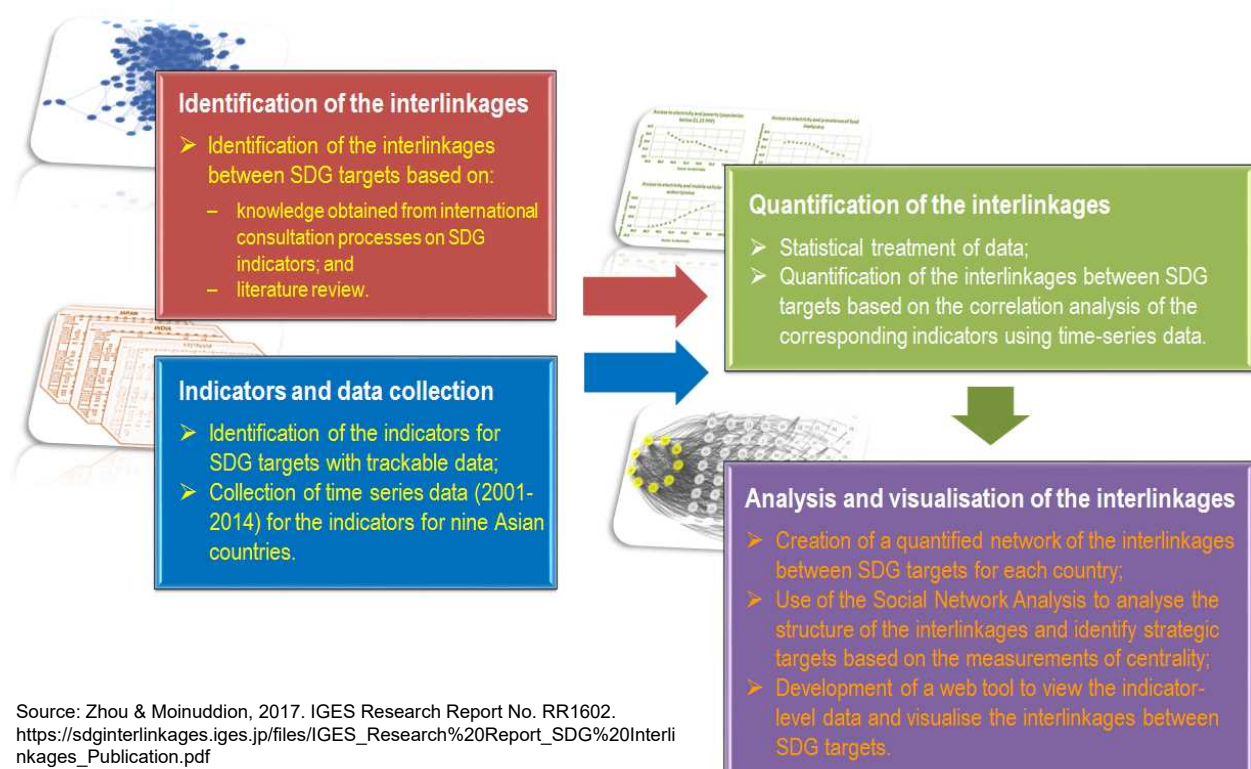**IGES**
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The SDGs: 17 Goals, 169 Targets and 232 Indicators forming an integrated and indivisible framework for delivering sustainability from a systemic perspective.

Importance of understanding SDG interlinkages for breaking the silos and for SDG integration

- ➢ The nature of indivisibility of SDGs requires a systems approach based on SDG interlinkages from both theoretical and practical perspectives.
- ➢ SDG integration has been highly recognised through out the negotiation process of SDGs formation as well as in the planning and reporting processes (VNRs).
- ➢ Understanding the interlinkages within and between SDGs is important for SDG integration to address critical issues such as:
  - *How will achieving one target impact on achieving other targets?*
  - *How strong are the impacts?*
  - *Which targets play strategic roles in the network of interlinkages?*
  - *Where are the areas of SDG synergies or trade-offs?*
  - *How countries are different in terms of SDG interlinkages, etc.*

IGES SRF Project: SDG Interlinkages Analysis and Visualization Tool (Version 1)

Identification of the interlinkages
- ➢ Identification of the interlinkages between SDG targets based on:
  - knowledge obtained from international consultation processes on SDG indicators; and
  - literature review.

Indicators and data collection
- ➢ Identification of the indicators for SDG targets with trackable data;
- ➢ Collection of time series data (2001-2014) for the indicators for nine Asian countries.

Quantification of the interlinkages
- ➢ Statistical treatment of data;
- ➢ Quantification of the interlinkages between SDG targets based on the correlation analysis of the corresponding indicators using time-series data.

Analysis and visualisation of the interlinkages
- ➢ Creation of a quantified network of the interlinkages between SDG targets for each country;
- ➢ Use of the Social Network Analysis to analyse the structure of the interlinkages and identify strategic targets based on the measurements of centrality;
- ➢ Development of a web tool to view the indicator-level data and visualise the interlinkages between SDG targets.

Source: Zhou & Moinuddion, 2017. IGES Research Report No. RR1602.
https://sdginterlinkages.iges.jp/files/IGES_Research%20Report_SDG%20Interlinkages_Publication.pdf

IGES SDG Interlinkages and Data Visualisation Web Tool (free online at https://sdginterlinkages.iges.jp/)

Source: A snapshot taken from IGES SDG Interlinkages and Data Visualisation Web Tool for Japan.

The dashboards for Japan indicating potential reinforcing (green) and conflicting (red) interlinkages
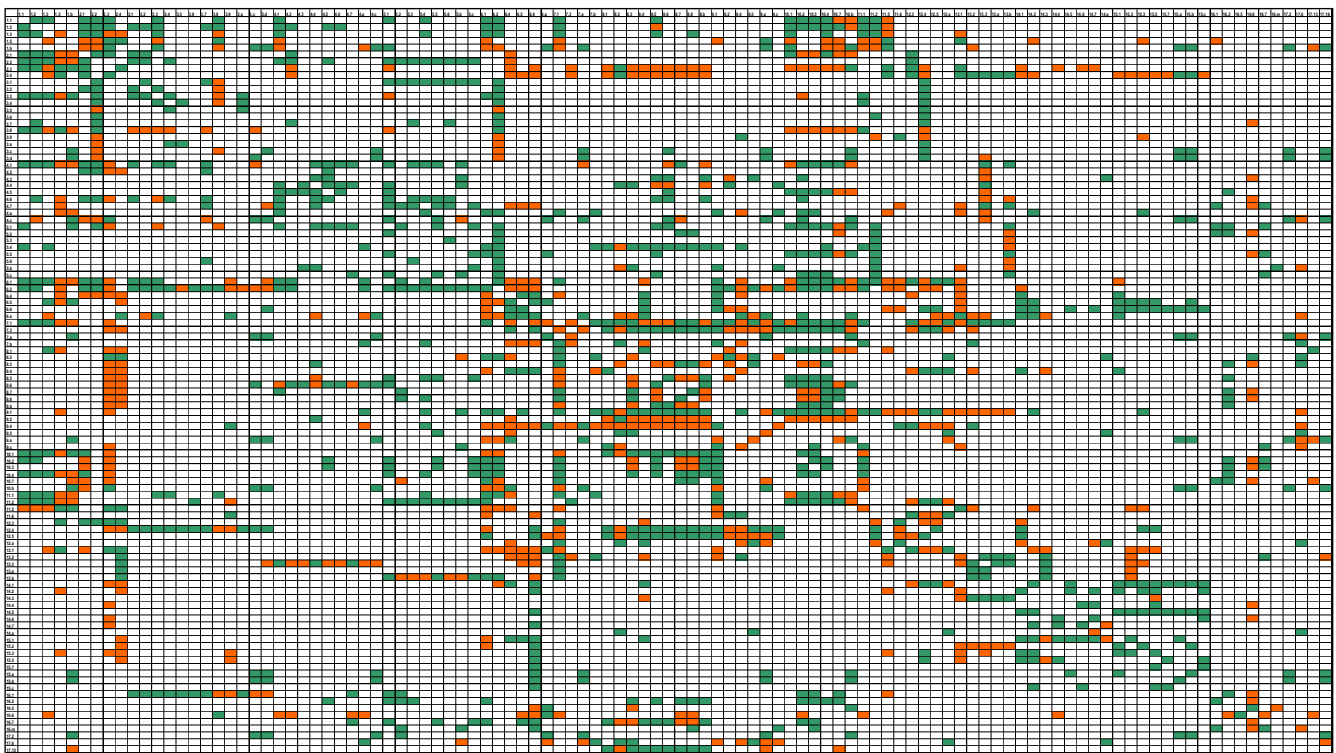
Source: Zhou & Moinuddion, 2017. IGES Research Report No. RR1602.
https://sdginterlinkages.iges.jp/files/IGES_Research%20Report_SDG%20Interlinkages_Publication.pdf

By ranking various centrality metrics strategic targets are identified

Rank	In-degree	Out-degree	Degree	Closeness	Eigenvector	Betweenness
1	6.2	6.2	6.2	15.7	2.3	6.2
2	2.3	9.1	7.1	15.c	7.1	12.4
3	6.1	7.1	6.1	14.a	6.1	2.3
4	7.1	6.1	2.3	14.5	10.2	6.6
5	10.2	12.4	9.1	14.6	10.4	2.4
6	6.6	2.4	12.4	14.4	6.2	7.1
7	10.3	2.3	2.4	14.7	10.3	6.1
8	10.4	4.1	6.6	14.3	9.1	9.1
9	8.5	6.a	10.2	5.3	8.5	16.6
10	10.b	7.3	1.b	9.5	10.7	1.b
11	2.4	9.4	5.1	5.6	1.5	13.3
12	9.1	1.b	10.4	15.b	8.3	11.2
13	12.4	5.1	10.3	13.a	2.1	2.2
14	8.3	11.2	4.1	3.a	8.7	5.1
15	10.7	1.2	9.4	3.5	8.8	8.6
16	1.b	6.6	8.5	3.6	2.4	6.a
17	6.4	12.5	11.2	3.2	10.b	8.2
18	2.2	4.c	2.2	14.2	6.4	5.b
19	5.1	4.6	1.5	3.4	8.b	10.b
20	1.5	10.2	10.b	15.5	11.1	13.b

Source: Zhou & Moinuddion, 2017. IGES Research Report No. RR1602.
https://sdginterlinkages.iges.jp/files/IGES_Research%20Report_SDG%20Interlinkages_Publication.pdf

Country specific leverage points identified which help priority setting and efficient resource allocation

- In the network of SDG interlinkages, different targets have varying degrees of **leverage—the extent to which they influence other targets**

- For example, **Target 12.4** (Chemicals and wastes management) is connected with more targets than **Target 14.4** (End overfishing), suggesting it will influence more SDGs.

- Preliminary results indicate that Targets **9.1** on resilient infrastructure, **6.6** on protecting water ecosystems, **15.a** on financial resources for sustainable ecosystems in **JPN**, Targets **2.3** on doubling agriculture productivity, **7.1** on energy accessibility, **12.4** on chemicals and wastes management in **PHL**, and Targets **10.2** on social, economic and political inclusion, **10.3** on discrimination, and **12.4** on chemicals and wastes management in **KHM** are strategic targets.

- Setting strategic targets as priorities helps maximize synergies, minimize trade-offs and in particular optimize limited resources in developing countries.
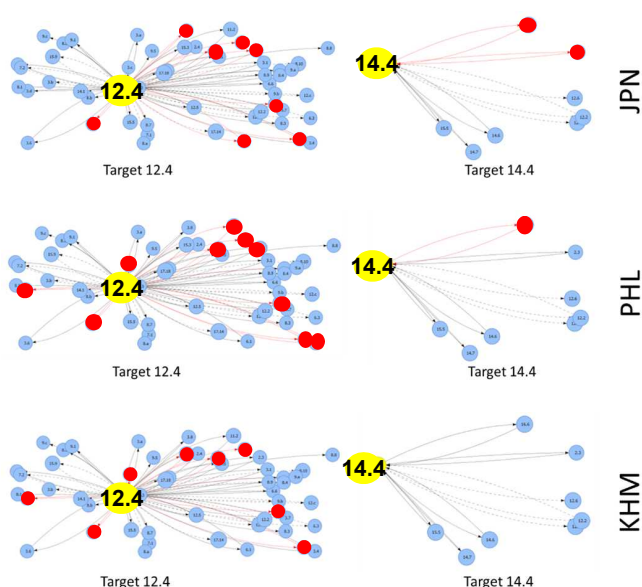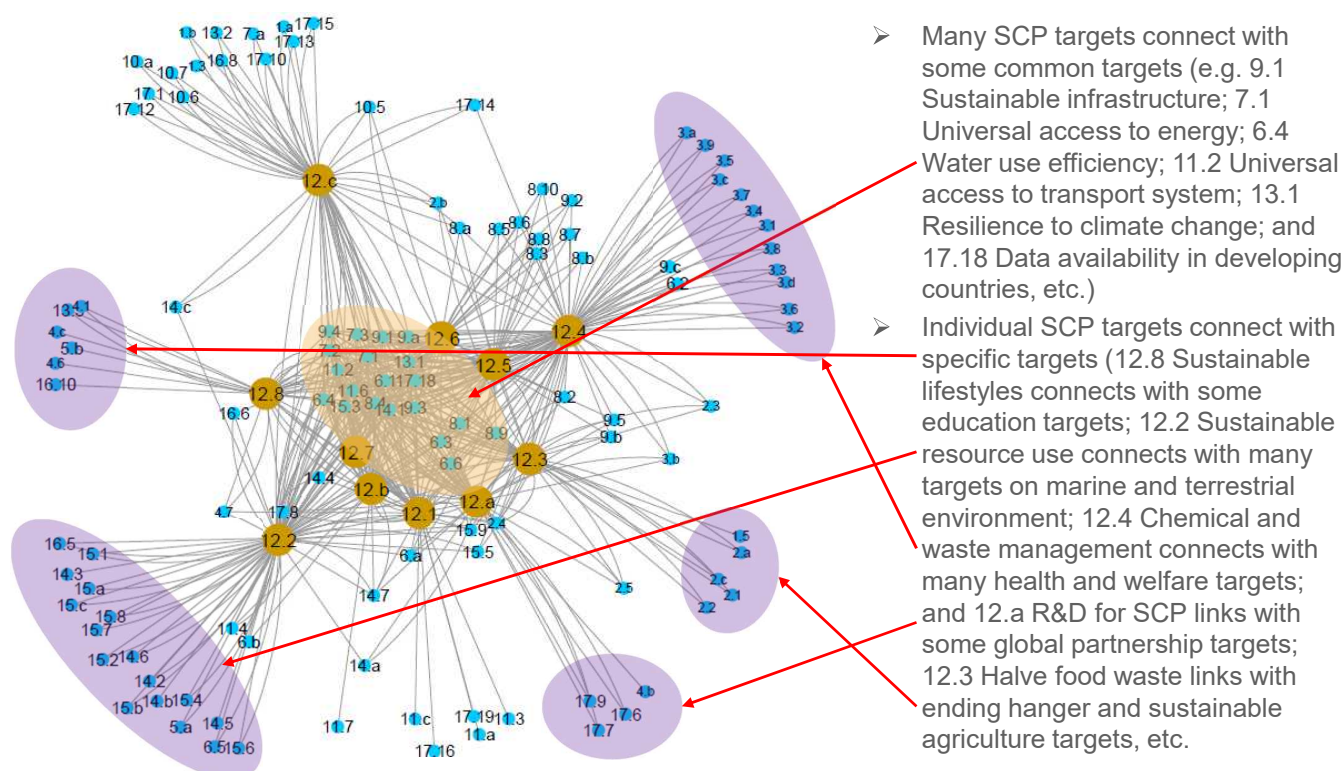

Source: Snapshots taken from IGES SDG Interlinkages and Data Visualisation Web Tool (https://sdginterlinkages.iges.jp/).

## A systems approach for achieving SCP based on life-cycle thinking and interactions with other targets
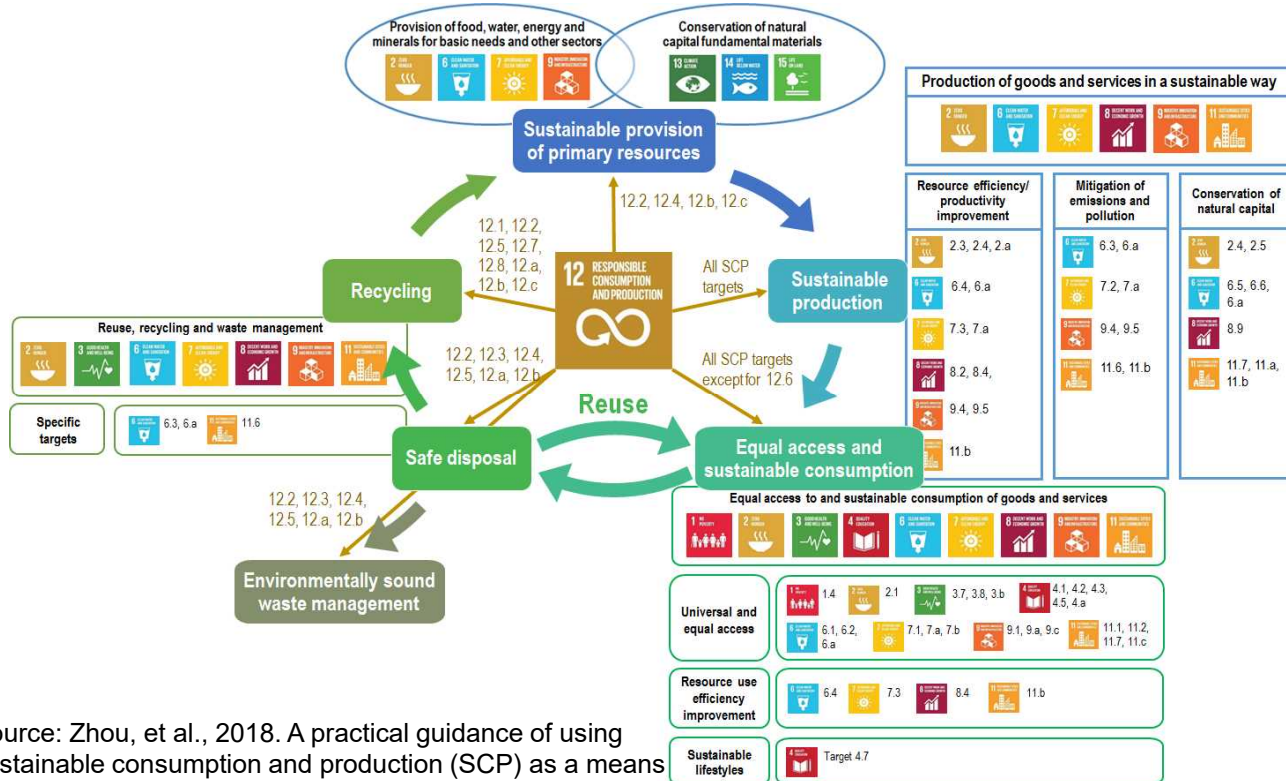
Source: Zhou, et al., 2018. A practical guidance of using sustainable consumption and production (SCP) as a means for achieving SDGs. In IGES flagship report (forthcoming).

Visualisation of SCP interlinkages with other SDG targets in a network of connections

➤ Many SCP targets connect with some common targets (e.g. 9.1 Sustainable infrastructure; 7.1 Universal access to energy; 6.4 Water use efficiency; 11.2 Universal access to transport system; 13.1 Resilience to climate change; and 17.18 Data availability in developing countries, etc.)

➤ Individual SCP targets connect with specific targets (12.8 Sustainable lifestyles connects with some education targets; 12.2 Sustainable resource use connects with many targets on marine and terrestrial environment; 12.4 Chemical and waste management connects with many health and welfare targets; and 12.a R&D for SCP links with some global partnership targets; 12.3 Halve food waste links with ending hanger and sustainable agriculture targets, etc.

Source: Zhou, X., et al. 2018. IGES flagship report chapter (forthcoming).

Features of the quantified SCP interlinkages with other SDG targets: An example in Indonesia
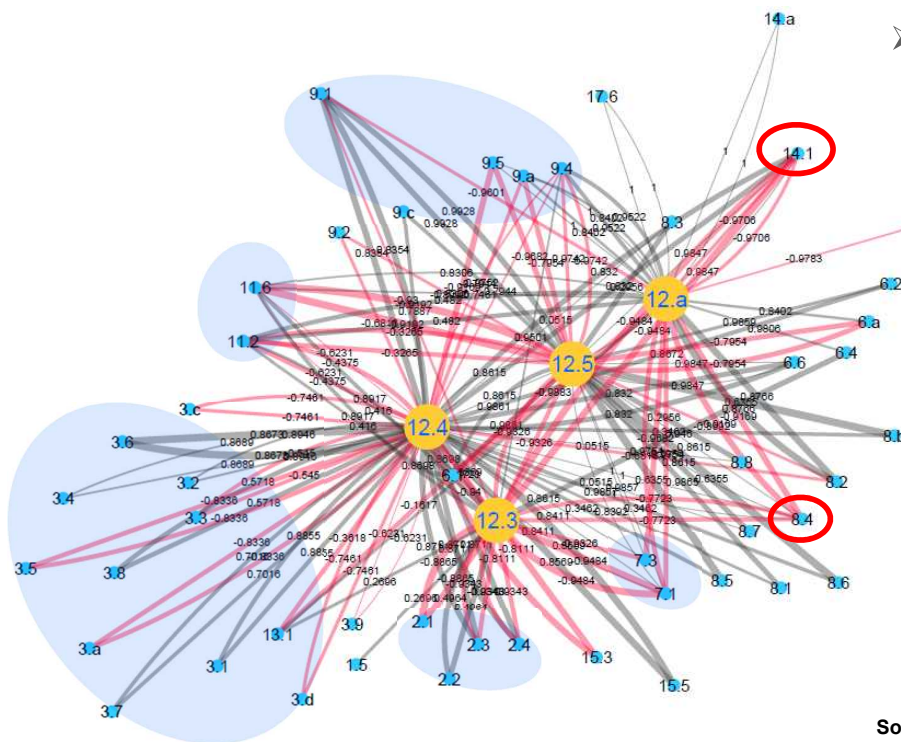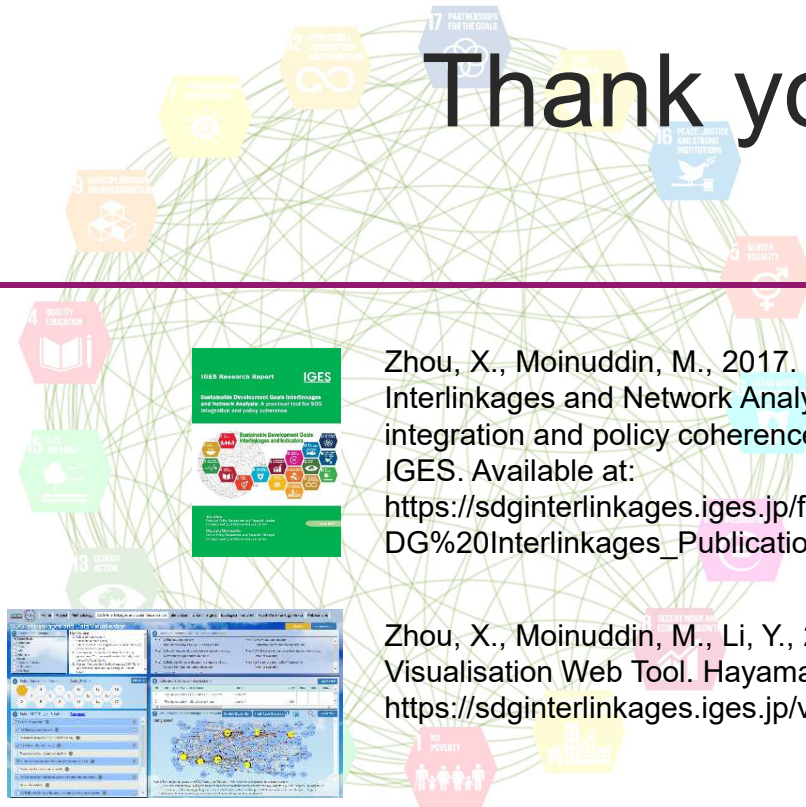

> ➢ **Major existing conflicts**
> - Goal 2 Zero hanger
> - Goal 3 Health and well-being
> - Goal 7 Affordable and clean energy
> - Goal 9 Industrial, innovation and infrastructure
> - Goal 11 Sustainable cities
> - 8.4 Improve resource efficiency
> - 14.1 Reduce marine pollution

Source: Zhou, X., et al. 2017. JSPS proposal.

Using the SDG interlinkages tool for SDG integration at different stages of the policy cycle

Planning: Help priority setting based on strategic SDG targets and provide checklists for conducting SEA/SA of national development plans and sectoral programmes.

Institution: Review of the existing institutional arrangement (VNR) and propose effective institutional arrangement based on SDG interlinkages

Financing: Support efficient allocation based on the synergies to avoid overlapping and effective allocation to ensure the trade-offs be addressed.

Monitoring and reporting: Help check the quality of indicators, development of headline indicators and support SDG integration monitoring.

Thank you!

Zhou, X., Moinuddin, M., 2017. Sustainable Development Goals Interlinkages and Network Analysis: A practical tool for SDG integration and policy coherence. IGES Research Report. Hayama: IGES. Available at: https://sdginterlinkages.iges.jp/files/IGES_Research%20Report_SDG%20Interlinkages_Publication.pdf.

Zhou, X., Moinuddin, M., Li, Y., 2017. SDG Interlinkages and Data Visualisation Web Tool. Hayama: IGES. Available at: https://sdginterlinkages.iges.jp/visualisationtool.html.

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