

This is not an ADB material. The views expressed in this document are the views of the author/s and/or their organizations and do not necessarily reflect the views or policies of the Asian Development Bank, or its Board of Governors, or the governments they represent. ADB does not guarantee the accuracy and/or completeness of the material's contents, and accepts no responsibility for any direct or indirect consequence of their use or reliance, whether wholly or partially. Please feel free to contact the authors directly should you have queries.

Sustainable Development Goals (SDG) Interlinkages Analysis and Visualisation

*A practical tool supporting SDG integration and
policy coherence*

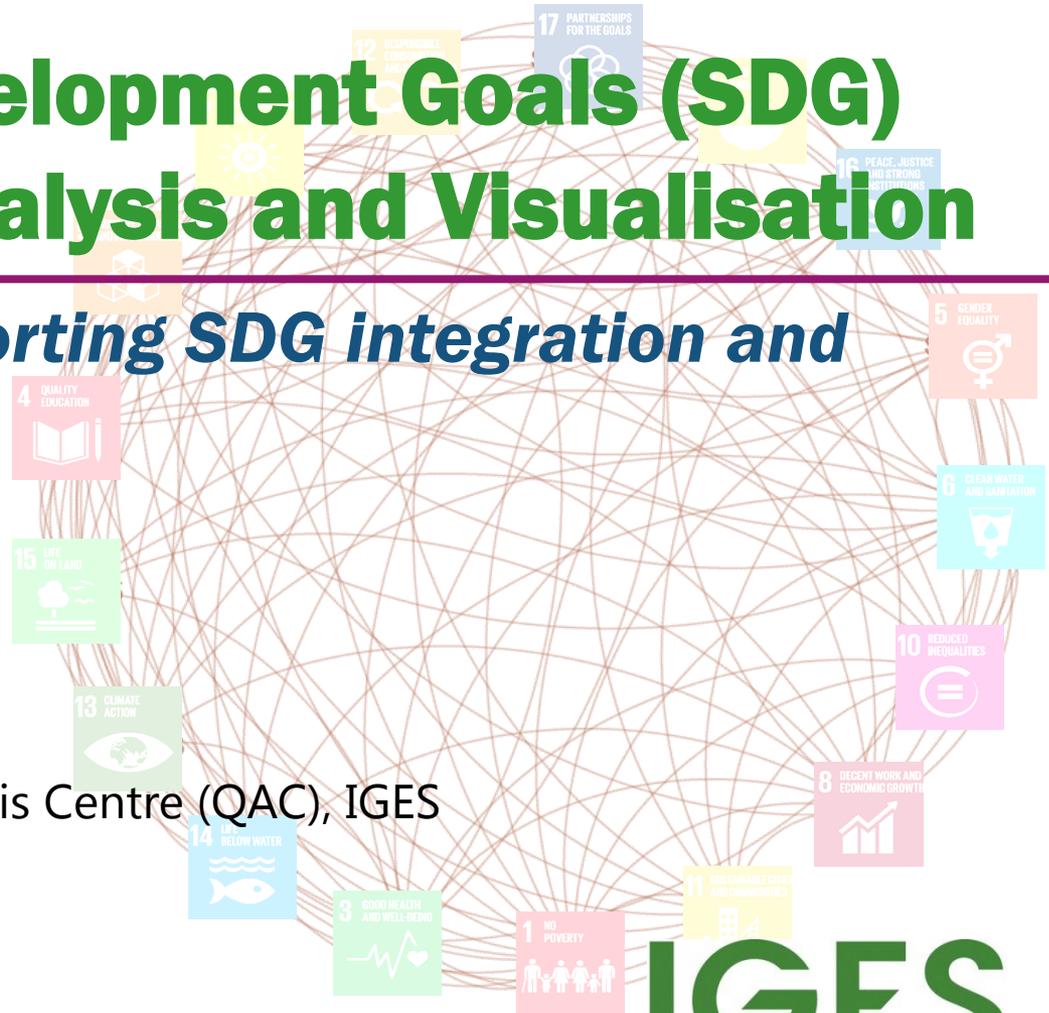
Dr. Xin Zhou

Research Leader

Strategic and Quantitative Analysis Centre (QAC), IGES

***Regional Knowledge Sharing Workshop, organised by ADB, UN
Environment and ESCAP, 21-22 February 2018, UNCC, Bangkok***

IGES
Institute for Global
Environmental Strategies



Importance of SDG interlinkages analysis and existing knowledge gaps for SDG integration

- 17 SDGs and 169 targets inherently connect with each other forming an indivisible network for delivering sustainability from a systemic perspective.
- SDG integration has been highly recognised through out the negotiation process of SDGs formation as well as in the planning and reporting processes.
- 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?*
 - *Where are the areas of SDG synergies or trade-offs?*
 - *How countries are different in terms of SDG interlinkages, etc.*

IGES' innovative and practical tool on SDG interlinkages analysis and visualisation

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.

IGES SDG Interlinkages and Data Visualisation Web Tool Version 1.0 (free access at <https://sdginterlinkages.iges.jp/>)

1 Select One Country

User can select a country from here.

2 Select Sustainable Development Goals (SDGs)

User can select Goals from here.

3 Select SDG Targets & Indicators

User can select Targets from here.

4 For example, here we selected Japan, Goal 13 on climate action and Target 13.2 on integrating climate change measures into national policies. Target 13.2 has potential synergies with many targets of Goal 7 (energy) and other targets under Goal 13 but possible trade-offs with some targets of Goal 8 (jobs and growth), Goal 9 (Industry and infrastructure) and Goal 6 (water and sanitation).

6 Visualisation of interlinkages in a network

Economic targets

Social targets

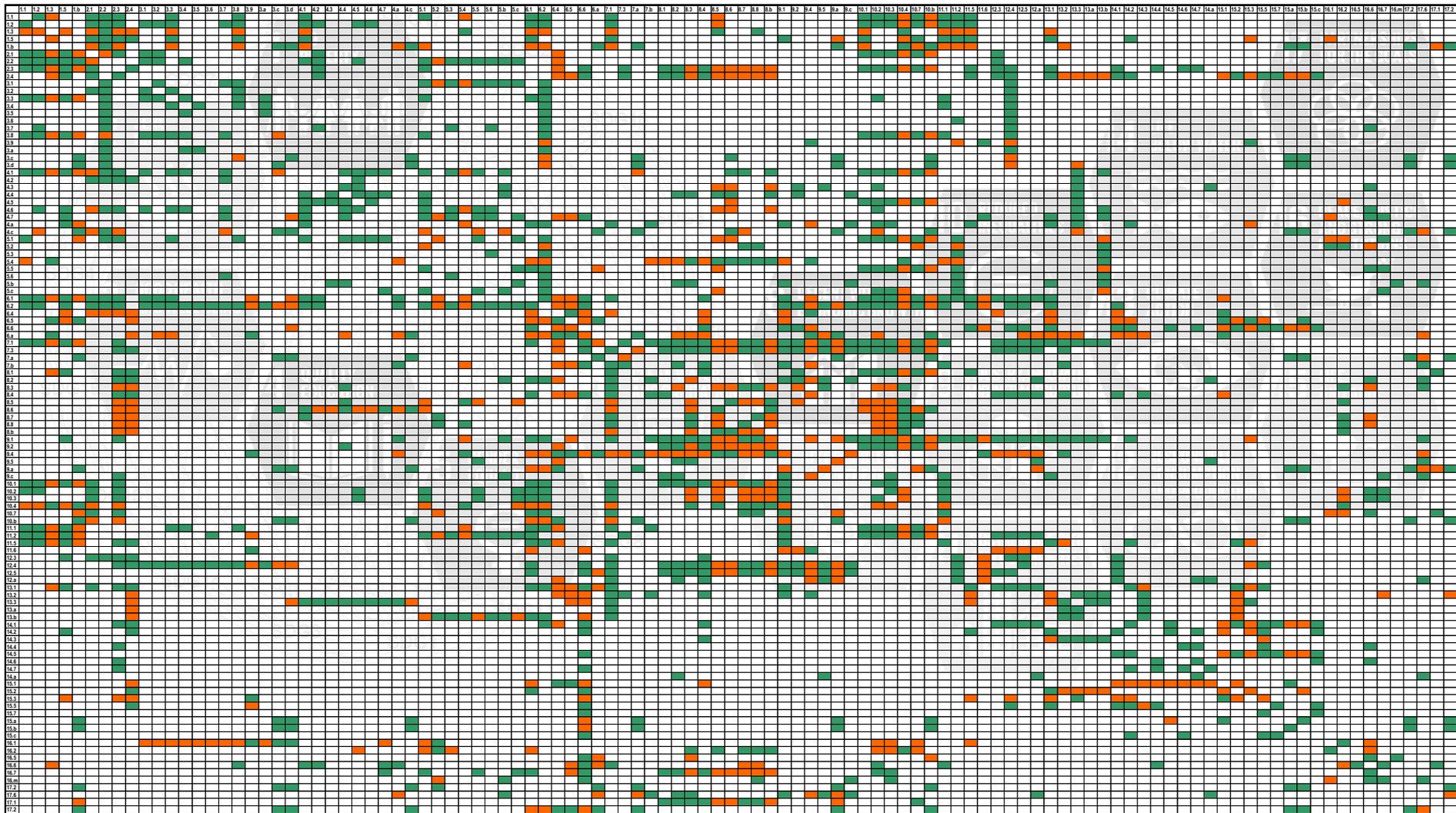
Means of implementation

Other environmental targets

Note: i) Each node represents one SDG Target, e.g. Target 1.1, with yellow ones indicating the selected target.
 ii) Each line with an arrow linking two nodes represents a directional/causal link between two Targets, e.g. from Target 1.1 to Target 1.2. The value over the line (by putting the cursor on the line) indicates the strength of the linear relationship between the pair of targets.
 iii) A line in black represents a positive link and a line in red represents a negative link.

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

Country-specific dashboards indicating potential reinforcing (green) and conflicting (red) linkages



Bangladesh

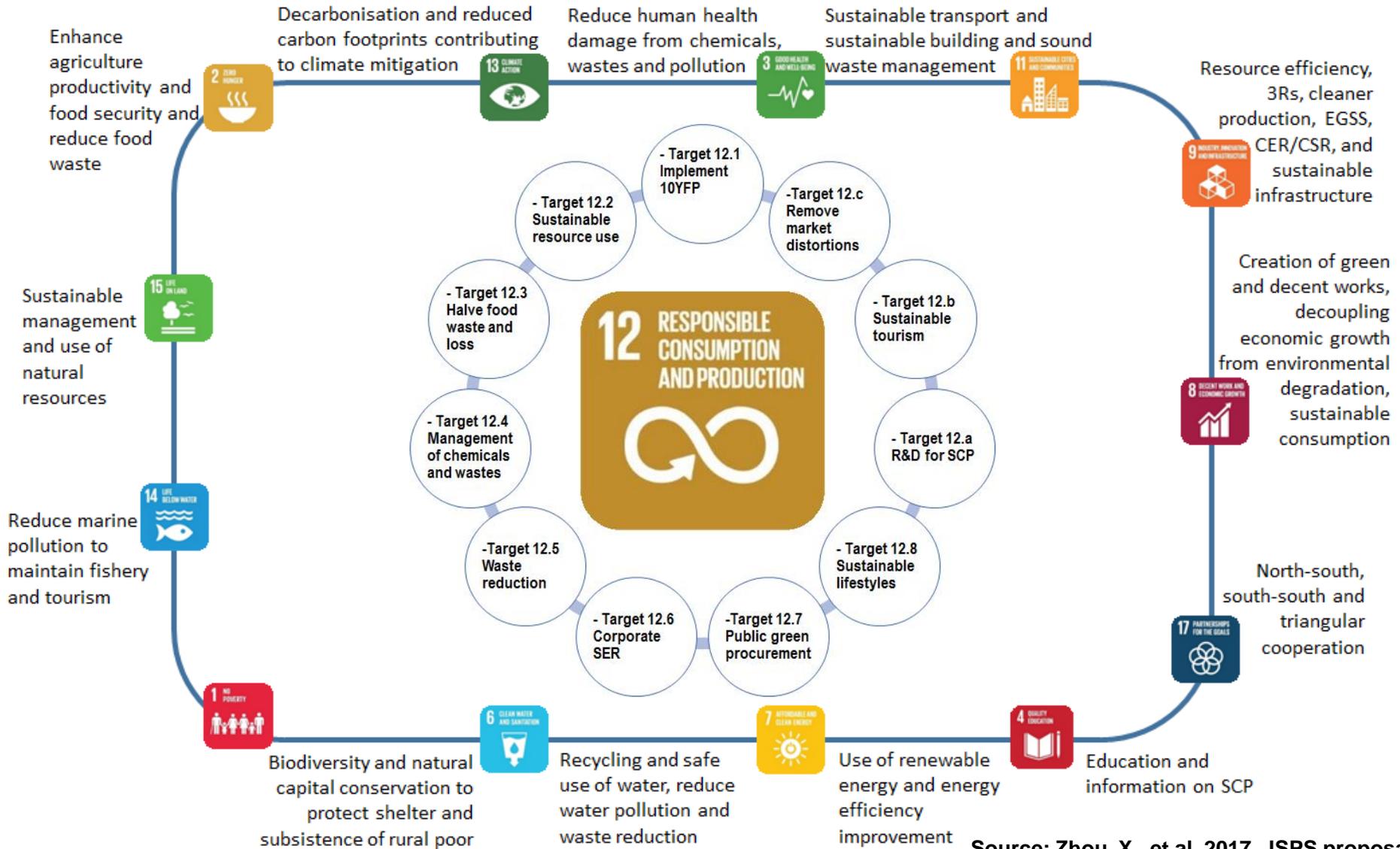
Using Social Network Analysis techniques, ranking various centrality metrics help identify strategic SDG targets

| 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 & Moinuddin, 2017. IGES Research Report No. RR1602.

https://sdginterlinkages.iges.jp/files/IGES_Research%20Report_SDG%20Interlinkages_Publication.pdf

A conceptual framework of Goal 12 as an overarching theme links extensively with other goals and targets



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

Applications of the tool for SDG integration



Thank you!

Contact: zhou@iges.or.jp



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>.