

Prioritisation of SDGs in the national development plan using IGES SDG Interlinkages Tool

- Case studies in Lao PDR, Ethiopia and Tanzania

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Technical workshop on analytical tools for capacity building on quantitative methods for SDG interactions and integration in national development strategies and integrated planning

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The SDGs: 17 Goals, 169 Targets and 232 indicators form an integrated and indivisible framework for achieving sustainable development from a systemic perspective



Importance of taking an integrated approach for SDGs planning and implementation through an interlinkage perspective

- Shifting from a siloed approach to an integrated approach is imperative for achieving the SDGs.
- Understanding the interlinkages between SDG targets is important for taking an integrated approach which helps address the following issues:



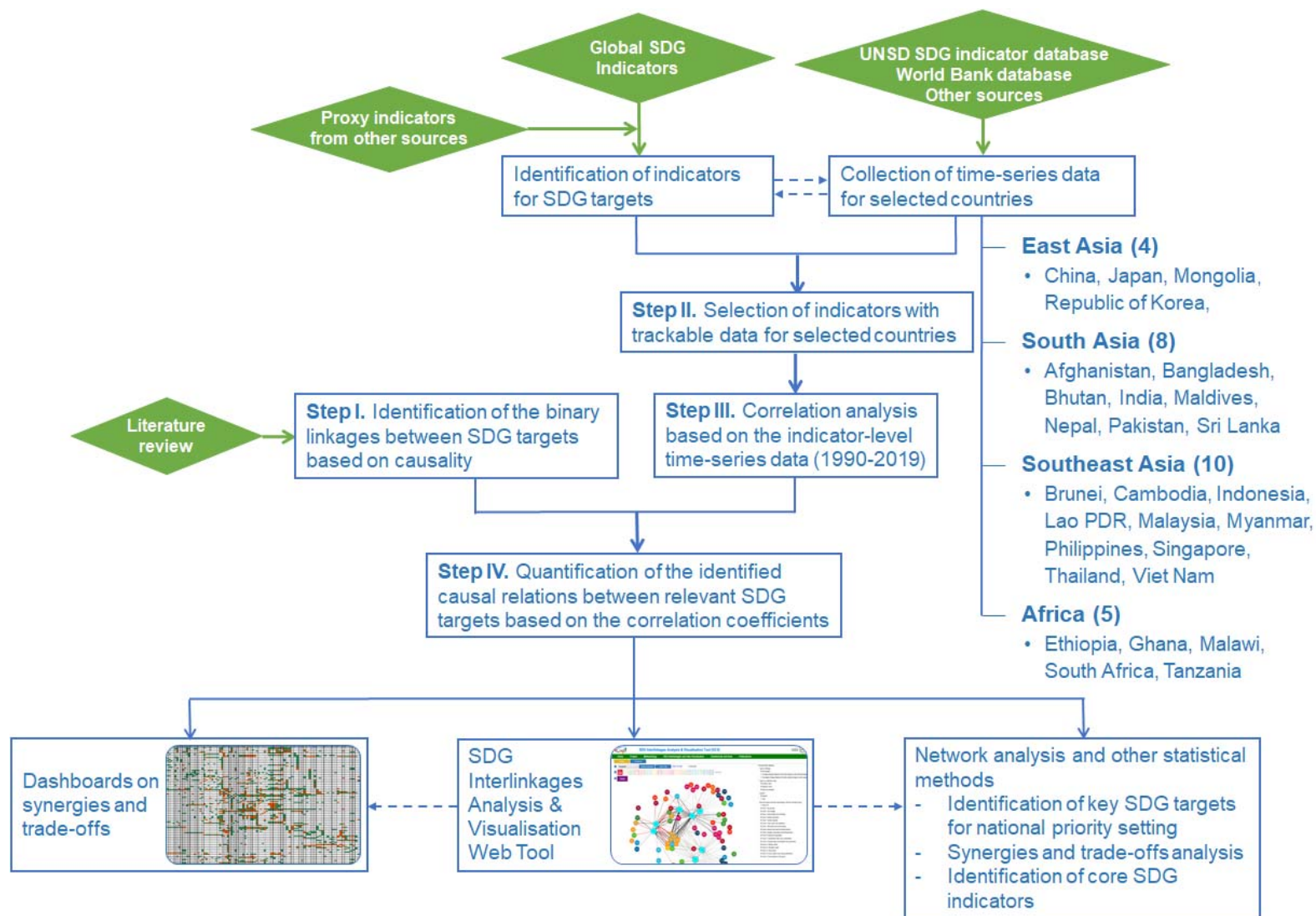
A siloed approach cutting off the interlinkages



An integrated approach through SDG interlinkages

- *How will achieving one target impact on achieving others and how strong are the impacts?*
- *Where are the synergies or trade-offs between the SDG targets?*
- *How countries are different in terms of SDG interlinkages?*
- *What are the policy implications for priority setting and institutional and financial arrangement, etc.*

IGES project on SDG interlinkages and indicators (2015 – present): A methodology on SDG interlinkages analysis



Source: A screenshot taken from <https://sdginterlinkages.iges.jp/methodology.html> (Zhou, et al., 2019)

IGES SDG Interlinkages Analysis & Visualisation Tool (V3.0)

(<https://sdginterlinkages.iges.jp/visualisationtool.html>)



SDG Interlinkages Analysis & Visualisation Tool (V3.0)



Home Project Methodology SDG Interlinkages and Data Visualisation Dashboards and Data Publications

1

▼ Ethiopia

Detailed Explanation

Export Chart

Edit mode i

How To Use Visualisation Options

2

3

Apply

Select all

Types of linkage

- All linkages
- Out-degree linkages (directed links pointing from the selected target to other targets)
- In-degree linkages (directed links pointing from other targets to the selected target)

Positive/Negative linkages

- Positive linkages (synergies)
- Negative linkages (trade-offs)
- Data not available

Layouts

- Default
- Grid

Line thickness levels for the strength of the linkages

2

Selected targets and their interlinkages with the following goals

- Select all
- Goal 1. No poverty
- Goal 2. Zero hunger
- Goal 3. Good health and well-being
- Goal 4. Quality education
- Goal 5. Gender equality
- Goal 6. Clean water and sanitation
- Goal 7. Affordable and clean energy
- Goal 8. Decent work and economic growth

Source: A screenshot taken from the SDG Interlinkages Analysis and Visualisation Web Tool (Zhou, et al., 2019)

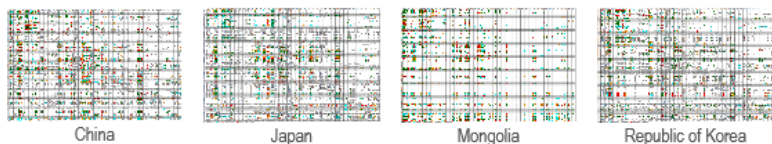
Dashboards on the potential positive and negative linkages between SDG targets for 27 countries



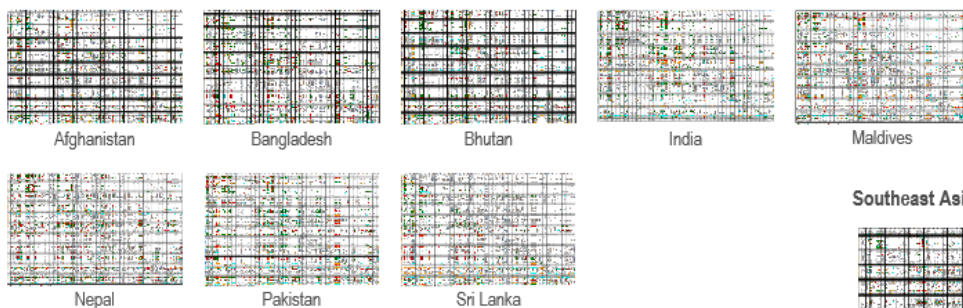
SDG Interlinkages Analysis & Visualisation Tool (V3.0)



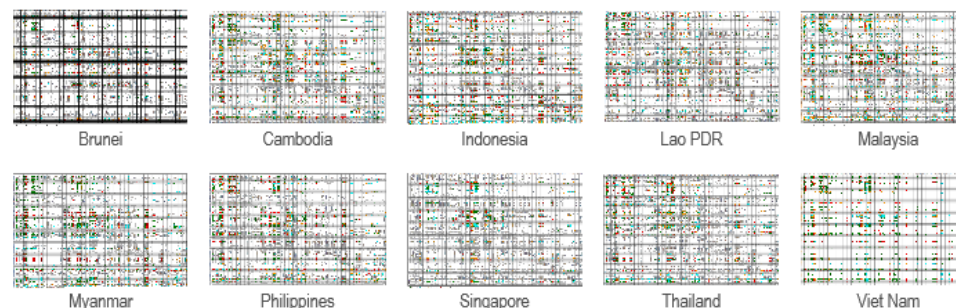
East Asia:



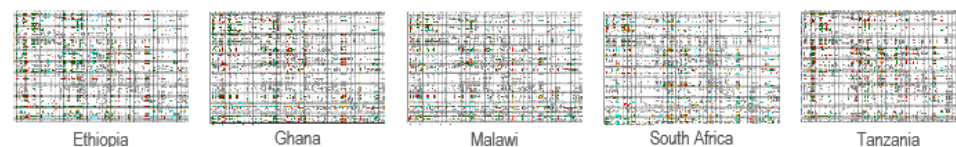
South Asia:



Southeast Asia:










Africa:



Source: Available from <https://sdginterlinkages.iges.jp/Dashboards%20and%20Data.html> (Zhou, et al., 2019).

Applications of IGES SDG Interlinkages Tool

-  UN ESCAP SDG Helpdesk Toolboxes
https://sdghelpdesk.unescap.org/toolboxes?field_sdgs_target_id=All&title=&page=2 .
-  United Nations Interagency Task Team on STI for the SDGs (IATT), STI Roadmaps related information <https://sustainabledevelopment.un.org/TFM>
-  A case study for Bangladesh on integrated priority setting and institutional arrangement supporting Bangladesh's PMO in SDG planning and implementation;
-  Capacity building workshop in Indonesia and supporting BAPPENAS in the development of the national SDG roadmap, October, 2018;
-  IGES SDG synergies and trade-offs analysis included in the 2019 VNR report of Ghana is presented as a basic template for exploring interlinkages between SDG targets in the UNDESA's VNR Guidebook 2020 Edition (p.25).
-  On-going projects: UNDESA's project on capacity building on integrated policy making in developing countries, KEI's project on environmental SDGs in Cambodia, SWITCH Asia project on SCP action plan development in Viet Nam, JST-TaSE project on SDG interlinkages at the river-basin level, etc.
-  Applications to thematic issues
 - NDC-SDG interlinkages
 - Aichi Biodiversity Targets and SDG interlinkages
 - SCP and SDGs
 - SDG core indicators

Summary of selected literature on SDG interlinkages

Literature	Scope	SDG coverage	Level of interlinkages analysis	Nature of interlinkages analysis
Zhou and Moinuddin (2017); Zhou et al. (2017, 2018, 2019)	National, 27 countries from Asia (22) and Africa(5)	All	Target level	Qualitative analysis, quantitative analysis, social network analysis, synergies and trade-offs dashboards, SDG Interlinkages Tool
European Commission, 2019*	General cumulative; Policy mapping focuses on EU 27 region	All	Goal level, Target level	Qualitative analysis, policy mapping, social network analysis
Miola, Borchardt and Neher, 2019**	Regional (EU 27 region) National (Austria case study)	All	Target level	Qualitative analysis, quantitative analysis, social network analysis
Allen, Metternicht and Wiedmann, 2019	Regional (22 countries in the Arab region)	All	Target level	Multicriteria analysis, social Network Analysis
Jaramillo <i>et al.</i> , 2019	Sectoral (wetlands)	Goal 2 Goal 6 Goal 12	Target level	Network analysis
OECD, 2018	General with focus on OECD region National (19 OECD country profiles)	Goal 6 Goal 7 Goal 11 Goal 12 Goal 15	Goal level Target level	Policy Coherence for Sustainable Development (PCSD) framework
Millennium Institute, 2019, 2018	General Customizable to any country	All	Goal level, Target level	Integrated simulation, quantitative analysis







Source: Moinuddin and Zhou (forthcoming) .

Summary of selected literature on SDG interlinkages (cont.)

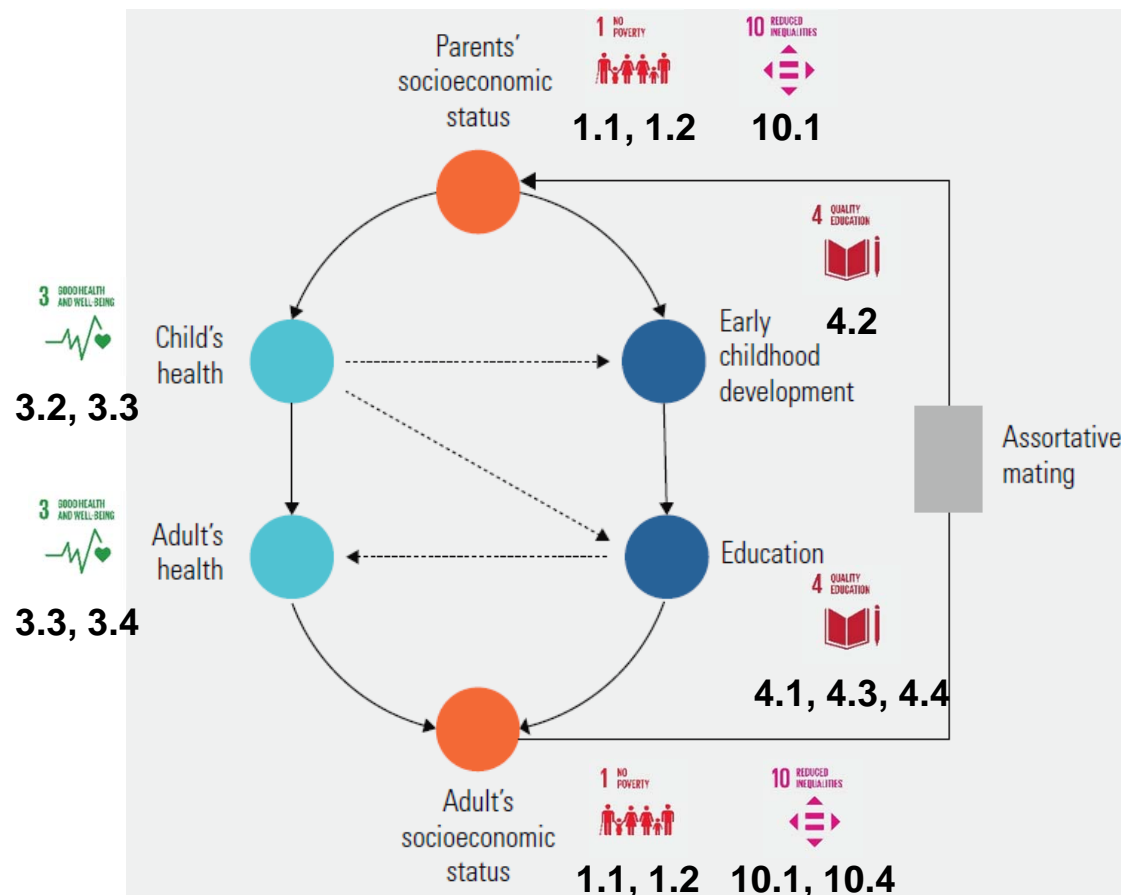
Literature	Scope	SDG coverage	Level of interlinkages analysis	Nature of interlinkages analysis
Weitz <i>et al.</i> , 2018	General Case study on Sweden	All	Target level	Systems analysis network analysis
ICSU, 2017	Global, National (country-specific illustrative examples)	Goal 2 Goal 3 Goal 7 Goal 14	Goal level, Target level	Qualitative analysis, quantitative analysis
UNESCAP, 2017	Sectoral National (pilot application in Fiji and Tajikistan; issue-based examples in Japan, Nepal and Singapore)	Goal 6	Target level	qualitative analysis
UNESCAP, no date	General sectoral	Selected goals (Goals 7, 11, 12, 15)	Target level	qualitative analysis
UNDP, 2017	General Global Several country-specific examples	All	Goal level, Target level	qualitative assessment
Nilsson, Griggs and Visback, 2016	General Conceptual	-	Target level	Analytical framework
Elder, Bengtsson and Akenji, 2016	General Conceptual	All	Goal level	Systemic and functional way to classify the SDGs
Niestroy, 2016	General Regional perspectives (EU, OECD)	All	Goal level	Conceptual framework for clustering the SDGs
Le Blanc, 2015	General	All	Goal level, Target level	Qualitative analysis, social network analysis

Source: Moinuddin and Zhou (forthcoming) .

IGES methodology on SDG interlinkages analysis

-  **Step I:** Identification of the binary linkages between SDG targets based on causalities through a comprehensive literature review;
-  **Step II:** Selection of the indicators with trackable data for selected countries based on the Global SDG Indicators Database (United Nations Statistics Division, 2019) and other sources (World Bank, 2019, etc.);
-  **Step III:** Correlation analysis using the indicator-level time-series data (1990-2019) collected for selected countries;
-  **Step IV:** Quantification of the identified causal relations between relevant SDG targets based on the correlation coefficients.
-  Apply a network analysis technique based on centralities for the identification of key targets in the network of SDG interlinkages.
-  Analysis of the synergies and trade-offs of the key targets based on quantified linkages.

Step I: Identification of the causal links between relevant SDG targets based on literature review



An example of lifelong disadvantage

- Children born to low-income families (Targets 1.1, 1.2 and 10.1) are more prone to poor health (Target 3.2, 3.3, etc.) and lower education (Targets 4.1, 4.2, 4.3);
- Those with lower education (Targets 4.1, 4.3, 4.4) are less likely to earn as much as others (Targets 1.1, 1.2, 10.1, 10.4);
- Children in poorer health (Targets 3.2, 3.3) are more likely to miss school (Targets 4.1, 4.2).
- And when children grow up, if they partner with someone who has similar socioeconomic status (as often happens in assortative mating), inequalities across generations can persist.

Source: Literature review on the causalities of persistent inequalities provided in the Human Development Report 2019 (UNDP, 2019)

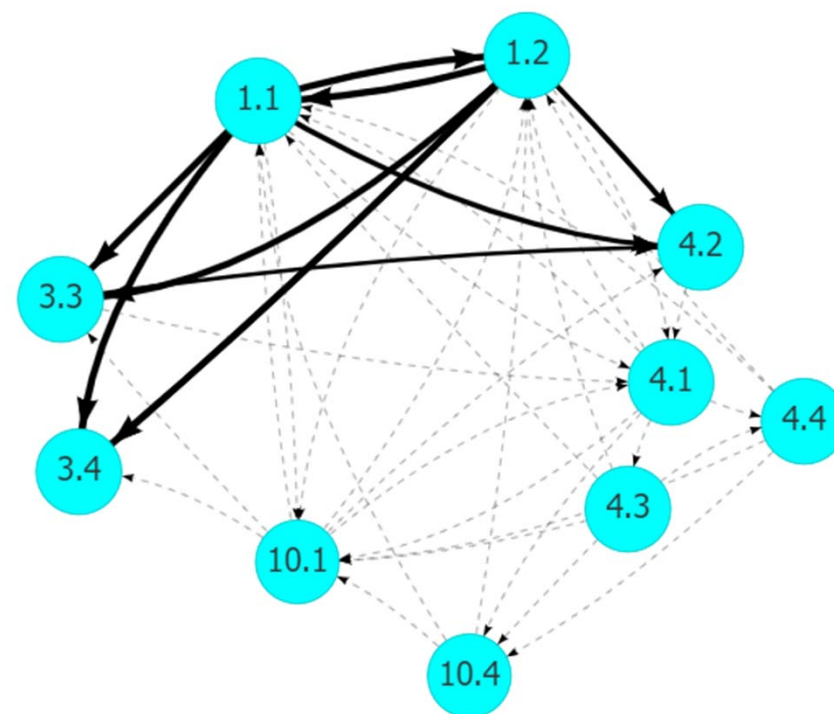
Identification of the binary linkages between 169 targets based on causalities

From target	To target	Context
1.1	3.4	Parents' incomes and circumstances (Targets 1.1, 1.2 and 10.1) affect their children's health (Target 3.2, 3.3, etc.), education (Targets 4.1, 4.2, 4.3) and incomes. Children born to low-income families are more prone to poor health and lower education. Those with lower education (Targets 4.1, 4.3, 4.4) are less likely to earn as much as others (Targets 1.1, 1.2, 10.1, 10.4), while children in poorer health (Targets 3.2, 3.3) are more likely to miss school (Targets 4.1, 4.2). And when children grow up, if they partner with someone who has similar socioeconomic status (as often happens in assortative mating), inequalities across generations can persist.
1.1	3.3	
1.1	4.1	
1.1	4.2	
1.1	4.3	
1.2	3.4	
1.2	3.3	
1.2	4.1	
1.2	4.2	
1.2	4.3	
10.1	3.4	
10.1	3.3	
10.1	4.1	
10.1	4.2	
10.1	4.3	
4.1	1.1	Better lower education lead to better higher education and better skill capacity.
4.1	1.2	
4.1	10.1	
4.1	10.4	
4.3	1.1	
4.3	1.2	
4.3	10.1	
4.3	10.4	
4.4	1.1	
4.4	1.2	
4.4	10.1	
4.4	10.4	
4.2	4.1	
4.1	4.3	
4.3	4.4	
3.4	4.1	Parents' incomes and circumstances (Targets 1.1, 1.2 and 10.1) affect their children's health (Target 3.2, 3.3, etc.), education (Targets 4.1, 4.2, 4.3) and incomes. Children born to low-income families are more prone to poor health and lower education. Those with lower education (Targets 4.1, 4.3, 4.4) are
3.4	4.2	
3.3	4.1	
3.3	4.2	

Source: Identification of the binary linkages based on the causalities of persistent inequalities through a literature review.

Binary linkage (directional)

- "1" indicating a causal link between a pair target;
- "0" indicating no causal link between a pair target;
- A total of 8,759 causal links were identified.

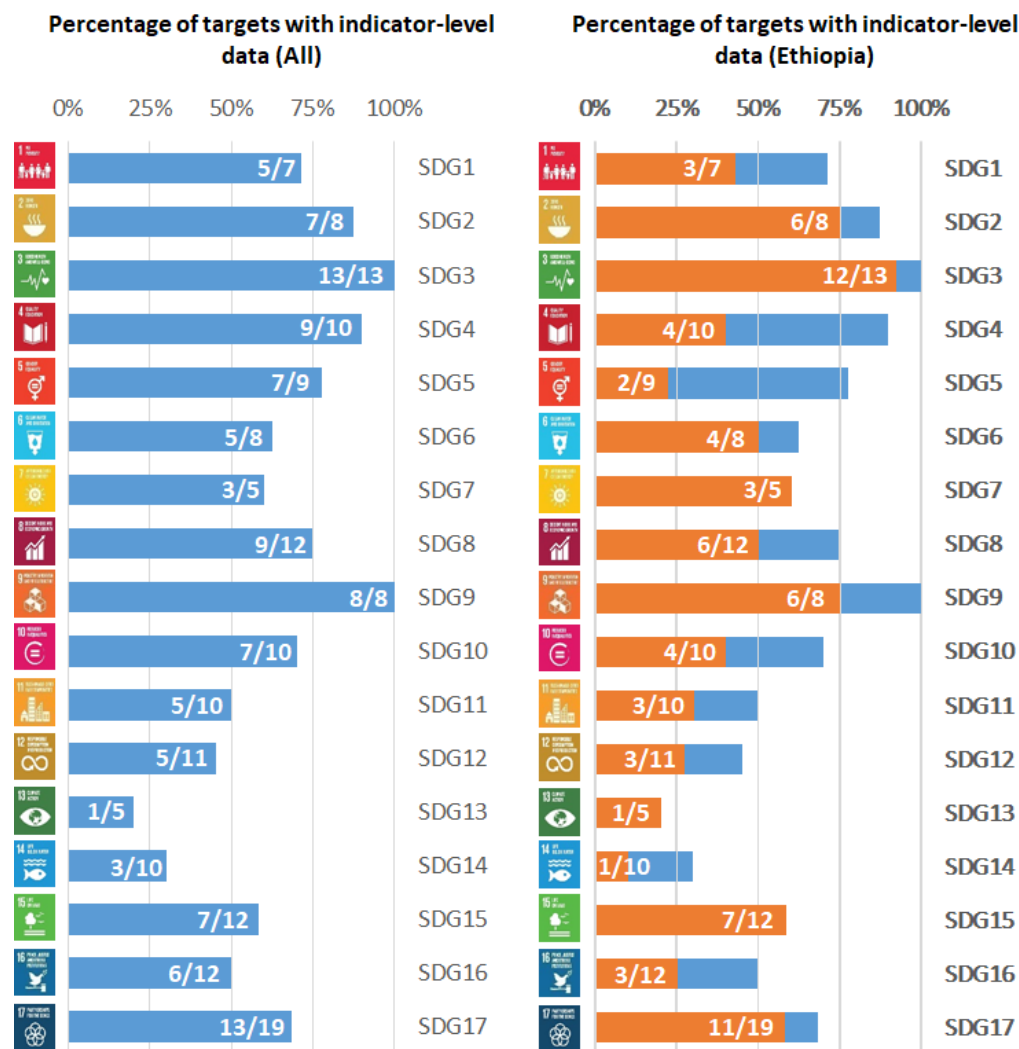


Source: A screenshot for Ethiopia using the SDG Interlinkages Analysis & Visualisation Tool (V3.0) (Zhou, et al., 2019)

Step II Identification of relevant indicators for SDG targets and data collection

Indicators and data availability

- Major indicators: 232 global SDG indicators and data from UNSD Global SDG Indicators Database
- Other proxy indicators: World Bank Indicators Database, etc.;
- 145 indicators with trackable data corresponding to 113 SDG targets were selected;
- Uneven data availability for Goals (20%-100%) and for countries;
- Time series data (1990 – 2018) for 145 indicators collected for 27 countries.



Source: Calculated by the author based on the SDG Interlinkages Tool

Step III Calculation of the Pearson correlation coefficients

- A full time series is generated for each indicator using linear regression to estimate the missing data;
- Pearson correlation coefficients are calculated [-1, 1] indicating the linear relationship between relevant pair targets;
- Positive coefficients (positive linear relations) vs. negative coefficients (negative linear relations);
- Strong linkages (larger absolute values) vs. weak linkages (smaller absolute values);

	Strong positive : Correlation value (0.7, 1]
	Weak positive: Correlation value (0, 0.7]
	Weak negative: Correlation value [-0.7, 0)
	Strong negative: Correlation value [-1, -0.7)
	Data not available for quantification.

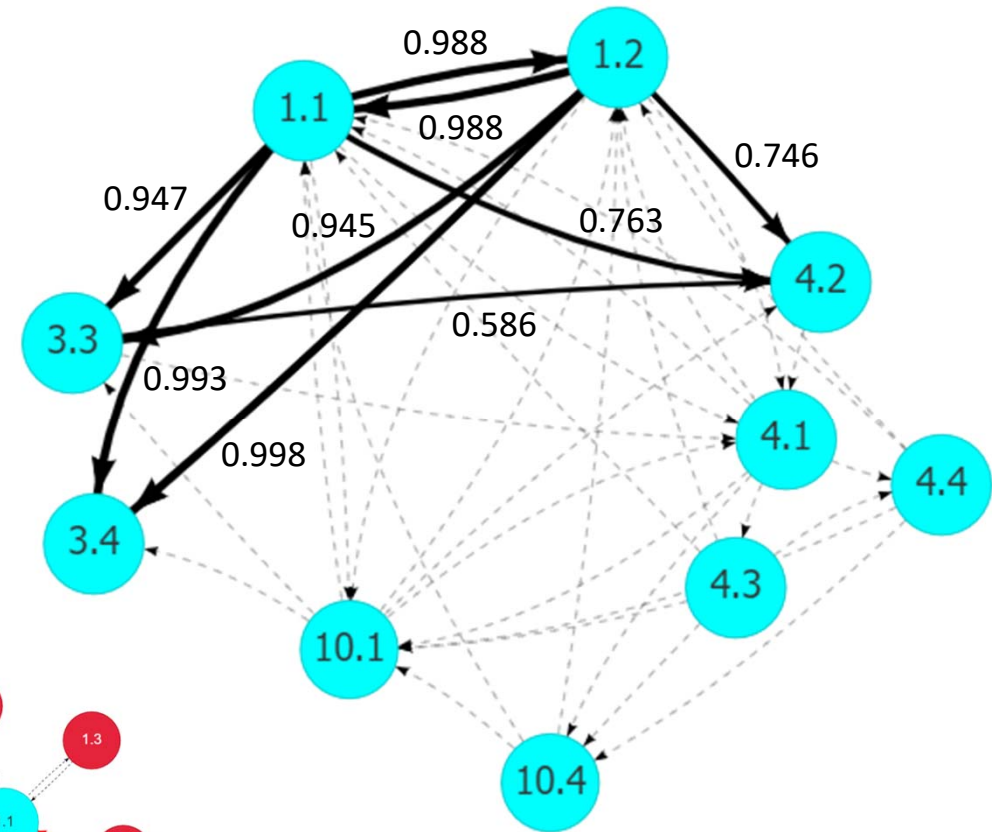
- Correlation matrix calculated for 27 countries.

	1.1	1.2	1.3	1.4	1.5	1.a	1.b	2.1	2.2	2.3	2.4	2.5	2.a	2.b	2.c
1.1		0.99	N/A	N/A	0.95			0.99	0.99	0.84	-0.93				
1.2	0.99			N/A	0.95			1.00	1.00	0.87	-0.94				
1.3	N/A	N/A		N/A	N/A			N/A	N/A	N/A	N/A				
1.4	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A			
1.5	0.95	0.95	N/A					0.95	0.95	0.74	-0.87		0.28		
1.a	0.98	0.98	N/A	N/A			N/A	0.98	0.98	0.84	-0.93		0.37	N/A	
1.b	N/A	N/A	N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2.1	0.99	1.00		N/A					1.00						
2.2	0.99	1.00						1.00							
2.3	0.84	0.87	N/A	N/A	0.74	0.84	N/A	0.86	0.86		-0.87	-0.90	0.20		
2.4	-0.93	-0.94	N/A		-0.87			-0.93		-0.87			-0.27		
2.5	-0.84	-0.87								-0.90	0.88		-0.11		
2.a	0.25	0.28					N/A			0.20	-0.27	-0.11			
2.b	N/A	N/A		N/A		N/A	N/A	N/A		N/A	N/A				
2.c	-0.99	-1.00		N/A				-1.00		-0.86	0.94				
3.1	0.99	1.00	N/A												
3.2			N/A					1.00	1.00						
3.3	0.95	0.95	N/A							0.78					
3.4	0.99	1.00	N/A												
3.5	-0.95	-0.96													
3.6	-0.93	-0.93	N/A							-0.82	0.91				
3.7	0.98	0.99	N/A					0.99	0.99						

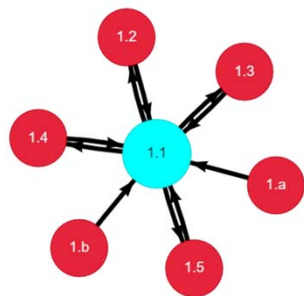
Source: A snapshot of the correlation coefficient matrix for Ethiopia (Zhou, et al., 2019)

Step IV Quantification of the causal links identified under Step I

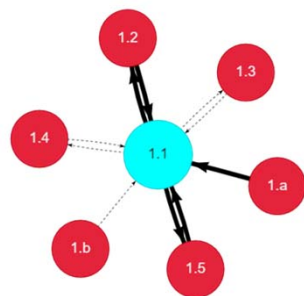
- Quantification of the causal links (identified as “1” under Step I) based on the correlation coefficients;
- A pair target do not have a link if their binary linkage identified under Step I is “0” even though their correlation coefficient is not zero;
- Country-specific quantified interlinkages though the binary linkages (causal links) are identical for countries.



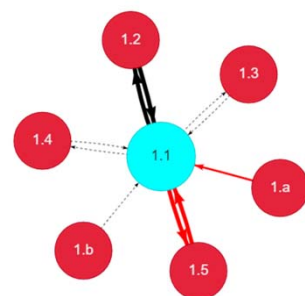
Quantified linkages for Ethiopia based on the causalities of persistent inequalities



Binary linkages of Target 1.1



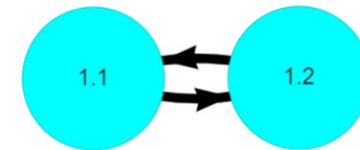
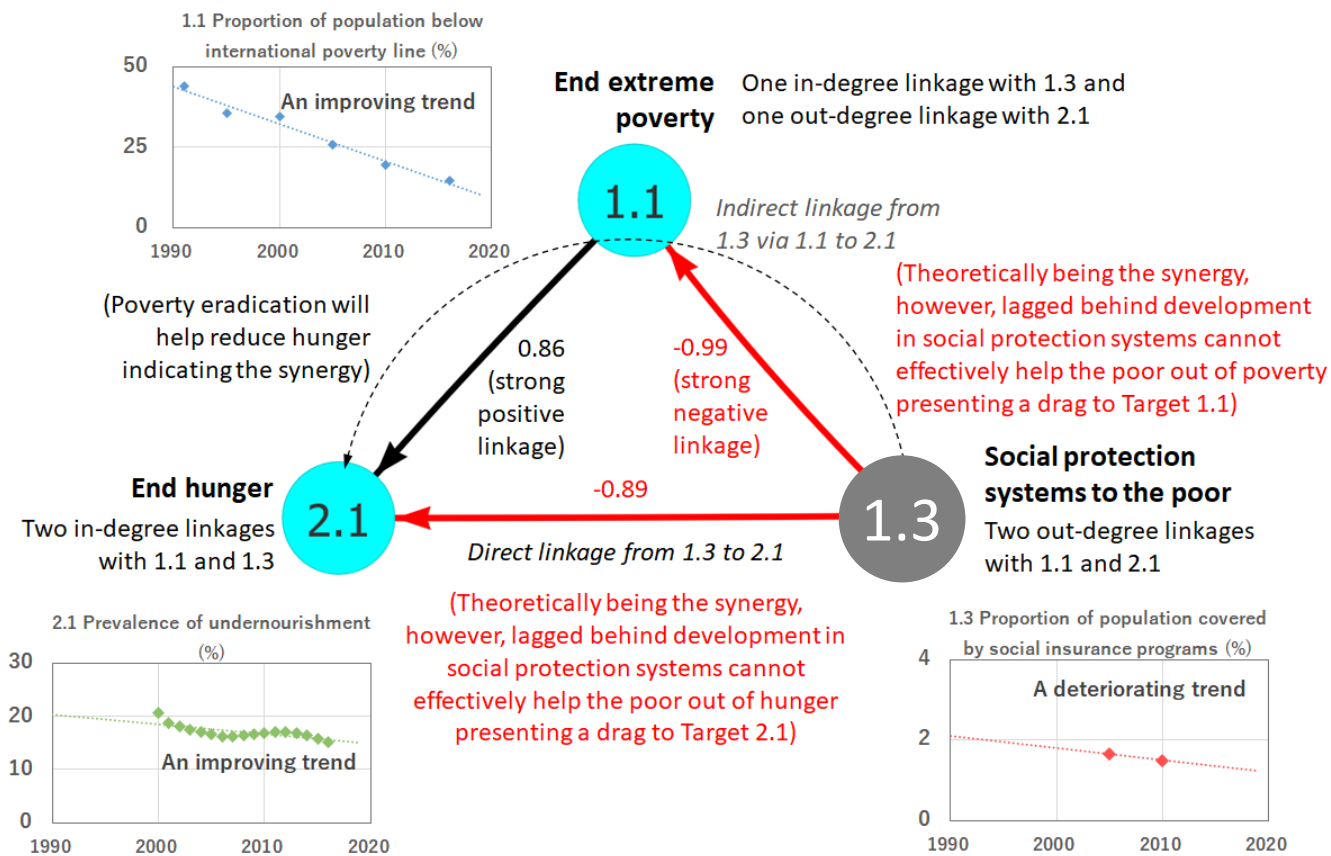
Quantified linkages of Target 1.1 (Ethiopia)



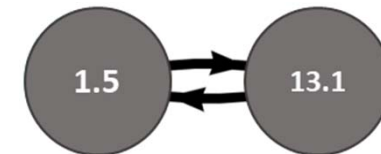
Quantified Linkages of Target 1.1 (Lao PDR)

Source: Create using SDG Interlinkages Analysis & Visualisation Tool (V3.0) (Zhou, et al., 2019)

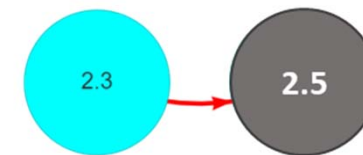
Understanding the scope and strength of the interlinkages



A virtuous cycle between targets for Ethiopia (positive synergies)



A vicious cycle between targets for Ethiopia (negative synergies)



A trade-off between targets for Ethiopia

Source: A case of Bangladesh (Zhou and Mustafa, forthcoming)

Identification of key SDG targets using a social network analysis technique

Centrality	Definition	Implications for SDG interlinkages
Degree centrality	In a directional network, it measures total number of ties connected to a node, including both the ties from the node to others and the ties from others to the node.	In the network of SDG interlinkages, central targets are active in a sense that they have the most ties with other targets.
Out-degree centrality	In a directional network, out-degree centrality of a node measures number of ties from the node to others.	It measures the role of a target which exerts influences on others in the network of interlinkages. A target plays a central role if it influences widely on other targets.
Weighted degree centrality	In contrast to degree centrality for which the weight of each tie equals to 1, weighted degree centrality measures the weighted ties of the node. The weight of each tie, ranging [0, 1], indicates the capacity of the tie.	It measures not only how active a target connects with other targets but also the strength of the connections. A target is central if it connects with others both widely and strongly.
Weighted out-degree centrality	In contrast to out-degree centrality, weighted out-degree centrality measures the weighted ties from the node to others.	It measures not only how wide a target exerts influence on others but also the strength of the influences. A target is central if it influences widely and strongly on others.
Closeness centrality	Closeness centrality measures the mean distance from a node to other nodes.	It measures how close a target to other targets in the network of interlinkages. A target plays a central role if it can quickly interact with or influence on all others.
Betweenness centrality	Betweenness centrality measures the extent to which a node lies on the paths between nonadjacent nodes.	It measures the intermediate roles playing by a node in connecting nonadjacent nodes. A target is central if it has the ability of control over or enabling the interactions of other targets in the network of SDG interlinkages.
Eigenvector centrality	Eigenvector centrality takes into account not only how many ties a node has but also whether the node has important ties, such as with the central points in a network.	In the network of SDG interlinkages, a target with high eigenvector centrality indicates that the target both has wide connections with others and places at a strategic position connecting with the most influential targets.

Source: Zhou and Mustafa (2017) (Available at https://sdginterlinkages.iges.jp/files/IGES_Research%20Report_SDG%20Interlinkages_Printing%20Version.pdf)

An application to Ethiopia for the identification of key targets by ranking the centralities

Rank	Target	Degree	Outdegree	Weighted degree	Weighted outdegree	Closness	Betweenness	Eigenvector	Averag rank
1	9.a	94	50	78.79	42.65	0.73	216.16	0.65	5.14
2	13.1	90	44	75.37	37.94	0.68	113.86	0.77	5.86
3	12.2	88	39	78.34	35.57	0.66	92.42	0.83	7.14
4	8.1	92	43	67.74	26.90	0.69	301.45	0.79	8.43
5	2.3	95	36	76.19	29.65	0.64	119.16	0.96	9.57
6	8.4	85	39	75.02	34.84	0.65	76.05	0.78	10.00
7	11.2	88	46	55.75	29.94	0.70	101.05	0.69	11.29
8	11.1	73	39	66.33	35.76	0.66	84.96	0.59	12.57
9	15.2	75	34	66.76	31.30	0.64	68.32	0.67	15.14
10	15.5	75	34	63.86	30.02	0.64	65.01	0.67	17.43
11	15.1	73	33	65.22	31.16	0.63	55.99	0.67	18.43
12	17.9	109	79	72.23	52.53	1.00	324.63	0.33	8.29
13	16.6	81	65	66.02	54.10	0.85	108.00	0.23	12.71
14	5.5	60	40	53.79	36.38	0.67	99.68	0.31	16.00
15	1.5	70	35	57.66	29.80	0.63	46.11	0.62	20.00
16	15.3	68	34	58.44	30.46	0.64	35.84	0.60	21.00
17	7.2	66	33	57.05	28.40	0.62	57.37	0.61	22.43
18	11.5	68	34	56.13	28.85	0.63	35.54	0.60	24.00
19	8.5	74	27	66.96	25.21	0.59	149.05	0.81	19.14
20	1.2	85	26	77.49	24.53	0.58	120.64	1.00	19.29
21	7.1	67	32	58.61	28.54	0.62	50.65	0.68	21.86
22	8.2	80	33	37.57	15.23	0.63	114.40	0.76	26.71
23	10.b	59	40	49.62	33.99	0.67	76.45	0.21	19.86
24	17.17	62	50	44.53	36.85	0.73	47.69	0.18	22.14
25	1.1	84	25	76.22	23.68	0.57	112.17	1.00	22.29
26	2.4	80	27	68.45	23.70	0.59	51.29	0.89	22.86
27	16.8	52	36	45.92	30.81	0.65	63.77	0.23	24.14
28	17.13	57	39	43.32	30.80	0.66	60.39	0.20	24.29
29	6.1	70	28	63.89	26.52	0.59	43.01	0.81	24.43
30	9.2	66	30	52.67	24.42	0.60	67.33	0.56	26.00

Source: Calculated based on the data of the quantified SDG interlinkages for Ethiopia provided by the SDG Interlinkages Tool (Zhou, et al., 2019) by using Cytoscape, a software for network analysis and visualisation.

Integration of SDGs in the Ethiopia's national development plan

- Growth and Transformation Plan II (2015/16-2019/20), GTP II, focuses on creating good conditions for macroeconomic stability, promoting fast economic growth, infrastructure development and human resources and technology enhancement, and building good governance;
- The priority areas of the GTP II have been well integrated with the SDGs with the policy matrix linking SDGs with relevant policy objectives of the priority areas and SDG indicators or national proxy indicators to monitoring the progress in achieving SDGs.



Source: Compiled by the authors based on the Policy Matrix (National Planning Commission, 2016a) and the Main Text (National Planning Commission, 2016b) of GTP II.

Comparison of 30 key targets with the national priority strategies of GTP II

GTP II policy priorities	Common priority targets (25)	Priority targets identified in GTP II (67)	Priority targets identified through network analysis (5)
Macroeconomic plan	1.1, 1.2, 1.5, 2.3, 8.1, 8.5, 9.2, 17.13	1.3, 8.3, 8.6, 9.3, 10.1, 10.4 , 17.1 (68), 17.2 , 17.3 (66), 17.5 , 17.11 (57)	10.b
Agriculture development and rural transformation	1.1, 1.2, 1.5, 2.3, 2.4, 8.1, 8.2, 12.2, 13.1, 15.1, 15.2, 15.3, 15.5	1.3, 1.4 , 2.1 (48), 2.2 (46), 2.5 (60), 2.a (39), 6.5 , 6.6 (45), 10.2, 13.2, 15.6, 15.8, 15.9, 17.5 , 17.11 (57)	10.b, 17.17
Industrial development	1.1, 8.1, 8.2, 8.5, 9.2	6.3, 9.1 , 9.4 (38), 9.5 (50), 12.4, 12.5, 12.6, 17.5 , 17.11 (57)	9.a, 17.17
Economic infrastructure development	1.1, 2.4, 6.1, 7.1, 7.2, 8.1, 8.2, 8.4, 8.5, 11.1, 11.2, 11.5, 12.2, 13.1, 15.5	2.1 (48), 2.a (39), 3.6 (74), 3.9 (49), 5.1 , 6.2 (40), 6.3, 6.4, 6.5 , 6.6 (45), 7.3 (44), 8.3, 8.9, 9.1, 9.3, 11.3, 11.4, 11.6, 12.5, 13.2, 15.7, 16.10 , 17.3 (66), 17.8 (41), 17.11 (57)	9.a, 10.b, 17.17
Human development and technology capacity building	8.2	2.2 (46), 3.1 (73), 3.2 (69), 3.4 (47), 3.5 (76), 3.8 , 3.9 (49), 4.1, 4.3, 5.1 , 17.6 (53)	10.b
Good governance	5.5, 16.6	3.6 (74), 5.1, 5.2, 5.3, 10.2 , 16.1 (77), 16.3, 16.5	16.8, 17.9, 17.17
Cross-cutting issues	5.5, 8.5, 15.2	1.4 , 3.2 (69), 3.9 (49), 4.2 (78), 4.4, 4.5 (36), 4.6, 5.1, 5.3, 8.3, 8.6, 8.7, 8.8, 8.10 (75), 10.2, 10.4, 10.7, 11.6, 12.8, 13.3, 16.2, 16.7, 16.9 , 17.3 (66)	

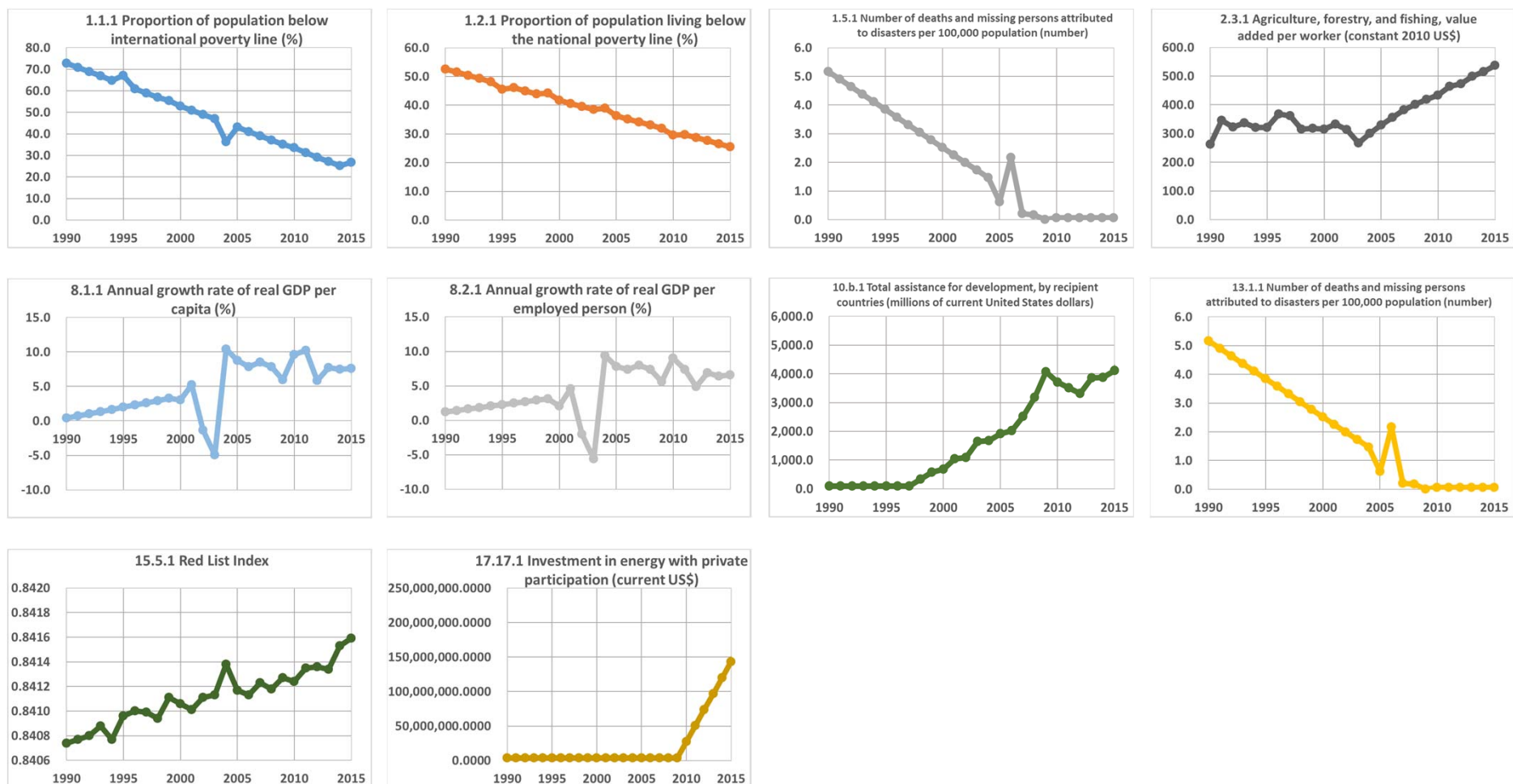
Note: 45 targets in red indicate that there is no trackable data for the relevant indicators. Numbers in bracket for Column 3 indicate the ranking results of respective targets.

Schemes for the analysis and visualisation of the synergies and trade-offs of key targets

Key targets	Outdegree linkages (impacts generated on others)			Indegree linkages (impacts received from others)		
	Positive synergies	Negative synergies	Trade-offs	Positive synergies	Negative synergies	Development drags
On track	✓	-	✓		-	✓
Off track	-	✓		-	✓	

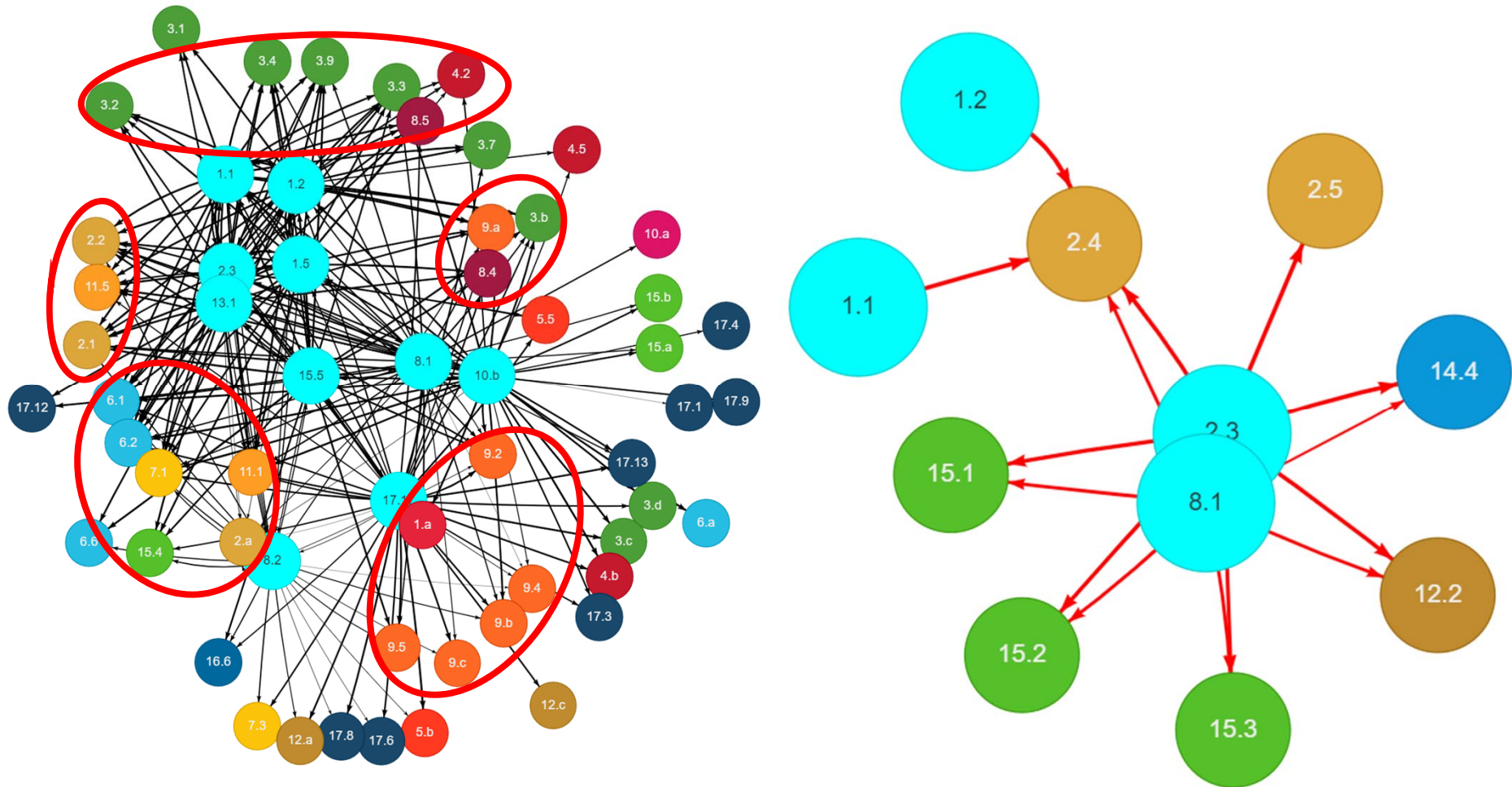
GTP II policy priorities	Relevant key targets on track	Relevant key targets off track
Macroeconomic plan	1.1, 1.2, 1.5, 2.3, 8.1, 8.5, 9.2, 10.b, 17.13	
Agriculture development and rural transformation	1.1, 1.2, 1.5, 2.3, 8.1, 8.2, 10.b, 13.1, 15.5, 17.17	2.4, 12.2, 15.1, 15.2, 15.3
Industrial development	1.1, 8.1, 8.2, 8.5, 9.2, 9.a, 17.17	
Economic infrastructure development	1.1, 6.1, 7.1, 7.2, 8.1, 8.2, 8.4, 8.5, 9.a, 10.b, 11.1, 11.5, 13.1, 15.5, 17.17	2.4, 11.2, 12.2
Human development and technology capacity building	8.2, 10.b	
Good governance	5.5, 16.6, 17.9, 17.17	16.8
Cross-cutting issues	5.5, 8.5	15.2

Historical trend of key targets (on track) aiming for achieving agriculture and rural development under GTP II



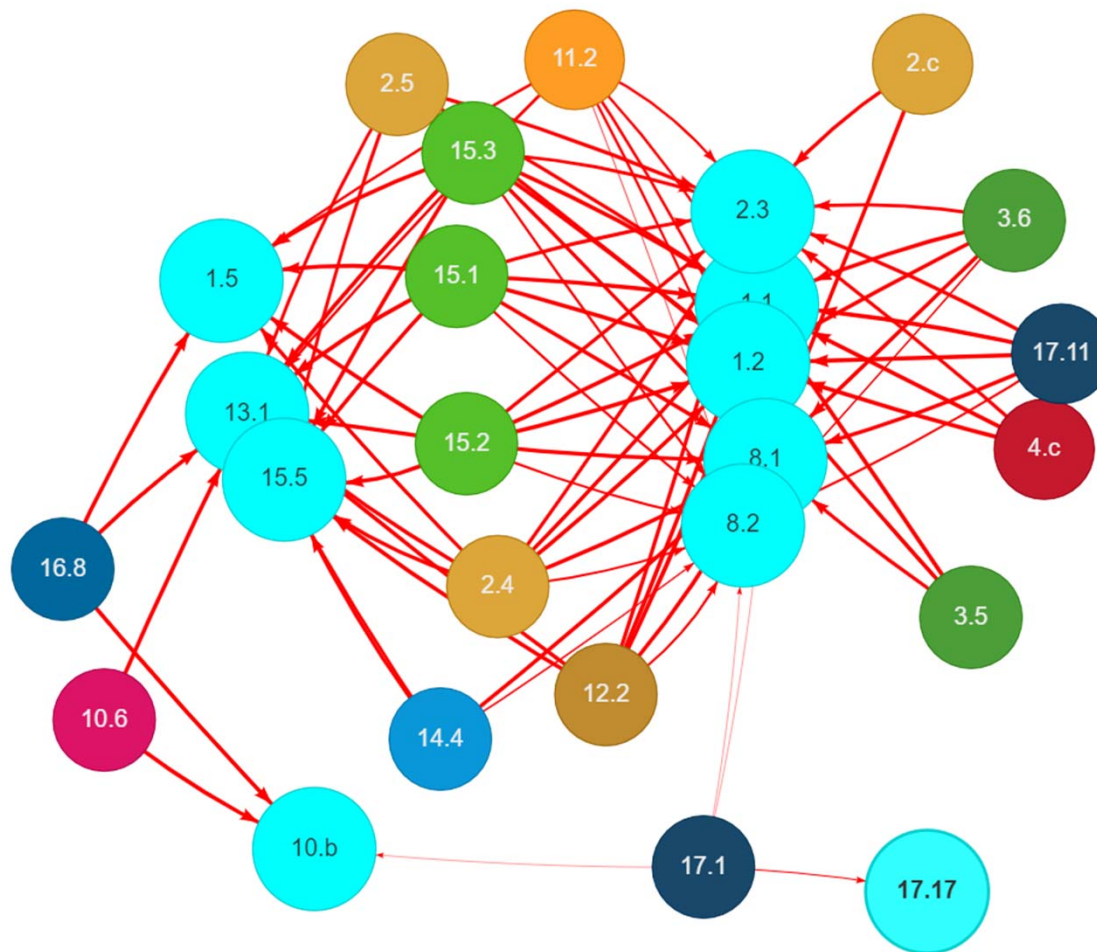
Source: Data used by the SDG Interlinkages Analysis & Visualisation Tool (V3.0) (Zhou et al., 2019)

Positive synergies and trade-offs through the outdegree linkages of key targets (on track) aiming for achieving agriculture and rural development under GTPII



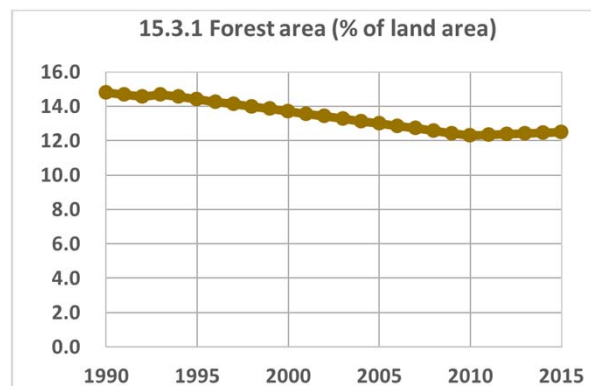
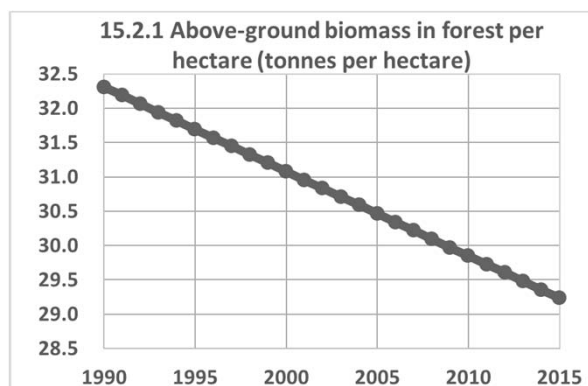
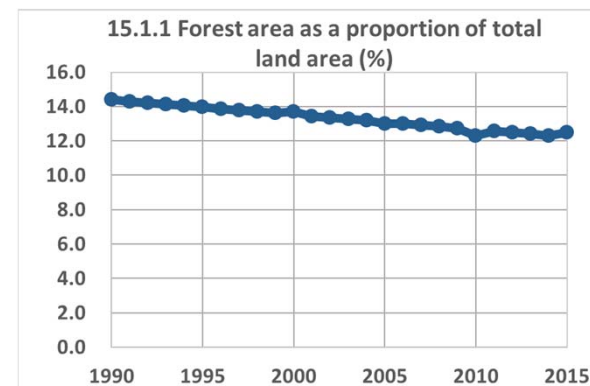
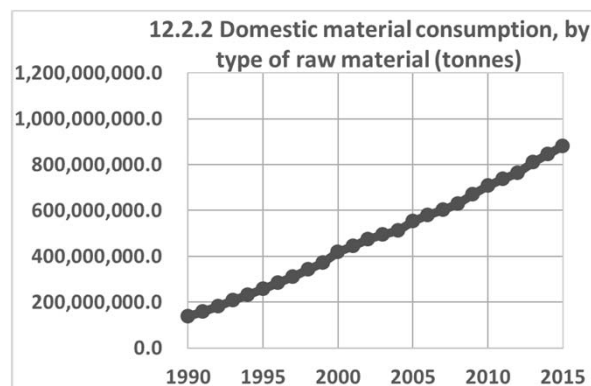
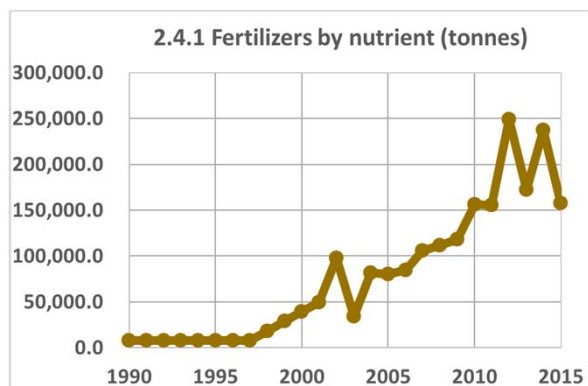
Source: SDG Interlinkages Analysis & Visualisation Tool (V3.0) (Zhou et al., 2019)

Development drags through the indegree linkages of key targets (on track) aiming for achieving agriculture and rural development under GTPII



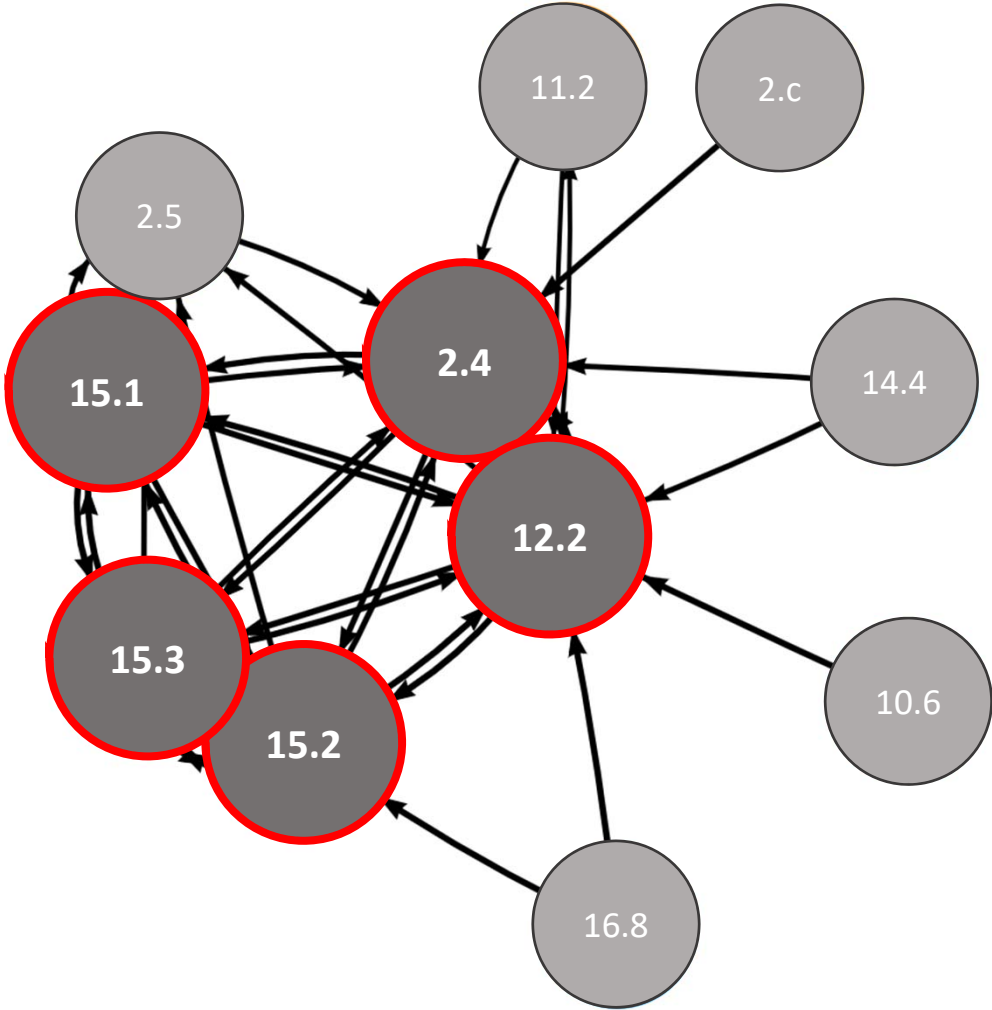
Source: SDG Interlinkages Analysis & Visualisation Tool (V3.0) (Zhou et al., 2019)

Historical trend of key targets (off track) related to achieving agriculture and rural development under GTP II



Source: Data used by the SDG Interlinkages Analysis & Visualisation Tool (V3.0) (Zhou et al., 2019)

Negative synergies through the outdegree and indegree linkages of key targets (off track) aiming for achieving agriculture and rural development under GTPII



Source: SDG Interlinkages Analysis & Visualisation Tool (V3.0) (Zhou et al., 2019)

Summary of the synergies and trade-offs of 30 key targets for achieving GTP II

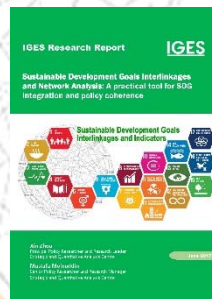
Major development areas of GTP II	Targets on track and implications			Targets on track and implications	
	Key targets	Major positive synergies	Major trade-offs	Key targets	Negative synergies
Macroeconomic plan	1.1, 1.2, 1.5, 2.3, 8.1, 8.5, 9.2, 10.b, 17.13	1.a, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 3.9, 3.b, 4.5, 5.5, 6.1, 6.2, 7.1, 8.2, 8.a, 9.a, 11.1, 11.5, 13.1	2.4, 2.5, 12.2, 14.4, 15.1, 15.2, 15.3	-	-
Agriculture development and rural transformation	1.1, 1.2, 1.5, 2.3, 8.1, 8.2, 10.b, 13.1, 15.5, 17.17	1.a, 2.1, 2.2, 2.a, 3.2, 3.3, 3.4, 3.9, 3.b, 4.2, 6.1, 6.2, 7.1, 8.4, 8.5, 9.2, 9.4, 9.5, 9.a, 9.b, 9.c, 11.1, 11.5, 15.4	2.4, 2.5, 12.2, 14.4, 15.1, 15.2, 15.3	2.4, 12.2, 15.1, 15.2, 15.3	2.5, 2.c, 11.2, 10.6, 14.4, 16.8
Industrial development	1.1, 8.1, 8.2, 8.5, 9.2, 9.a, 17.17	1.2, 1.5, 2.2, 2.3, 3.b, 6.1, 7.1, 9.5, 9.b, 9.c, 11.1, 13.1, 17.6	2.4, 2.5, 12.2, 14.4, 15.1, 15.2, 15.3	-	-
Economic infrastructure development	1.1, 6.1, 7.1, 7.2, 8.1, 8.2, 8.4, 8.5, 9.a, 10.b, 11.1, 11.5, 13.1, 15.5, 17.17	1.2, 1.5, 2.1, 2.2, 2.3, 2.a, 3.2, 3.3, 3.4, 3.7, 3.9, 3.b, 3.c, 5.b, 6.2, 6.6, 7.3, 8.a, 9.2, 9.4, 9.5, 9.b, 9.c, 10.a, 12.a, 12.c, 15.4, 17.13, 17.19	2.4, 2.5, 12.2, 14.4, 15.1, 15.2, 15.3	2.4, 11.2, 12.2	2.5, 2.c, 3.6, 10.6, 14.4, 15.1, 15.2, 15.3, 16.8, 17.11
Good governance	5.5, 16.6, 17.9, 17.17	1.1, 1.2, 2.1, 2.2, 2.a, 3.2, 3.7, 3.9, 3.b, 3.c, 3.d, 4.2, 4.5, 4.b, 6.1, 6.a, 7.1, 7.2, 7.3, 8.1, 8.2, 8.5, 9.5, 9.a, 11.1, 13.1, 15.5, 16.1, 17.8	-	16.8	2.5, 3.5, 10.6, 12.2, 15.2, 17.11

Caveats and future research agenda

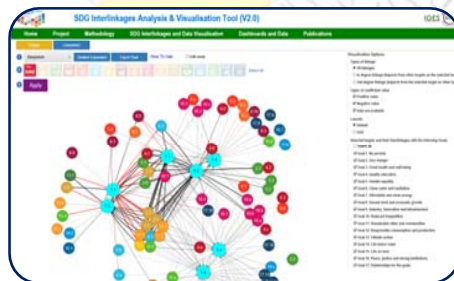
- 🌐 Identification of the binary linkages based on causalities based on limited literature review: *Systematic literature review using text mining techniques and validation through stakeholder consultations;*
- 🌐 Generic interlinkages vs. country-specific interlinkages;
- 🌐 Multidimensional characteristics of SDG targets and multi-faceted and context-based causal links;
- 🌐 Macro- vs. micro and other levels of analysis;
- 🌐 Gaps in indicators: mismatching with the targets, context-based measurement, disaggregation, data availability;
- 🌐 Diagnostic function vs. policy assessment and future projection;
- 🌐 Interlinkages analysis of sustainable development beyond SDG targets;
- 🌐 Applications in combination with other analytical tools.

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>.