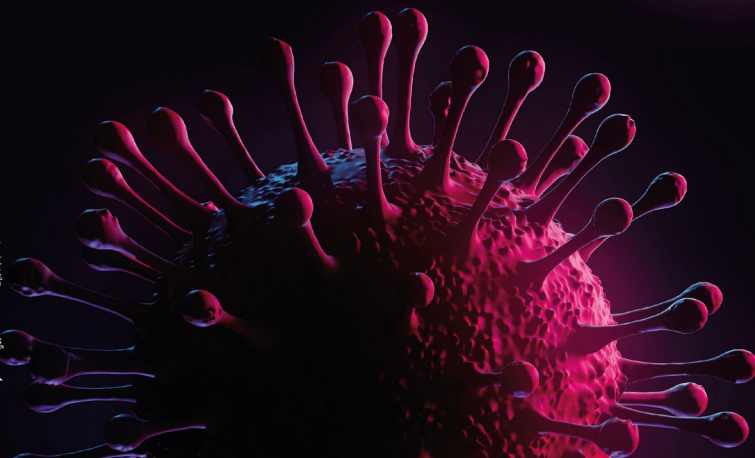
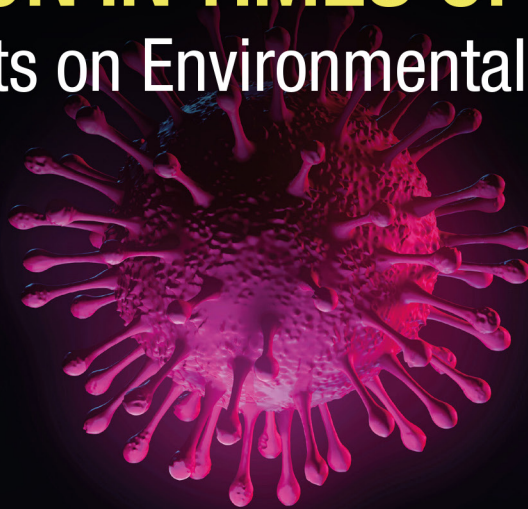
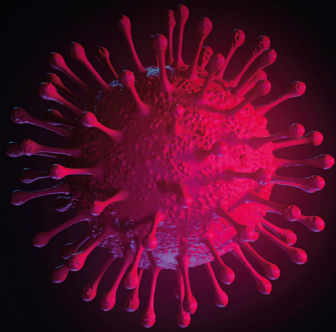




ENVIRONMENTAL RESILIENCE AND TRANSFORMATION IN TIMES OF COVID-19

Climate Change Effects on Environmental Functionality



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24

Impacts and implications of the COVID-19 crisis and its recovery for achieving Sustainable Development Goals in Asia

A review from an SDG interlinkage perspective

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24.1 Introduction

The Sustainable Development Goals (SDGs) are the global milestones set by the world leaders collectively in 2015 aiming for laying a solid foundation by 2030 for achieving long-term sustainable development. However, a couple of reviews on the SDG progress in Asia have indicated that many countries will not achieve the 2030 targets for most of the SDGs¹ (ESCAP, 2020). The United Nations, through the Decade of Action, has called for efforts to accelerate the delivery of SDGs. This, however, has been interrupted by the ongoing COVID-19 pandemic. The pandemic, which has evolved into a global crisis impacting people's lives and disrupting the operation of businesses and the functions of the society, will affect the trajectories of SDGs by widening the existing gaps in achieving the 2030 targets (United Nations, 2020g). These include not only the SDGs hit directly by the pandemic, such as Goal 1 (poverty eradication), Goal 3 (health and well-being), Goal 4 (universal access to quality education), Goals 8 (economic growth and decent works), Goal 9 (resilient infrastructure and sustainable industrialization), and international trade (Goal 17), but also their derived impacts, such as the life-long impacts on income and development of those who will be dropped out of school permanently due to forced school closure during the lockdown. Curbing the strong downward momentum and pushing back to the original or even a better track is critical to maintaining decades of development progress.

In response to the COVID-19 crisis, many countries have taken various measures to help businesses, activities and individuals to go back to normal. These include immediate responsive measures to restrain the pandemic, support the livelihoods of vulnerable people and survive businesses, particularly small and medium-sized enterprises (SMEs). Many countries are also considering medium to long-term recovery plans aiming at boosting economic growth, addressing the economic and social impacts or building long-term resilience and sustainability from a preventive perspective. The COVID-19 measures will have near to long-term impacts, either positive or negative, on achieving the SDGs through the interactions among the SDGs.

¹ The report looks at the progress of the SDGs in the Asia-Pacific region with historical data ranging from 2000 to 2019 and compares it with the 2030 target. The report found that given the current trend, the Asia-Pacific region as a whole is unlikely to achieve any of the 17 SDGs.

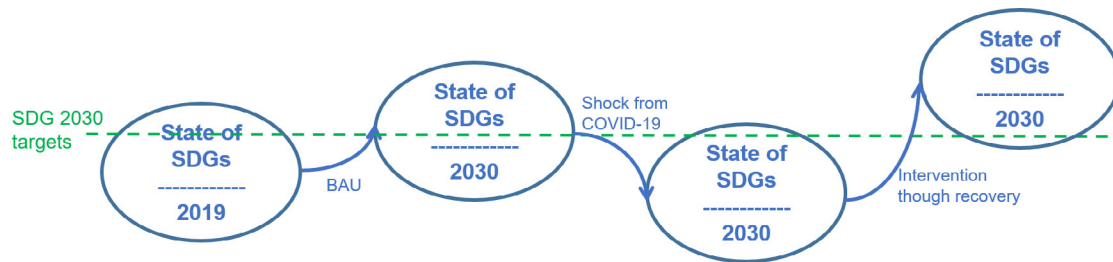


FIG. 24.1 Trajectories of achieving the SDGs in the pre-and-post-COVID-19 eras.

Understanding the impacts of COVID-19 and its recovery on achieving the SDGs from an interlinkage perspective is important to help grasp a wider picture of the impacts, as well as informing about the synergies and trade-offs. Understanding the synergies and trade-offs will help identify the areas where SDG acceleration through synergistic effects can be facilitated and where structural change, policy instruments or technological breakthrough are needed to manage the trade-offs. Such knowledge is helpful in an integrated planning for COVID-19 measures.

Soon after the emergence of the pandemic, various United Nations agencies and other international institutions started analyzing the potential impact of COVID-19, including its implications for the SDGs (DESA, 2020d, 2020c; WHO and UNICEF, 2020b; DESA, 2020a, 2020b; Hernando and San Andres, 2020; Mori *et al.*, 2020; UNDP, 2020; UNESCO, 2020; United Nations, 2020h; WHO and UNICEF, 2020a). However, many of these review studies discussed in a general way as opposed to linking with specific goals and targets. In this study, a comprehensive SDG interlinkage analysis was proposed for assessing the impacts of COVID-19 and its recovery on SDGs. An empirical analysis for Bangladesh and the Republic of Korea was conducted with the purpose that similar analyses can be replicable in other countries.

The COVID-19 crisis is a tragedy to all, but its recovery may provide an unprecedented opportunity to transform into a better world with resilience and sustainability. Fig. 24.1 provides a diagram explaining this analytical perspective. The business-as-usual (BAU) trajectory of SDGs towards 2030 based on the pre-COVID-19 situations will be affected by the COVID-19 shock, worsening the existing gaps. The interventions through the recovery measures are expected to place SDGs onto a trajectory that is more sustainable than the BAU trajectory. This study by reviewing the impacts of COVID-19 and its recovery on SDGs aims to contribute to seizing such an opportunity in Asia.

24.2 Methodology of the SDG interlinkage analysis

While the SDGs are broadly framed with 17 goals, the goals and their targets inherently connect with each other forming an indivisible and complex system. Achieving the SDGs will lay the foundation for building long-term resilience and sustainability. On the one hand, achieving one goal or target may contribute to achieving other goals or targets. For example, achieving Goal 4 on universal access to quality education at all levels will increase the ability and opportunity for employment (Target 8.5). On the other hand, the pursuit of one goal or target may conflict with achieving others. For example, increasing agricultural productivity (Target 2.3) can intensify water competition and affect the poor disproportionately in access to safe drinking water and sanitation (Targets 6.1 and 6.2). Understanding the interlinkages among the SDGs can help identify potential synergies and trade-offs. Maximizing the synergies and removing the trade-offs is a key to ensuring SDG integration and policy coherence. Leveraging SDG acceleration through addressing the synergies and trade-offs is an effective and strategic option for building back better.

In this study, a methodology for analyzing the impacts from COVID-19 and its recovery on SDGs is proposed from an interlinkage perspective. Through literature review and using the SDG Interlinkages Tool, an SDG interlinkage analysis of the impacts of COVID-19 and its recovery was provided for two Asian countries, Bangladesh and the Republic of Korea (see Fig. 24.2).

For the analysis of the impacts of COVID-19 on SDGs, a comprehensive literature review on COVID-19 impact was conducted based on the publications mainly from the United Nations organizations and other international agencies. The review results were synthesized and mapped with relevant SDG targets. Using the SDG Interlinkages Tool, the derived impacts from the mapped target areas were analyzed to provide a wider picture of the impacts from COVID-19 on SDGs.

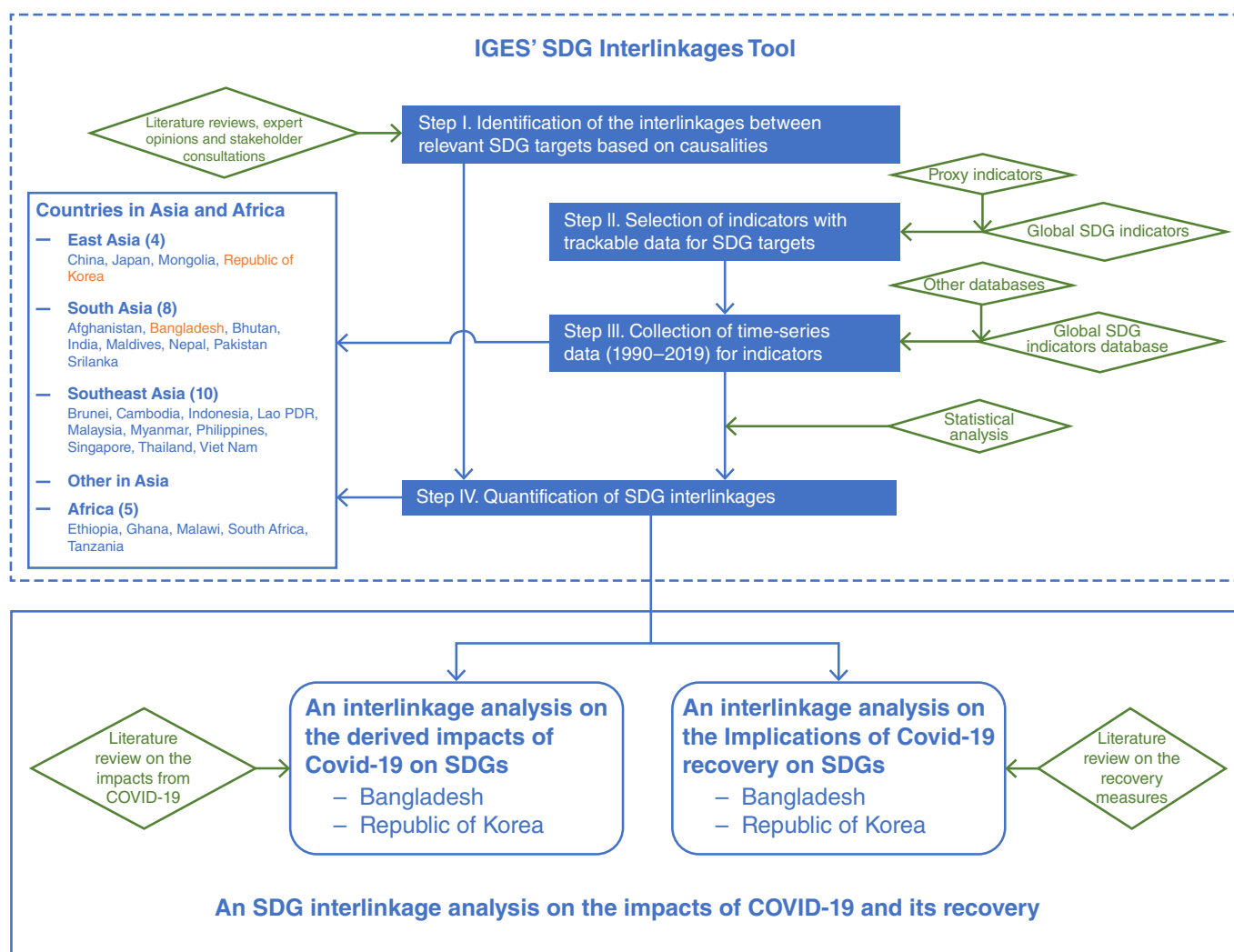


FIG. 24.2 Application of the SDG Interlinkages Tool for an SDG interlinkage analysis of the impacts of COVID-19 and its recovery. *Source: Zhou et al., 2019.*

In a parallel process, the impacts of COVID-19 measures on SDGs were conducted based on a literature review and using the SDG Interlinkages Tool. The proposed COVID-19 measures in Bangladesh and the Republic of Korea were identified based on a literature review and mapped with relevant SDG targets. Using the SDG interlinkages Tool, the impacts on SDGs from the stimulus to the mapped target areas were analyzed.

The SDG Interlinkages Tool was developed by the Institute for Global Environmental Strategies (IGES) based a methodology with four steps (see Fig. 24.2) to identify, quantify and visualize the interlinkages between targets (Zhou and Moinuddin, 2017; Zhou et al., 2019).

- **Step I:** Identification of the interlinkages between relevant SDG targets based on causalities through comprehensive literature review, expert consultations and stakeholder consultations;
- **Step II:** Selection of indicators with trackable data for corresponding SDG targets based on the Global SDG Indicators (UNSD, 2019) and other proxy indicators, such as the World Bank's World Development Indicators (World Bank, 2019);
- **Step III:** Collection of time-series data (1990–2019) for the indicators in selected countries (twenty-seven countries in Asia and Africa);
- **Step IV:** Quantification of the interlinkages identified from **Step I** using statistical methods with the time-series data collected for the selected countries.

Based on the SDG Interlinkages Tool, the linkages between relevant targets are defined by their causal relationships and identified through a comprehensive literature review or based on expert opinions and stakeholder consultations (Zhou and Moinuddin, 2017). A directional link between a pair targets implies the impact from a change in the source target on the end target. For example, a link from Target 4.3 (equal access to affordable technical, vocational and tertiary education) to Target 8.5 (full and productive employment and decent works) indicates a causal relationship between better education and more opportunities and better capacity for jobs. The identified linkages between relevant targets are further quantified to indicate how strong the links are and whether the links are positive or negative based on the historical data (1990–2019) collected for 27 countries.

24.3 Impacts of COVID-19 on SDGs

Started as a global health emergency endangering tens of millions of lives, the pandemic has unfolded into an unprecedented economic and social crisis affecting the livelihoods and daily lives of billions of people around the world. The pandemic and lockdowns have disrupted supply chains and global trade, dampened market confidence, slashed consumer and investment demand, and pushed many economies into recession. The United Nations and the World Bank estimate the global economy to contract between 3.2 to 5.2 percent (United Nations, 2020i; World Bank, 2020). Experiencing economic downturn unevenly across countries (UNDP, 2020), the Asia-Pacific Economic Cooperation (APEC) region could suffer severely with an estimated contract of real GDP by as much as 2.7 percent in 2020 (Hernando and San Andres, 2020). The crisis has disrupted hundreds of millions of enterprises destroying the livelihoods of nearly half of the global workforce (ILO, 2020) and is pushing more than 70 million additional people into extreme poverty (United Nations, 2020d).

24.3.1 A literature review on the impacts of COVID-19

The pandemic and recession are jeopardizing decades of development progress in many social and economic areas reversing the trajectories of SDG progress. The evolving global crisis has heavily affected Goal 1 (poverty eradication), Goal 2 (hunger and food security), Goal 3 (health and well-being), Goal 4 (education), Goal 8 (economic growth and jobs), Goal 9 (industry and innovation), Goal 11 (sustainable cities), Goal 12 (sustainable production and consumption), and international trade (under Goal 17 on partnerships), among others. With the effects disproportionately attacking the vulnerable groups (poor, women, girls and elderly, etc.), the pre-existing gender gaps (Goal 5), income inequalities (Goal 10) and urban–rural dichotomy (Goal 11) could further deteriorate. Impacts of COVID-19 based on a literature review are synthesized and visualised in Fig. 24.3. A summary of the detailed explanations of the impacts and mapped SDG targets is provided in Table 24.1.

24.3.2 Derived impacts of COVID-19 on SDGs from an interlinkage perspective

The sudden shocks from COVID-19 could change the trajectories of the forty-four mapped SDG targets (called COVID-19-hit targets) identified in Fig. 24.3, which may trigger far-reaching ripple effects among themselves and on other affected targets through the complex web of interactions. The derived impacts may vary depending on: i) the pre-existing trajectories of relevant SDG targets; and ii) the nature of the COVID-19 impact. The pre-existing trajectories include a progressive trend and a regressive trend based on the historical trend (1990–2019) of the targets. The pre-existing trajectories determine four types of linkages between COVID-19-hit targets and affected targets in the pre-COVID-19 era, including a) synergies; b) trade-offs; c) development drag; and d) coupled deterioration (see Table 24.2).

Two types of COVID impact are considered: a negative shock (e.g. negative impact on Target 8.1, economic growth) and a positive shock (e.g. positive impact on Target 9.c, ICT-based innovation). In most of the cases, COVID-19 gave negative shocks (Case I) to COVID-19-hit targets (Table 24.3). If the pre-existing trajectories of COVID-19-hit targets are progressive (upward), negative shocks will decelerate their progress. This will either weaken the synergies (Type I-a) or mitigate the trade-offs (Type I-b) with affected targets. If the pre-existing trajectories of COVID-19-hit targets are regressive (downward), negative shocks will accelerate their deterioration. This will either intensify the development drag (Type I-c) or intensify the coupled deterioration (Type I-d) with affected targets.

There are a few cases that COVID-19 gave positive shocks (Case II) to COVID-19-hit targets (Table 24.4), such as Target 9.3 on ICT-based innovation. Depending on the pre-existing trajectories of both COVID-19-hit targets and

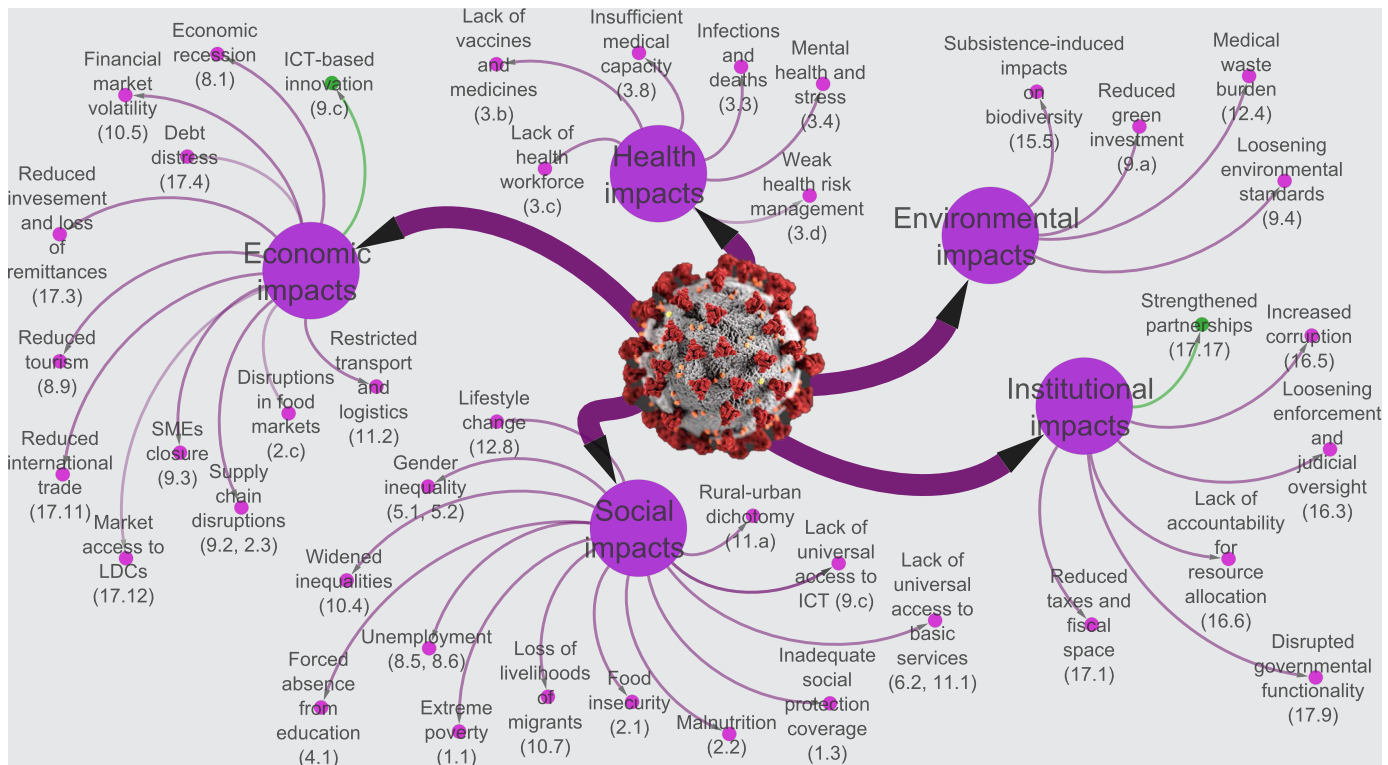


FIG. 24.3 Impacts of COVID-19 and mapped SDG targets. *Note:* Codes in bracket are the mapped SDG targets. Purple-Negative impacts; Green-Positive impacts.

TABLE 24.1 Major impacts from COVID-19 based on a literature review.

SDGs	Targets	Major impacts	Sources
Goal 1	1.1 End extreme poverty	70 million more will be added to the existing 700 million people in extreme poverty.	(United Nations, 2020d)
	1.3 Social protection for all	The existing low level of coverage has limited governmental capacity to respond to the growing needs from the crisis.	(Kidd, Athias and Tran, 2020; United Nations, 2020d)
Goal 2	2.1 End hunger and ensure food security	130 million people will go hungry in 2020 and long-term food security will be affected due to income losses and rising food prices.	(FAO and WFP, 2020; FAO et al., 2020; United Nations, 2020d)
	2.2 End malnutrition	Today, 3 billion people cannot afford a healthy diet. A quarter-plus children under five were stunted. COVID-19 has worsened malnutrition particularly among the poor.	(FAO et al., 2020)
	2.3 Double agricultural productivity	Food supply chain disruptions, unavailability of inputs, shortfall of labour supply and diminished demand resulted from the lockdowns have damaged agricultural production. Small farmers are facing acute food insecurity.	(United Nations, 2020d)
Goal 3	3.3 End epidemics of communicable diseases	The global pandemic has led to dozens of millions of infections and hundreds of thousands losing their lives. People with pre-existing health conditions are at higher risk.	(Mori, 2020; WHO, no date)
	3.4 Mental health and well-being	Psychological distress is widespread due to physical distance, fear of infection, worries from losing jobs, and deep anxiety about future. Frontline healthcare workers, elderly, women and children are at higher risk.	(United Nations, 2020a)
	3.8 Universal health coverage	The healthcare systems have been devastated due to lack of capacity to accommodate, test and treat COVID-19 patients and disruptions in the regular functionalities to serve non-COVID-19 patients.	(WHO, no date)

(continued)

TABLE 24.1 (Cont'd)

SDGs	Targets	Major impacts	Sources
	3.c Health workforce recruitment	COVID-19 placed huge risks, both physically and mentally, on the frontline health workers, particularly women workers who account for the majority of the workforce.	(United Nations, 2020a; WHO, 2020a)
Goal 4	4.1 Quality primary and secondary education for all	More than 100 countries announced temporary school closure impacting more than 60 per cent of students worldwide which may result in permanent out-of-school to the poor.	(UNESCO, 2020; United Nations, 2020d)
Goal 5	5.1 End gender discrimination	Gender inequality is widening resulted from the deprivation from sexual and reproductive health services, increased unpaid care works and higher risk of losing income.	(UNFPA, 2020; United Nations, 2020f)
	5.2 Eliminate all forms of gender-based violence	Intensified economic and social stress exacerbated by movement restrictions and social isolation is driving a steep increase in gender-based violence in some countries.	(UN Women, 2020)
Goal 6	6.2 Access to adequate sanitation and hygiene for all	Existing poor hygiene in developing countries and rural areas is another main route of coronavirus transmission.	(WHO and UNICEF, 2020b)
Goal 8	8.1 Sustain economic growth	Plant closures and restricted labour supply are impacting global supply chains, trade, investment, and commodity prices. The lockdown is affecting tourism and hospitality. A decade-low global growth of 2.3 per cent in 2019 and worse in 2020 was estimated.	(United Nations, 2020c, United Nations, 2020h)
	8.5 Full and productive employment for all	5 to 25 million jobs could be lost, with SMEs, informal sector, self-employed, daily wage earners, and migrant and women workers being hit the hardest.	(United Nations, 2020e)
	8.9 Sustainable tourism	Restrictions of movement and social distancing are affecting the service industry, particularly tourism and hospitality.	(United Nations, 2020h)
Goal 9	9.2 Inclusive and sustainable industrialisation	Manufacturing industries have been affected hardly disrupting economic activities across the globe through the global value chains.	(UNCTAD, 2020)
	9.3 Promotion of SMEs	SMEs, making up 96% of enterprises, employing 62% of workers and contributing 42% of GDP in part of Asia, is attacked the hardest, causing massive shutdowns, layoffs and bankruptcies.	(ADB, 2020b)
Goal 10	10.4 Achieve greater equality	Inequalities have been widened due to the pre-existing conditions in living conditions, access to handwashing facilities, occupations, and access to social protection system and quality health care.	(DESA, 2020d)
	10.5 Ensure financial soundness	Global investment and finance markets will face a downturn, marked by extreme volatility, capital outflows from developing countries, and looming debt distress.	(DESA, 2020a)
Goal 11	11.1 Access to adequate housing and basic services and upgrade slums	Urban areas have become the epicentre of the pandemic in terms of the overriding share in COVID-19 cases. Pre-existing inequalities and conditions can impact disproportionately on more vulnerable groups.	(United Nations, 2020b)
Goal 15	15.5 Halt biodiversity loss	Around 60 per cent of all infectious diseases in humans are zoonotic including COVID-19, which are often associated with ecological degradation through agricultural intensification or encroachments into forests and other habitats.	(UNEP, 2016)
Goal 17	17.4 Attain long-term debt sustainability	44 per cent of least developed and other low-income countries are currently in debt distress, which could be worsened due to global economic turmoil and commodity price shocks.	(United Nations, 2020c)
	17.11 Increase exports of developing countries	International trade is plummeting leading to a drop by 13 – 32 per cent in merchandise trade in 2020. The most affected sectors include precision instruments, machinery, automotive and communication equipment.	(UNCTAD, 2020; WTO, 2020)

Source: Compiled by authors. The mapping with SDG targets was conducted based on matching the text and the knowledge of the authors about SDGs.

TABLE 24.2 Types of SDG interlinkage in the pre-COVID-19 era.

Pre-existing trajectories and types of linkage		Affected targets	
		Progressive trend \uparrow	Regressive trend \downarrow
COVID-19-hit targets	Progressive trend \uparrow	Type a. Synergies	Type b. Trade-offs
	Regressive trend \downarrow	Type c. Development drag	Type d. Coupled deterioration

Source: Authors based on Zhou, Moimuddin and Li (2019).

TABLE 24.3 Case I: Negative shock from COVID-19 and types of derived impact on SDGs.

Case I. Negative shock		Affected targets	
Pre-existing trajectories and types of linkage		Progressive trend \uparrow	Regressive trend \downarrow
COVID-19-hit targets	Progressive trend \uparrow	Type I-a. Weaken the synergies	Type I-b. Mitigate the trade-offs
	Regressive trend \downarrow	Type I-c. Intensify development drag	Type I-d. Intensify coupled deterioration

Source: The authors.

TABLE 24.4 Case II: Positive shock from COVID-19 and types of derived impact on SDGs.

Case II. Positive shock		Affected targets	
Pre-existing trajectories and types of linkage		Progressive trend \uparrow	Regressive trend \downarrow
COVID-19-hit targets	Progressive trend \uparrow	Type II-a. Strengthen the synergies	Type II-b. Intensify the trade-offs
	Regressive trend \downarrow	Type II-c. Mitigate development drag	Type II-d. Mitigate coupled deterioration

Source: The authors.

the affected targets, derived impacts will include four types: i) strengthen the synergies (Type II-a); ii) intensify the trade-offs (Type II-b); iii) mitigate development drag (Type II-c); and iv) mitigate coupled deterioration (Type II-d).

It should be mentioned that the classification of various derived impacts from COVID-19 is based on the assumption that the shocks will not change the nature of the pre-existing trajectories, such as from an upward trend to a downward trend. This assumption is made for the SDG interlinkage analysis in this study due to the limitation of the capacity of the existing SDG Interlinkages Tool in dealing with a qualitative change.

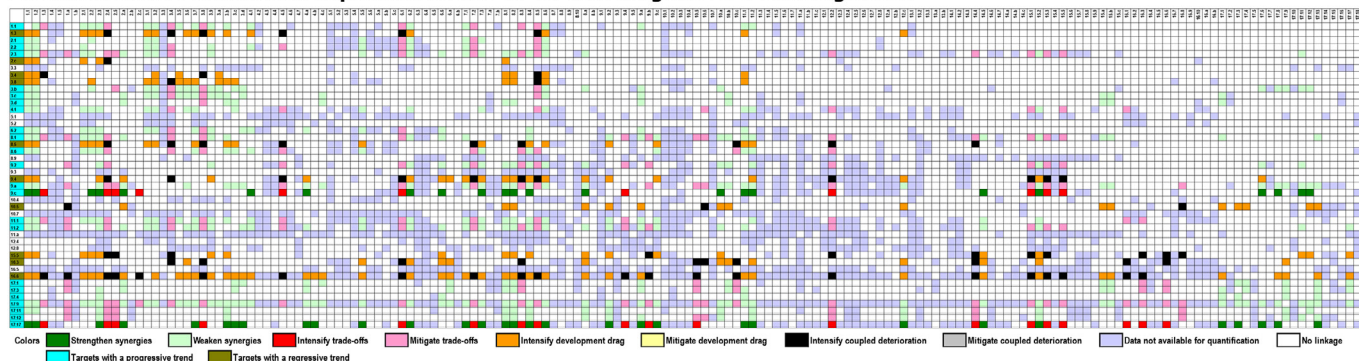
To show how the SDG Interlinkages Tool is used to assess the derived impacts from COVID-19-hit targets on SDGs, an empirical analysis for Bangladesh and the Republic of Korea was conducted. While the Republic of Korea was one of the countries where the coronavirus infection started very early, the country has remained one of the least infected countries in the world (CSSE, 2020). In Bangladesh, where confirmed cases already exceeded 300 thousand, daily life and businesses are still far from normal as the authorities continue to try to control the pandemic. The recovery measures from the two countries are also quite different: Bangladesh's recovery measures appear to be short-term focusing on pandemic control, supporting the poor and recovery of the economy by stimulating businesses and trade, while the Korean measures are a mix of short and medium-term ones with longer-term implications for making the country more sustainable. Analyzing these two Asian countries with very different realities can provide useful insights and lessons that can be applied to other countries as well.

The results of the derived impacts are presented in a dashboard, a matrix, with COVID-19-hit targets placing on the row and affected targets placing on the column (see Appendix AI and Appendix AII). Colors indicate different types of derived impacts based on the classification provided in Table 24.3 and Table 24.4.

24.3.2.1 Derived impacts of COVID-19 on SDGs in Bangladesh

The dashboard on the derived impacts on SDGs in Bangladesh is presented in Appendix AI. Among forty-four COVID-19-hit targets, except for Target 9.3 on ICT-based innovation and Target 17.7 on strengthening public and

AI. Dashboard on the derived impacts of COVID-19 on achieving the SDGs in Bangladesh



APPENDIX AI Dashboard on the derived impacts of COVID-19 on achieving the SDGs in Bangladesh.

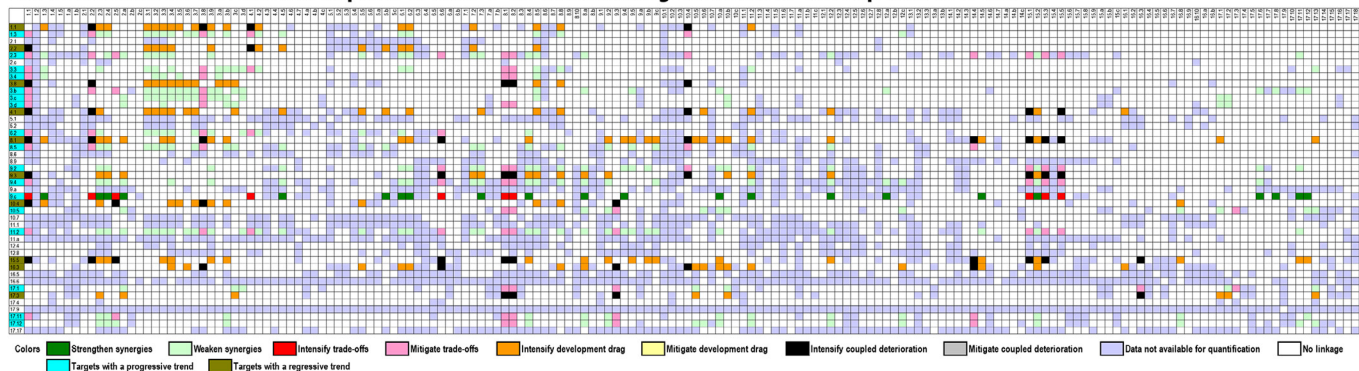
private partnerships, all other targets received negative shocks from COVID-19 decelerating their progress. Twenty-one targets have followed a progressive trend in the pre-COVID-19 time, such as Targets 1.1 and 1.2 on poverty eradication and Targets 2.1 and 2.2 on hunger and malnutrition reduction. Their derived impacts will weaken the existing synergies (Type I-a), such as with universal access to primary education (Target 4.1), or mitigate the trade-offs (Type I-b), such as with some environmental targets (Targets 12.2 and 15.5). However, the mitigated trade-offs with the environment is temporary due to the slowdown of economic activities rather than driven by a structural change or technological breakthrough.

Some of the existing trade-offs have resulted from limited public resources in Bangladesh which have been allocated only for a few priority areas, such as extreme poverty eradication, but leaving other development areas lagged behind. These include Targets 1.3 (coverage of social protection system), Target 6.1 (full access to safe drinking water) and Target 8.3 (formalization of informal sectors and growth of SMEs), etc. Due to tightened public resources during the crisis, priorities will be given to address the urgent needs, particularly in the health-related areas. The existing gaps in the lagged-behind areas can be widened.

For Targets 9.3 and 17.7, COVID-19 will accelerate their development through positive shocks. Their progress will strengthen the synergies (Type II-a), such as with improved school education (Targets 4.1 and 4.a) and efficiency improvement (e.g. Targets 2.3 on agricultural productivity and 7.3 on energy efficiency improvement). However, the progress in Targets 9.3 and 17.7 may also intensify the pre-existing trade-offs (Type II-b), such as with some environment targets (9.4 on industrial pollution and 12.2 on resource consumption, etc.).

Ten targets have shown a regressive trend in the pre-COVID-19 era, including Target 1.3 on social protection system, Target 8.5 on full and productive employment and Target 9.4 on emissions from industrial sectors, etc. Further deterioration in these areas driven by COVID-19 will intensify the development drag (Type I-c) to affected targets, such as poverty eradication (Targets 1.1 and 1.2), or intensify coupled deterioration (Type I-d) with affected target areas, such as coverage of social protection system (Targets 1.3) and gender disparity in education (Target 4.5), among others.

AII. Dashboard on the derived impacts of COVID-19 on achieving the SDGs in the Republic of Korea



APPENDIX AII Dashboard on the derived impacts of COVID-19 on achieving the SDGs in the Republic of Korea.

Without proper measures to curb the negative impacts across SDGs, particularly the intensified trade-offs, development drags and coupled deterioration, the existing gaps in achieving the 2030 targets in Bangladesh will be widened.

24.3.2.2 *Derived impacts of COVID-19 on SDGs in the Republic of Korea*

The dashboard on the derived impacts on SDGs in the Republic of Korea is presented in [Appendix AII](#). Among forty-four COVID-19-hit targets, 16 targets have followed a progressive trend in the pre-COVID-19 time, including many targets related to good health and well-being (Goal 3), universal access to basic services (Target 1.3, 6.2, and 11.2), industrial development (Targets 9.2, 9.4, 9.c) and international trade (Target 17.11 and 17.12). COVID-19 gave negatively shocks to these 15 target areas decelerating their progress towards achieving the 2030 targets. The derived impacts from 16 targets will weaken the synergies (Type I-a), such as with Targets 2.1 and 2.2 on hunger and malnutrition reduction, or mitigated the existing trade-offs (Type I-b) with affected targets, such as some environment-related targets (Targets 14.4, 15.1, 15.3, and 15.5). Again, the weakened trade-offs with environment targets will be temporarily due to the slowdown of relevant activities.

Targets 9.3, which was provided a positive shock from COVID-19, will be accelerated for its development. The derived impacts will strengthen the synergies (Type II-a) with affected targets, such as gender parity in access to all levels of education (Target 4.5). However, the derived impacts also include intensified trade-offs (Type II-b) with affected targets, such as eliminating extreme poverty (Target 1.1) if relevant technology and services are not accessible or affordable to the poor.

Ten targets have shown a regressive trend in the pre-COVID-19 era, including Target 2.2 on malnutrition, Target 3.8 on healthcare coverage, Target 8.1 on sustained economic growth, Target 9.3 on the development of SMEs, Target 10.4 on greater equality, and Target 15.5 on loss of biodiversity. These ten targets will be further deteriorating with negatively shocks from COVID-19. The derived impacts will intensify the development drag (Type I-c) to affected targets, such as improvement in social protection systems (Target 1.3), or intensify coupled deterioration (Type I-d), such as with worsened rule of law (Target 16.3).

For the Republic of Korea, major concerns on the derived impacts on SDGs will include relevant targets under Goals 3 (health-related targets), 8 (economic growth), 9 (industries and SMEs), 10 (inequalities), and environment-related targets (Goal 15). The recovery measures aiming to address the impacts from COVID-19 need to take account of the derived impacts.

24.4 Implications of COVID-19 measures for achieving the SDGs: A review from an SDG interlinkage perspective

The spread of the COVID-19 pandemic and prolonged disruptions in the daily activities and businesses has prompted the governments to implement various stimulus measures to sustain and revive the economy, to support business communities especially the SMEs, and to provide financial support to individuals. These measures vary significantly by countries, depending particularly on the levels of economic development and availability of fiscal resources. Most of the Asian countries have typically focused on short-term responses to counter the pandemic, to revive the economy and to ensure the urgent needs of the poor and vulnerable. COVID-19 measures in only a few Asian countries, such as the Republic of Korea, have paid attention to green and sustainable recovery.

24.4.1 COVID-19 measures in selected Asian countries

The COVID-19 measures for Bangladesh and the Republic of Korea were summarised based on a literature review and mapped with relevant SDG targets. The mapping is done by the authors with a careful review of the objectives of the measures from their wording and then comparing them with the whole set of the SDG targets.

24.4.1.1 *Bangladesh*

Faced with a severe outbreak of COVID-19 in Bangladesh, the Government has taken various measures including lockdown and social distancing, prolonged suspension of business and educational activities and multiple stimulus packages and other forms of incentives to support businesses and individuals (see [Table 24.5](#)). Most of these measures are short-term focusing on quick economic recovery and the industry sector. Some measures focus on protecting the workers, particularly by providing incentives to the industries to avoid lay-offs. For the poor and vulnerable

TABLE 24.5 Summary of major COVID-19 measures for Bangladesh.

Domain	Type of measures	Description	Mapped SDG targets
Economy-related	Economic stimulus packages	Stimulus package for exporting industries:	
		• Working capital loan facilities to the affected industries, including SMEs;	9.2, 9.3
		• Enhancing the Export Development Fund and pre-shipment credit refinance scheme;	17.11
		• Agriculture refinance scheme and incentives for farm mechanization;	2.3, 2.a
		• Low-interest credit facilities for self-employment ventures and refinancing scheme for low-income traders and farmers in the agricultural sector;	9.3, 2.a
		• Promotion of payment services including mobile payment options.	9.c, 8.10
	Direct/indirect tax measures	Lifting of import tax on medical equipment and extension of filing/payment of tax returns.	3.3, 3.8, 9.3, 17.11
Society-related	Direct benefits	Direct cash transfer to selected families.	1.1, 1.3, 2.1, 10.1
	Employment/social security	• Workers' layoff prohibition, mandatory salary payment (one month);	8.5, 8.8, 1.3
		• World Bank's COVID-19 Emergency Response and Pandemic Preparedness Project;	3.3, 3.8, 3.c
		• ADB's assistance to fight the pandemic.	3.c
	Healthcare	Advance payment from banks for imports of life-saving drugs.	3.8, 3.b
Environment-related		Tax exemption for private power generation companies.	7.1, 7.2
Miscellaneous	Other measures	Loan for working capital of the national airlines.	8.5, 11.2

Source: Compiled based on several sources (ADB, 2020a; IISD et al., 2020; IMF, 2020; KPMG, 2020a). The mapping of the measures with SDGs is done by the authors.

sectors, the government also introduced several cash benefits and direct transfer schemes. According to ADB (2020a), Bangladesh's packages sum up to a little over US\$12 billion (US\$74.86 per capita), which is equivalent to 3.74% of 2019 GDP. With a major focus on livelihood and economic recovery, environmental aspects are largely absent in the existing recovery measures.

24.4.1.2 Republic of Korea

With less than twenty thousand COVID-19 cases and 323 deaths until the end of August 2020 (CSSE, 2020), the Republic of Korea appears to have managed the pandemic relatively better than most other countries in Asia and around the globe. In addition, the government has taken advanced and wide-ranged COVID-19 recovery measures covering all the three dimensions of sustainability (Table 24.6). The economic stimulus packages totalled over US\$235 billion (US\$4,558 per capita), about 15% of 2019 GDP (ADB, 2020a). A major highlight of the Korean measures is the adoption of the Korea New Deal, which offers a vision for a sustainable future. Some major transformations in the economy, particularly through green technology, digitalization and green jobs are envisioned.

24.4.2 An SDG interlinkage analysis of the implications of COVID-19 measures

COVID-19 measures will exert short or medium to long-term impacts on achieving the SDGs. To understand the implications of COVID-19 measures for SDGs, an SDG interlinkage analysis of the mapped SDG targets were conducted. Potential impacts on SDGs through different types of interlinkages follow the classification provided in Table 24.3 and Table 24.4 by replacing the COVID-19-hit targets with the mapped targets for COVID-19 measures. COVID-19 measures such as incentives for businesses or benefits for the poor will boost many of the mapped targets accelerating their progress. However, certain measures such as tax reduction measures may impact negatively on government revenue (Target 17.1) and worsen the existing debt distress (Target 17.4) exerting negative impacts on these areas. The prolonged lockdown measures are included as the impacts from COVID-19 in Section 24.3.

TABLE 24.6 Summary of major COVID-19 measures for the Republic of Korea.

Domain	Type of measures	Description	Mapped SDG Targets
Economy-related	Economic Stimulus packages	• Korean New Deal focusing on digital economy, green technology and social safety nets;	1.3, 8.1, 8.2, 8.4, 9.2, 9.4, 9.5, 9.c, 13.2,
		• Loans/assistance for SMEs;	9.3, 10.5
		• Monetary Policies (purchasing local bonds, lowering of interest rates and loan facilities for small companies);	17.1, 17.3, 10.5, 17.4
		• Equity support through the creation of a stock market stabilization fund;	17.3, 10.5
		• Key industry stabilization fund (airlines, shipping, shipbuilding, autos, general machinery, electric power, and communications).	9.2, 17.5
	Direct/indirect tax measures	• Various tax support for rental business owners, SMEs and for overseas' companies return to Korea;	9.3, 17.1, 17.5
		• Temporary relief for value-added tax;	9.3, 17.1
		• Consumption tax reduction (temporary) on car purchases by individuals;	9.2, 9.3, 9.c, 12.8, 12.c
		• Increase (temporary) in income tax deduction rate for credit card/other expenses;	9.2, 9.3, 12.8
		• Increase (temporary) of the limitation amount for entertainment expenses;	8.9, 9.3
	• Various customs measures (delayed duty payment, suspension of Customs audits suspension, paperless duty drawback, etc.).	17.11, 17.1, 17.10	
Society-related	Food, social security	Emergency caring support for vulnerable citizens including pregnant women;	1.1, 2.1, 3.8, 10.1, 3.1
	Employment	New job creation (1.9 million jobs expected);	8.5, 8.6
	Healthcare	• Comprehensive testing and tracking; • Export ban (temporary) on certain medical items;	3.3, 3.8 3.3, 17.11, 3.8, 17.10
Environment-related	Energy-specific	Financing for clean energy infrastructure, including for improving energy infrastructure in industries;	7.2, 7.b
	Environment	• Korean New Deal: carbon tax, coal phasing out, hydrogen strategy, renewable energy investments, and a Regional Energy Transition Centre to support workers transition to green jobs; • Green transformation of living infrastructure; • Green industry ecosystem; • Energy infrastructure improvement; • Energy digitalization; • Low-carbon transition; • Innovative green industry support, including green SMEs; • Smart green cities, including Seoul COVID-19 Relief for building a Smart Green City in Seoul; • Energy efficient buildings; • Seoul COVID19 Relief: Green Job Creation	7.2, 8.5, 9.4, 12.c, 13.2 9.1, 9.a, 14.2, 15.1, 15.2, 15.3, 15.4, 15.5 9.2, 9.4, 12.2 7.b 9.c 7.2, 13.2 9.2, 9.4, 12.2 11.3, 11.5, 11.6 11.c 8.4, 8.5, 8.6
Miscellaneous	Other measures	• Bailout of Airline Companies; • Bailout of Doosan Heavy Industries & Construction Co.	8.5, 9.2, 13.2 8.5, 9.2, 13.2

Note: The policy measures have been identified by reviewing several sources: [ADB, 2020a](#); [IISD et al., 2020](#); [IMF, 2020](#); [KPMG, 2020b](#). The mapping of the measures with SDGs is done by the authors.

24.4.2.1 Implications of COVID-19 measures for SDGs in Bangladesh

For Bangladesh, twenty SDG targets were mapped with COVID-19 measures (Table 24.5). The implications of the mapped SDG targets for SDGs are presented in a dashboard in Appendix AIII. Among the twenty targets, twelve targets have followed a progressive trend in the pre-COVID time, such as poverty eradication (Target 1.1), end hunger (Target 2.1), access to basic services (Targets 3.b, 7.1, 8.10, 9.c, etc.), agricultural productivity and extension (Targets 2.3 and 2.a), industrialization (Target 9.2) and increase of exports (Target 17.11). Stimulating the progress in these twelve target areas may strengthen the existing synergistic effects (Type II-a) across the SDGs, particularly related to the social dimension, such as poverty eradication, end hunger, improvement in health and well-being and access to basic services. However, promotion of these areas may also intensify the existing trade-offs with some SDGs (Type II-b), particularly related to the environment, such as loss of biodiversity and ecosystem degradation (Goals 14 and 15).

Among the twenty mapped targets, four targets have shown a regressive trend in the pre-COVID-19 era, including social protection system (Targets 1.3), access to healthcare systems (Target 3.8), development of renewable energy (Target 7.2) and full and productive employment (Target 8.5). Accelerating the progress in these four target areas through COVID-19 measures will help mitigate the existing development drag (Type II-c) or mitigate coupled deterioration (Type II-d), particularly in the social and economic dimensions, such as health targets (Goal 3), gender parity in access to education (Target 4.5), access to safe drinking water (Target 6.1), and full and productive employment (Target 8.5).

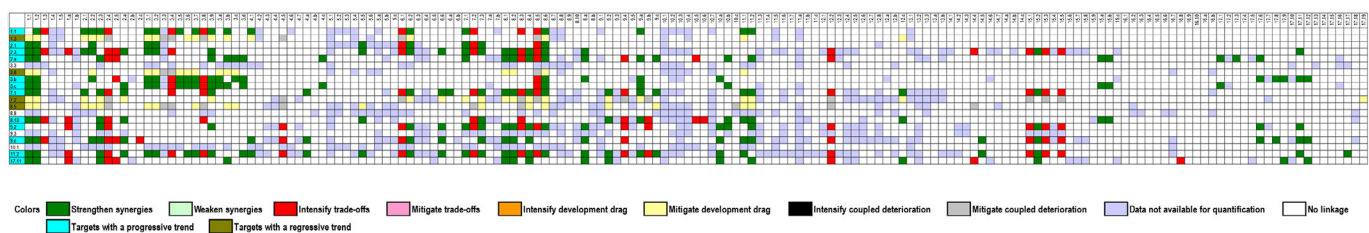
24.4.2.2 Implications of COVID-19 measures for SDGs in the Republic of Korea

For the Republic of Korea, forty-three SDG targets were mapped with COVID-19 measures (Table 24.6). The implications of the mapped SDG targets for SDGs are presented in Appendix AIV. Among these forty-three targets, sixteen target areas have been developed with a progressive trend in the pre-COVID-19 period, including improvement in social protection system (Target 1.3), promotion of renewable energy (Target 7.2), resource efficiency enhancement (Targets 8.4 and 12.2), full and productive employment (Target 8.5), industrial development and upgrading (Targets 9.2, 9.4, 9.5, 9.c), building sound financial systems (Targets 10.5, 17.1) and expanding exports (Target 11.1), etc. Stimulating further progress in these areas through COVID-19 measures will strengthen the synergistic effects across the SDGs (Type II-a), particularly among themselves and with the targets related to upgrading productive sectors (agriculture and industry), health and well-being (Goal 3) and access to basic services (education, water and sanitation, etc.). However, promotion the sixteen target areas will also intensify the existing trade-offs (Type II-b), such as between the promotion of renewable energy (Target 7.2) and economic growth (Targets 8.1 and 8.2).

Nine mapped target areas have been deteriorated in the past two decades, including healthcare coverage (Target 3.8), economic growth (Targets 8.1 and 8.2), development of SMEs (Target 9.3), and ecological degradation (Targets 15.1, 15.3 and 15.5). Some specific COVID-19 measures aiming to stimulate the progress in these areas may help relax the persistence of development drags (Type II-c) or mitigate coupled deterioration (Type II-d linkages), particularly related to health and well-being (Goal 3), development and upgrading of productive sectors (agriculture, industry, etc.).

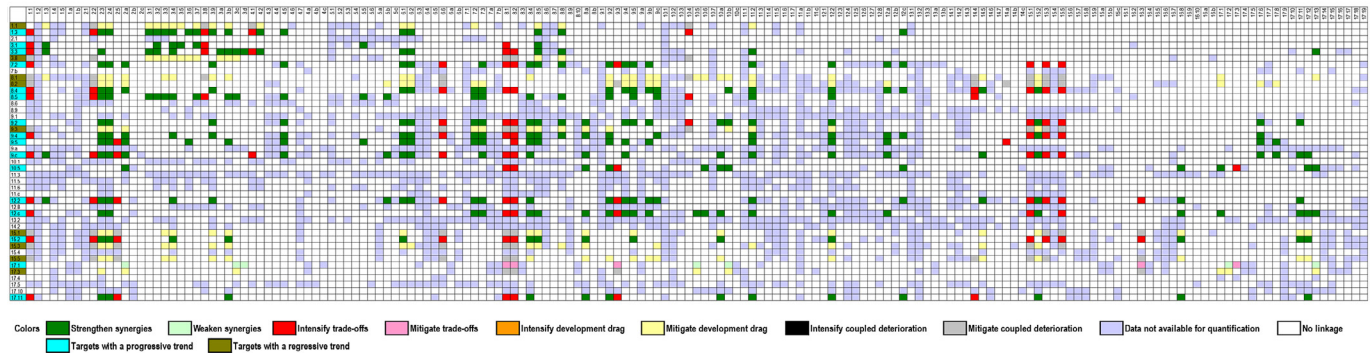
Some of Korea's COVID-19 measures such as tax reduction may impact negatively on government revenue (Target 17.1) and fiscal stability (Target 17.4). Having maintained stability in the past two decades, substantial reduction in government revenue stimulated by the COVID-19 measures can weaken the existing synergies (Type I-a) with relevant SDG targets, particularly related to public investment (such as Target 2.a on rural infrastructure), financial stability (Target 10.5), macroeconomic stability (Target 17.13) and assistance to developing countries (Targets 10.6 and 17.2), etc.

AIII. Dashboard on the impacts of COVID-19 measures on achieving SDGs in Bangladesh



APPENDIX AIII Dashboard on the impacts of COVID-19 measures on achieving SDGs in Bangladesh.

AIV. Dashboard on the impacts of COVID-19 measures on achieving SDGs in the Republic of Korea



APPENDIX AIV Dashboard on the impacts of COVID-19 measures on achieving SDGs in the Republic of Korea.

24.5 Discussion

In this section, two critical issues around the effectiveness of COVID-19 recovery in addressing the impacts on SDGs and its implications for building long-term resilience and sustainability will be discussed. Furthermore, how to understand the SDG interlinkage analysis and its results, as well as the limitations of the existing method will be discussed.

24.5.1 Effectiveness of COVID-19 measures in addressing the impacts on SDGs

The pandemic and associated social and economic crises have widely impacted on achieving the SDGs. For building back better, it is expected that COVID-19 recovery can play an important role to curb the retreating and serve as an impetus to SDG acceleration. For Bangladesh, by comparing COVID-19 measures with the COVID-19-hit targets, it can be found that the COVID-19 measures were designed mainly to address the urgent needs for supporting the livelihoods of vulnerable people and the operations of SMEs. Some COVID-19-hit areas such as access to basic services which require medium to long-term investment to improve are not included reflecting the country's limitation in financial capacity.

Many COVID-19 measures, such as promoting poverty eradication, agricultural productivity improvement and transportation, etc. will strengthen the synergies across the SDGs contributing to SDG acceleration. However, they may also intensify the existing trade-offs. Managing the trade-offs is an integral part of COVID-19 measures. For Bangladesh, many trade-offs related to the environment (such as industrial pollution and degradation in ecosystems and their services), were out of the existing measures. Leaving these regressive areas unaddressed as trade-offs will in turn drag the progress in achieving the 2030 targets.

For the Republic of Korea, it can be found that the COVID-19 measures cover most of the COVID-19-hit areas, imply that the COVID-19 measures may possibly curb SDG retreating and push back to the original track. Promotion of social protection system, ensuring full and productive employment and enhancing industrial development, etc. will strengthen many synergies across the SDGs and help SDG acceleration. For managing the trade-offs, many of the trade-off areas have been included. However, some of the trade-offs such as access to quality primary and secondary education and achieving greater equalities were out of the existing COVID-19 measures and need to be paid special attention.

One feature of the recovery package in the Republic of Korea is that it covers additional environmental target areas which are beyond the scope of the impacts from COVID-19. These include renewable energy, climate mitigation and using economic and market mechanisms, conservation of marine and ocean ecosystems, and broader areas of terrestrial ecosystems conservation. An environmental-sound recovery will benefit the well-being of both human and the environment in the long-run.

24.5.2 Implications for building long-term resilience and sustainability

In the wake of the COVID-19 pandemic, the international communities as well as many countries highly recognised the vulnerability of individuals, communities, societies, and many global systems such as the global value chains

exposed from the crisis. There is a growing call that the recovery from COVID-19 should aim at building back better with enhanced resilience and sustainability to prevent or mitigate similar crises that may happen in the future. Using the lens of resilience and sustainability to review the recovery measures is therefore indispensable.

The interlinkage analysis of the impacts of COVID-19 and its recovery for Bangladesh and the Republic of Korea intuitively demonstrates the significance of resilience building. For example, the poor and marginalised people in both countries appear to be vulnerable to the crisis. In Bangladesh, the poor were directly hit and will be affected extensively through derived impacts such as from health damage, disrupted agricultural production and associated food insecurity, dropping out of school education, interrupted provision of basic services, or losing incomes due to the closures of SMEs. Lagged-behind social protection system in Bangladesh exacerbate the compounding effects on poverty. In the Republic of Korea, the existing regressive trend in poverty elimination will be worsened due to the hit by COVID-19 and through derived impacts, such as from damaged healthcare system, interrupted primary and secondary education, and contracted economic growth.

The lessons from the COVID-19 crisis suggest that governmental plans and recovery policies should take account of resilience building as an integral part from a preventive perspective to enhance the preparedness for future crises, such as those induced by climate change. The Korean New Deal appears to provide a broader and longer-term framework that takes into consideration several aspects of resilience building, particularly on building environmental resilience.

24.5.3 Understanding SDG interlinkages and limitations of SDG interlinkage analysis

It is worth mentioning some of the caveats of the analysis in this chapter and charting out some future research agenda. First, the SDG interlinkage analysis is based on the historical data which limits its capacity to assess the actual acute changes driven by the COVID-19 crisis. Latest data including the COVID-19 time period may be needed in the future study to reflect the actual effects from the shocks. Second, the analysis is based on the IGES' SDG Interlinkages Tool, which provides a generic mapping of the linkages among relevant SDG targets and does not include country-specific situations. Consultations with relevant stakeholders in the covered countries may help provide special insights on the country's context to build a customised SDG interlinkage model for individual countries. Third, the compilation of the COVID-19 measures have been selective and may not reflect all the newest and planned ones. Furthermore, listing up of the measures and associated mapping with the SDGs may have generalised some of the unique aspects and thus may not capture all the aspects of a given measure. A closer look into each of the measures, including the details of the contents, may be necessary to make the mapping more accurate and useful.

24.6 Conclusion

Five years after the SDGs were adopted and just when the United Nations called for realising the Decade of Action, the COVID-19 pandemic halted the progress of the SDGs and even reversed some of the achievements that the world made over years. With most countries struggling to overcome the pandemic and revive the economy, losing the focus on the SDGs is not an unlikely thing. This chapter attempts to provide a methodology to understand how the COVID-19 crisis, as well as the measures addressing the crisis, will affect the progress of the SDGs in selected Asian countries and to know what can be done to ensure that COVID-19 measures support accelerating the implementation and achievement of the SDGs and building resilience and sustainability in the long run.

Through literature review and using the SDG Interlinkages Tool, a methodology on analyzing the impacts from COVID-19 and its recovery on SDG was proposed from an interlinkage perspective. The proposed methodology was then used for an empirical analysis for two selected Asian countries, Bangladesh and the Republic of Korea. The two countries are different in their pre-existing levels of economic development, fiscal capacity and other social and economic conditions which in turn determine their varied impacts from COVID-19 and associated countermeasures.

The SDG interlinkage analysis provides a wider picture about the impacts of COVID-19 including the derived impacts from COVID-19-hit targets and the implications of COVID-19 measures for SDGs through the complex web of interactions among the SDGs. By identifying and analyzing the synergies and trade-offs of the COVID-19 measures, this study provided relevant knowledge and methodology to support an integrated planning for COVID-19 measures which can be used not only in the two selected countries but also in other countries.

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References

- ADB, 2020a. ADB COVID-19 Policy Database. Available at: <https://covid19policy.adb.org/> (Accessed: 29 August 2020).
- ADB, 2020b. Responding to COVID-19: Lessons from Previous Support to Micro, Small, and Medium-Sized Enterprises. Synthesis Note No. 3. Available at: <https://www.adb.org/sites/default/files/evaluation-document/610716/files/synthesis-note-3.pdf>.
- CSSE, 2020. COVID-19 Dashboard of the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University. Available at: <https://coronavirus.jhu.edu/map.html> (Accessed: 29 August 2020).
- DESA, 2020a. Corona crisis causes turmoil in financial markets. Policy Brief No. 59. Available at: <https://www.un.org/development/desa/publication/un-desapolicy-brief-59-corona-crisis-causes-turmoil-in-financial-markets/>.
- DESA, 2020b. COVID-19: Addressing the social crisis through fiscal stimulus plans. Available at: <https://www.un.org/development/desa/socialperspectiveondevelopment/2020/04/06/covid-19-addressing-the-social-crisis-through-fiscal-stimulus-plans/> at: http://www.un.org/en/development/desa/policy/wesp/wesp_current/2011wespupdate.pdf.
- DESA, 2020d. Responses to the COVID-19 catastrophe could turn the tide on inequality. Policy Brief #65. Available at: <https://www.un.org/development/desa/dpad/publication/un-desapolicy-brief-65-responses-to-the-covid-19-catastrophe-could-turn-the-tide-on-inequality/> (Accessed: 11 September 2020).
- DESA, 2020c. COVID-19: Disrupting lives, economies and societies, Briefing No. 136 April. DESA. http://www.un.org/en/development/desa/policy/wesp/wesp_current/2011wespupdate.pdf.
- ESCAP, 2020. Asia and the Pacific SDG Progress Report 2020. United Nations Economic and Social Commission for Asia and the Pacific. Available at: https://www.unescap.org/sites/default/files/publications/ESCAP_Asia_and_the_Pacific_SDG_Progress_Report_2020.pdf.
- FAO, 2020. The State of Food Security and Nutrition in the World 2020: Transforming Food Systems for Affordable Healthy Diets. FAO, IFAD, UNICEF, WFP and WHO, Rome. doi:10.4060/ca9692en.
- FAO and WFP, 2020. FAO-WFP early warning analysis of acute food insecurity hotspots. FAO and WFP. doi:10.4060/cb0258en.
- Hernando, R.C., San Andres, E.A., 2020. APEC in the Epicentre of COVID-19. Policy Brief No. 31. Available at: <https://www.apec.org/Publications/2020/04/APEC-in-the-Epicentre-of-COVID-19>.
- IISD, 2020. Energy Policy Tracker - Track funds for energy in recovery packages. Available at: <https://www.energypolicytracker.org> (Accessed: 1 September 2020).
- ILO, 2020. ILO Monitor: COVID-19 and the world of work. Updated estimates and analysis. Available at: https://www.ilo.org/wcmsp5/groups/public/-dgreports/-dcomm/documents/briefingnote/wcms_743146.pdf.
- IMF, 2020. Policy Tracker - Policy Responses to COVID-19. Available at: <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19#V> (Accessed: 1 September 2020).
- Kidd, S., Athias, D., Tran, A., 2020. Addressing the COVID-19 Economic Crisis in Asia through SOcial Protection. J. Chem. Inf. Mod. Available at: <https://www.undp.org/content/undp/en/home/librarypage/poverty-reduction/addressing-covid-19-economic-crisis-in-asia-through-social-protection.html>.
- KPMG, 2020a. Bangladesh - Government and institution measures in response to COVID-19. Available at: <https://home.kpmg/xx/en/home/insights/2020/04/bangladesh-government-and-institution-measures-in-response-to-covid.html> (Accessed: 1 September 2020).
- KPMG, 2020b. South Korea- Measures in response to COVID-19. Available at: <https://home.kpmg/xx/en/home/insights/2020/04/south-korea-government-and-institution-measures-in-response-to-covid.html> (Accessed: 1 September 2020).
- Mori, H., et al., 2020. Implications of COVID-19 for the Environment and Sustainability. Institute for Global Environmental Strategies, Hayama. Available at: <https://www.iges.or.jp/en/pub/covid19-e/en> (Accessed: 27 July 2020).
- UN Women, 2020. COVID-19 and ending violence against women and girls. Available at: <https://www.unwomen.org/-/media/headquarters/attachments/sections/library/publications/2020/issue-brief-covid-19-and-ending-violence-against-women-and-girls-en.pdf?la=en&vs=5006>.
- UNCTAD, 2020. Global trade impact of the coronavirus (COVID-19) epidemic, Trade and Development Report Update. Available at: <https://unctad.org/en/PublicationsLibrary/ditcinf2020d1.pdf?user=1653>.
- UNDP, 2020. Putting the UN Framework for Socio-Economic Response to COVID-19 into Action: Insights, Brief 2. Available at: <https://www.undp.org/content/undp/en/home/coronavirus/socio-economic-impact-of-covid-19.html>.
- UNEP, 2016. Frontiers 2016: Emerging issues of environmental concern. Nairobi. Available at: <https://www.unenvironment.org/resources/frontiers-2016-emerging-issues-environmental-concern> (Accessed: 23 September 2020).
- UNESCO, 2020. Education: From disruption to recovery. Available at: <https://en.unesco.org/covid19/educationresponse> (Accessed: 11 September 2020).
- UNFPA, 2020. Covid-19: A Gender Lens. Protecting sexual and reproductive health and rights, and promoting gender equality. New York. March 2020. Available at: https://www.unfpa.org/sites/default/files/resource-pdf/COVID-19_A_Gender_Lens_Guidance_Note.pdf
- United Nations, 2020a. COVID-19 and the Need for Action on Mental Health. Available at: <https://unsdg.un.org/resources/policy-brief-covid-19-and-need-action-mental-health> (Accessed: 11 September 2020).

- United Nations, 2020b. COVID-19 in an Urban World. United Nations Available at: <https://unsdg.un.org/resources/policy-brief-covid-19-urban-world#:~:text=With an estimated 90 per,the spread of the virus.>
- United Nations, 2020c. Financing for Sustainable Development Report 2020. New York. Available at: <https://developmentfinance.un.org/fsdr2020> (Accessed: 11 September 2020).
- United Nations, 2020d. No Poverty : Why It Matters. United Nations. Available at: https://www.un.org/sustainabledevelopment/wp-content/uploads/2016/08/1_Why-It-Matters-2020.pdf.
- United Nations, 2020e. Shared Responsibility, Global Solidarity: Responding To the Socio-Economic Impacts of Covid-19. United Nations. Available at: https://www.un.org/sites/un2.un.org/files/sg_report_socio-economic_impact_of_covid19.pdf.
- United Nations, 2020f. The Impact of COVID-19 on Women. United Nations. Available at: https://www.un.org/sites/un2.un.org/files/policy_brief_on_covid_impact_on_women_9_apr_2020_updated.pdf.
- United Nations, 2020h. World Economic Situation and Prospects 2020. New York. Available at: https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/WESP2020_FullReport.pdf.
- United Nations, 2020i. World Economic Situation and Prospects as of mid-2020. Available at: https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/WESP2020_MYU_Report.pdf.
- United Nations, 2020g. The Sustainable Development Goals Report 2020. United Nations. <https://unstats.un.org/sdgs/report/2020/The-Sustainable-Development-Goals-Report-2020.pdf>.
- UNSD, 2019. Global SDG Indicators Database. Available at: <https://unstats.un.org/sdgs/indicators/database/> (Accessed: 30 June 2019).
- WHO, 2020a. COVID-19 Strategy Update. World Health Organization, Geneva, pp. 18. Available at: https://www.who.int/docs/default-source/coronaviruse/covid-strategy-update-14april2020.pdf?sfvrsn=29da3ba0_19.
- WHO (no date). WHO Homepage on Coronavirus disease (COVID-19). Available at: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019> (Accessed: 3 July 2020).
- WHO and UNICEF, 2020a. Hygiene Baselines pre-COVID-19: Global Snapshot. Available at: <https://www.washdata.org/sites/default/files/documents/reports/2020-05/JMP-2020-COVID-global-hygiene-snapshot.pdf>.
- WHO and UNICEF, 2020b. Water, sanitation, hygiene, and waste management for SARS-CoV-2, the virus that causes COVID-19, 11. Available at: <https://www.who.int/publications/i/item/water-sanitation-hygiene-and-waste-management-for-the-covid-19-virus-interim-guidance>.
- World Bank, 2019. World Development Indicators. Available at: <http://datatopics.worldbank.org/world-development-indicators> (Accessed: 30 June 2019).
- World Bank, 2020. Global Economic Prospects. Pandemic, Recession: The Global Economy in Crisis. June 2020. Available at: <https://www.worldbank.org/en/publication/global-economic-prospects>.
- WTO, 2020. Press Releases - Trade set to plunge as COVID-19 pandemic upends global economy - Press/855. Available at: https://www.wto.org/english/news_e/pres20_e/pr855_e.htm (Accessed: 3 July 2020).
- Zhou, X., Moinuddin, M., 2017. Sustainable Development Goals Interlinkages and Network Analysis: A practical tool for SDG integration and policy coherence. Institute for Global Environmental Strategies (IGES), Hayama.
- Zhou, X., Moinuddin, M., Li, Y., 2019. SDG Interlinkages Analysis & Visualisation Tool (V3.0). Institute for Global Environmental Strategies (IGES), Hayama. Available at: <https://sdginterlinkages.iges.jp>.