

Inclusive Subregional Cooperation in East and North-East Asia for Sustainable Development



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Preface

This report highlights the current state of subregional cooperation and key agenda that will help accelerate the achievement of the Sustainable Development Goals in East and North-East Asia. Despite the subregion's economic dynamism, and many countries in the subregion leading the world in frontier technologies, the subregion has been lagging in making progress on many of the Sustainable Development Goals. Common challenges in the subregion exist in all dimensions of sustainable development including air and marine pollution, increased exposure to natural disasters in connection to climate change, rapid population ageing, and growing inequality, just to name some of the most pressing issues.

In addressing these common challenges, the subregion has an urgent need to develop joint strategies and actions. Unlike other subregions in Asia and the Pacific, the East and North-East Asia subregion has not been able to capitalize on institutionalized regional cooperation mechanisms for multiple reasons. As such, functional and mainly bilateral cooperation in specific areas have been established in place of a multilateral entity covering multi-sectoral issues. While sectoral cooperation mechanisms have been effective in solving technical issues in a particular field, the complex and intertwined nature of today's challenges require the subregion to rethink traditional cooperation mechanisms.

At this time, when countries in the subregion are experiencing unprecedented socio-economic challenges from the COVID-19 pandemic, there is concern that countries will retreat to inward-looking strategies and protectionism in line with border closures and disruptions in regional supply chains.

This report explores opportunities to tackle some of the hurdles impeding subregional cooperation by targeting low-hanging fruits and utilizing existing structures to promote broader, deeper and stronger subregional cooperation.

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¹ Including Russian Federation

1 Introduction

The East and North-East Asia subregion¹ includes dramatic diversity: the world's largest states by landmass and by population are represented. High-tech market economies, command economies and resource driven economies are also present in the subregion. Wealth, poverty, ethnic homogeneity and diversity all co-mingle in the countries of East and North-East Asia. Political and geopolitical outlooks and priorities are vastly different. Due to these diverse approaches of development and complex relationships between the countries of this subregion, East and North-East Asia has not been able to capitalize on institutionalized regional cooperation mechanisms, unlike in other subregions in Asia and the Pacific. As such, functional and mainly bilateral cooperation in specific areas have been established in place of a multilateral entity covering multi-sectoral issues. While sectoral cooperation mechanisms have been effective in solving technical issues in a particular field, the growing interdependence and spill-over effects among different sectors call for a new approach to address common challenges in the subregion.

At this time, when countries in the subregion are experiencing unprecedented socio-economic challenges from the COVID-19 pandemic, there is concern that countries will retreat to inward-looking strategies and protectionism. Already, national responses to COVID-19 have been undertaken largely in isolation from each other, as well as borders closed to varying extents, with differences in legal and political systems governing the decision-making process even on such emergency responses. However, there is also growing recognition that a better outcome could be achieved with neighboring countries working together when faced with a crisis like COVID-19. Similarly, common subregional challenges to achieving sustainable development including climate change, air pollution, and health and well-being can be tackled more effectively through subregional cooperation.

This report provides analysis on the current state of subregional cooperation and seeks to bring forth new thinking and approaches on subregional socio-economic and environmental cooperation and integration considering the impact of COVID-19 and prevailing discourses about protectionism as well as challenges to multilateralism. It covers a wide range of topics, including connectivity in energy, trade and transportation, environmental degradation and climate change, as well as resilience through disaster

¹ For this report, the East and North-East Asia subregion consists of China, Democratic People's Republic of Korea, Japan, Mongolia, Republic of Korea and Russian Federation

risk reduction and public health. The highlighted sectors are where accelerated progress is required to achieve the 2030 Agenda for Sustainable Development in the subregion and would benefit from broad-based and inclusive subregional cooperation and integration. In all these sectors, there are gaps that need to be addressed, but there are also elements of cooperation that the member States in the subregion can build upon. The report explores the steps necessary to realize and improve subregional responses to subregional issues.

Connectivity in energy and transportation are large issues that illustrate how attempts at cooperation and integration have been made, but whose full potential is yet to be realized. On energy, for example, several studies have detailed the technical and economic feasibility of integrating subregional power systems, while also highlighting the social and environmental benefits of such a project. Political commitment to this, however, has been ambivalent, and the types of regional institutions needed to manage not only the technical, but also the economic and social aspects of integration do not yet exist. Discussions about energy connectivity have also too often been bilateral, trilateral or in some other ways limited in scope.

On transportation, broad-based and inclusive proposals such as the “East Asia Railway Community Initiative” led by the Republic of Korea largely remains at the discussion phase. While domestic transport connectivity is generally very good in the subregion, challenges remain in both the inter-country physical infrastructure as well as in using technology to enhance operational connectivity, which has vital linkages with trade facilitation. The politics of the Korean peninsula underpin the missing infrastructure links between the Democratic People’s Republic of Korea and the Republic of Korea, which impacts not only the peninsula, but also Japan and the other countries of the subregion.

Efforts on environmental cooperation is another area that demonstrates the ambivalence between potential and limitations of subregional cooperation. For example, the North-East Asian Subregional Programme for Environmental Cooperation (NEASPEC) has conducted valuable projects since its establishment in 1993 and the Tripartite Environment Ministers Meeting among Japan, the Republic of Korea and China (TEMM) convenes high-level talks on environmental matters. However, the former is limited in power to push for policy outcomes, and the latter is a subset of the subregion. As civil society has become increasingly active in the subregion, there are many examples of NGOs that operate across national boundaries in pursuit of environmental goals. There is, of course, room for greater financial and political commitment to these entities.

Most mechanisms related to climate are not configured to result in joint policies. Rather, they are research or advisory in nature. Thus, subregional environmental cooperation will require scaling up the commitments of member governments and stakeholders by providing more technical, institutional and financial support to climate-related institutions.

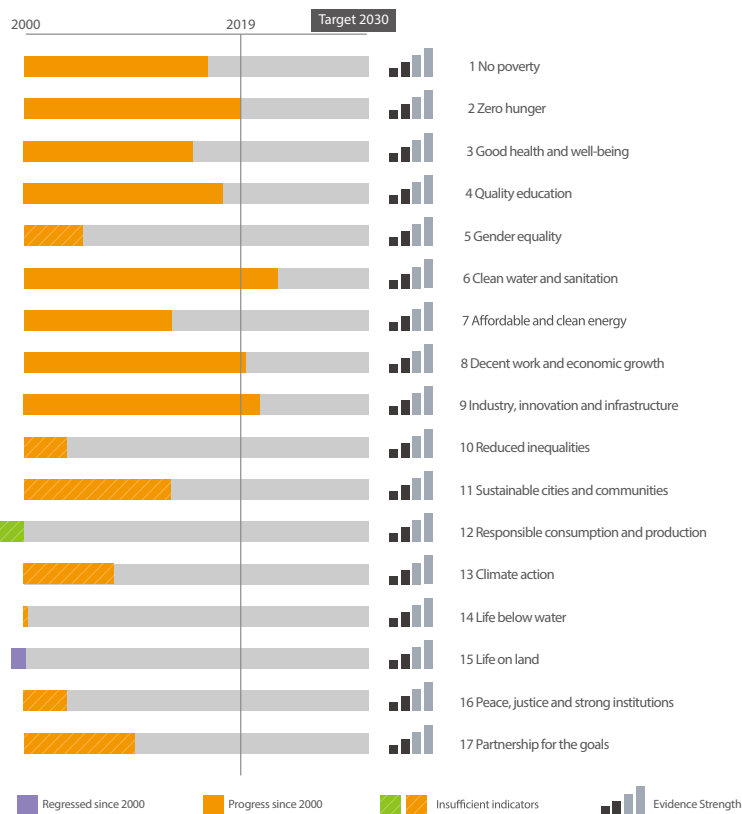
Furthermore, the subregion is one the most disaster-prone parts of the world. Large areas are on tectonically active land masses, exposing populations to risks from earthquakes and tsunamis. Typhoons and storms affect some areas, while sandstorms and drought affect others. In a largely urbanized subregion, making cities resilient to protect human life, sustain livelihoods and drive economic growth is crucial. Efforts to harmonize and tackle responses to this issue at a subregional level have been minimal, though a cooperative focus on innovations and partnerships could prove mutually beneficial.

Public health is impacted by the aforementioned issues and others, in particular the challenges that come with rapidly ageing societies. Here one also finds opportunities for cooperation and for sharing best practices, even if subregional resource-sharing or infrastructure is not imminent. Mechanisms such as the Korea-Japan-China Science and Technology Ministerial Meeting as well as the 2019 International Meeting on Technology for Ageing in East and North-East Asia organized by ESCAP are good starting points for subregional cooperation. Finally, the COVID-19 pandemic has highlighted the need for resilient and inclusive approaches to managing disease, particularly those that easily cross borders. This need is particularly acute in this logistically integrated, high urbanized and ageing subregion.

How should the countries of East and North-East Asia best tackle challenges and opportunities that are by their nature international? How can subregional cooperation increase prosperity for all member States, while also engaging not only governments, but other major stakeholders into the cooperation processes? How can subregional approaches help implement sustainable development goals? Finally, how should stakeholders deal with the subregion's lack of horizontal linkages between sectors?

Some of these challenges facing the member States can only be addressed cooperatively and some solutions can only be effective if they are part of a broad-based and inclusive approach. This is especially true if the subregion is to achieve the 2030 Agenda for Sustainable Development across all countries in the East and North-East Asia subregion, where progress on many goals have been very slow (Figure 1).

Figure 1. Snapshot of SDG progress in East and North-East Asia³



Source: ESCAP Statistics Division 2020

Broad-based and inclusive subregional cooperation and integration bundles a number of concepts together. Cooperation describes joint activities carried out by at least two parties who are mutually obligated to achieve certain goals. Prefixing “broad-based” and “inclusive” refers to aspirations for participation by not only the governments of all six member states of the East and North-East Asia subregion, but also civil society, the private sector and multilateral institutions.

Addressing shared challenges in these terms is necessary for several reasons. First and foremost, such an approach adds resiliency to the solutions found by increasing the range of stakeholders in any particular solution. If a particular constituency or interested party changes course, others will be invested in the policies at hand to carry them forward. Secondly, many of these issues intersect or are deeply

² Including Russian Federation

intertwined with one another. Solutions in any single category of cooperation impact the viability and sustainability of policies being sought to address issues in other categories. There is in a very real sense no way to disaggregate these issues. Finally, legitimacy is conferred by such an approach. Inclusion of a breadth of inputs into policy formulation and execution aids popular acceptance and support by the public who are impacted by said policies.

In this context, subregional cooperation necessarily includes state-led approaches to developmental or other goals, but it may also mean supporting and incentivizing financial assets, application of expertise and other inputs to create "win-wins" for all parties involved. Programmes and projects that support sustainable economic development, safety and well-being by focusing on transportation, environmental health, and energy are crucial, particularly when the challenges facing the member-states and their citizens are regional in nature.

A lack of linkages between sectors and institutional support for such linkages should be addressed. Governments must explicitly target horizontal linkages, creating frameworks and fora for them to develop. Those institutions may not be all-encompassing at first, but could increasingly encourage strong linkages to other sets of issues. For example, the North-East Asia Regional Power Interconnection and Cooperation (NEARPIC) Forum is an important vehicle for addressing energy connectivity that includes participation from businesses, governments and civil society. It could, however, expand to also address how energy policies contribute to air pollution or climate change, explicitly connecting solutions to both sets of issues.

Overall, more well-functioning and politically empowered institutions are necessary. The creation or expansion of subregional institutions or mechanisms to promote and enhance coordination are a necessary condition for promoting cooperation at the subregional level. In some sectors, such as transportation, these institutions may exist already, but need greater political support. In many cases, institutions exist, but are too limited in scope or do not include all member states in the subregion. In other cases, no institutions exist at all: this is the case facing advocates of a subregional liquified natural gas market, for example. Ultimately, a tradition of reluctance in East and North-East Asia to commit to regional institutions and preferences for ad-hoc and often bilateral arrangements will have to be addressed. These sorts of regional institutions exist in many other parts of the world, including subregions as diverse as East and North-East Asia. It is important to note that these institutions can and should be designed to support domestic priorities and regional integration without undermining national sovereignty.

2. Sustainable Connectivity

The East and North-East Asian subregion is a driver of global economic growth, but its over-reliance on fossil fuels, both as consumers and as exporters, contributes negatively to both localized pollution as well as global climate change. Concurrently, intra-subregional trade, investment and people-to-people interactions have all massively increased in recent years, though many points of friction yet exist. In both cases, solutions exist to increase connectivity in the region in such a way as to be economically advantageous to States, citizens and the subregion as a whole, while also “greening” many processes and practices.

2.1. Energy (SDGs 7, 13)

Current Situation and Needs

East and North-East Asia is the world’s economic powerhouse. In 2017, the total primary energy supply³ of the subregion accounted for about 44.6 percent, and electricity consumption was 37.5 percent of the world’s total, with major increases in China and the Republic of Korea over the decade. Overall, the subregion accounted for about 38 percent of the world’s carbon dioxide equivalent (CO₂-e) emissions in 2017. These emissions have also continued to grow due to the continued use of fossil fuels to underpin economic growth in the economies of the subregion. China, the world’s largest source of emissions, accounts for more than a quarter of the world’s total emissions.

While individual countries of the subregion have varied energy trade patterns and different energy profiles, the transition away from fossil fuels is a must to tackle both air pollution and climate change, as well as to meet the Paris Agreement goals and Sustainable Development Goals. At the same time, a large part of energy services is provided by electricity for transport electrification and heating; and stability in consumer electricity supply has increased in importance due to the proliferation of consumer digital connected devices. Such trends have been more clearly observed during the COVID-19 pandemic with

³ Total primary energy supply (TPES) refers to the sum of energy production and imports, subtracting exports and storage changes.

the rapid increase of virtual connections and working-from-home arrangements. Thus, decarbonized electricity from renewable energy sources will play a key role in reducing carbon emissions and solving climate issues.

Table 1. Key Energy Indicators of East and North-East Asia Countries

	Total Primary Energy Supply (Mtoe)		Total CO ₂ emission (Mt of CO ₂)		Electricity consumption (TWh)		Net energy imports (Mtoe)	
	2000	2017	2000	2017	2000	2017	2000	2017
China ^a	1,143	3,078	3,140	9,302	1,290	6,349	48	663
Democratic People's Republic of Korea	20	15	70	20	16	13	1	-12
Japan	518	432	1,136	1,098	1,021	985.2	429	401
Mongolia	2	5	9	19	3	7	1	-19
Republic of Korea	188	282	432	624	278	561.1	166	249
Russian Federation	621	733	1,474	1,537	762	978	-350	-664
East and North-East Asia subtotal	2,492	4,545	6,261	12,600	3,370	8,893.3	295	318
World	7,707	10,181	23,240	32,840	14,163	23,696		
East and North-East Asia (% of global)	32.3%	44.6%	26.9%	38.4%	23.8%	37.5%		

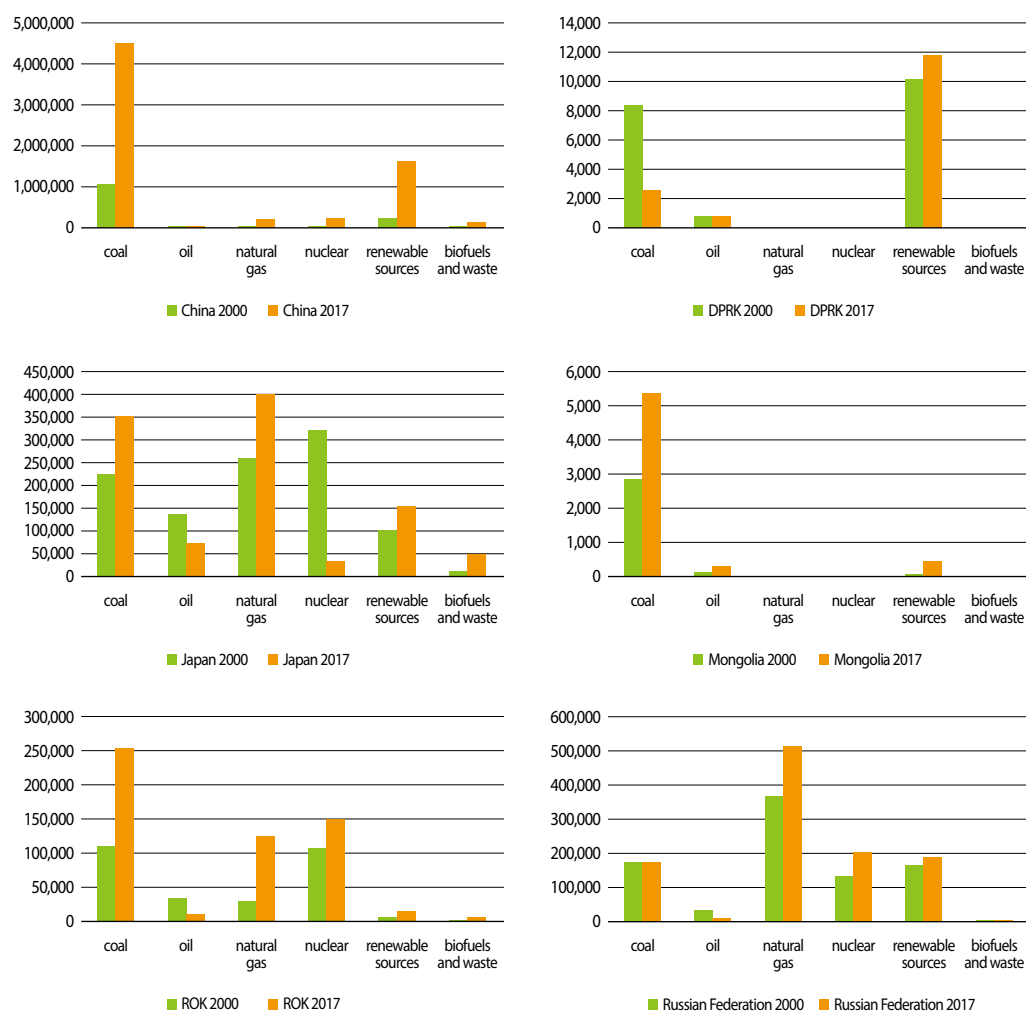
Source IEA: Data and Statistics (<https://www.iea.org/data-and-statistics>; last access in July 2020)
a/ China and Hong Kong, China

The dependency on fossil fuels for electricity generation in the subregion is still high (Figure 2), but the subregion itself has abundant renewable energy sources. For instance, the Gobi Desert of Mongolia has wind and solar power potential estimated at 1,110 TWh/year and 1,500 TWh/year, respectively; as well as the Russian Far East which has hydropower potential estimated at 1,139 TWh/year⁴. While load centers are mainly located in North China, Japan and the Republic of Korea, the abundant energy resources in Mongolia and the Russian Far East could provide neighboring resource-scarce countries with sustainable, affordable and low-carbon sources of energy and reduce the dependency on fossil fuels. However, as non-hydro renewable energies face issues of variability, large-scale development should rely

⁴ Energy Charter, et al., 2014. Gobitec and Asian Super Grid for Renewable Energies in Northeast Asia: Energy Charter Secretariat. Available at: https://www.energycharter.org/fileadmin/DocumentsMedia/Thematic/Gobitec_and_the_Asian_Supergrid_2014_en.pdf

on interconnected, long-distance and cross-border electricity networks that can effectively enable the management of this variability.

Figure 2. Electricity generation by energy source in ENEA



Source IEA: Data and Statistics (<https://www.iea.org/data-and-statistics>; last access in July 2020)

Note 1: China and Hong Kong, China

Note 2: Renewable sources include hydro, geothermal, solar PV, wind, tide and solar thermal.

Unit: GWh

Cross-border power grid interconnection and electricity trading are well developed in other regions, most notably Europe. With a very dense network of power-grid connections, cross-border electricity flows among 35 European countries in 2015 was 13.5 percent of the total generation. These flows were managed through seven interconnected electricity markets and 24 power exchanges. In addition, 12 countries have developed sufficient cross-border transmission lines to allow the export of more than 10 percent of their national installed generating capacity to neighboring countries.

Within Asia, ASEAN has also been active in promoting power grid interconnections and power trade among its member countries. The region has a long-standing goal of interconnecting power grids across the South-East Asia subregion through the “ASEAN Power Grid” and, in 2010, the ASEAN Member States adopted a “Master Plan on ASEAN Connectivity” to connect ASEAN through enhanced physical infrastructure development, effective institutions, mechanisms and processes.

Global interest in power interconnection continues to expand as it can exploit the potential complementary nature of currently misaligned energy resource endowment and demand among neighboring countries. Against this backdrop, there have been a number of initiatives proposed by East and North-East Asian countries to build power grid interconnections involving multiple countries since 1990s. However, such initiatives mostly stayed at the level of unilateral proposals due to different interests of countries and low demand from domestic energy systems.

In recent years, new initiatives for grid interconnections and multilateral processes in the subregion have gained momentum in line with national policies to promote clean development. The 2011 Fukushima nuclear accident increased interest in the possibility of diversifying Japan’s energy mix, including through interconnections with other countries. For example, Japan and the Russian Federation have begun discussions on building a power interconnection between Sakhalin and Hokkaido. Mongolia has become an active promoter of “Asia Super Grid”, with the goal of harnessing its vast renewable energy potential to become a major electricity exporting country in the subregion. China also has proposed a global energy interconnection based on renewables, in connection with mitigating GHG emissions and the Belt and Road Initiative. In addition to these domestic and bilateral processes, various multilateral processes have been initiated since mid-2010s.

Box 1. New Approaches and Progress Towards Power Grid Interconnection

Gobitec and Asian Super Grid⁵ : proposed by Ministry of Energy of Mongolia and the Energy Charter Secretariat, to utilize renewable energy sources in the Gobi Desert with hydropower electricity in Irkutsk by connecting all six East and North-East Asian countries. With the capacity of 100 GW renewable sources, expected total emission reduction of the subregion was 187 Gt CO₂ per year.



Northeast Asia Power System Integration (NAPSI) (Presentation at the Northeast Asia Regional Power Interconnection and Cooperation Forum 2019)

Sponsored by ADB and executed by the Mongolian Ministry of Energy for developing a strategy for Northeast Asia Power System Integration. The project produced three masterplans supported by numerous technical and economic analysis.



Notable feasibility studies: In March 2016, State Grid Corporation of China (SGCC), Korea Electric Power Corporation (KEPCO), Rosseti of the Russian Federation and SoftBank Group of Japan signed a memorandum of agreement (MOU) to conduct joint feasibility studies on multinational power grid interconnection in East and North-East Asia and business evaluation. This MOU showed the general readiness of the region to move towards closer cooperation on power grid connectivity. Subsequently, SGCC, KEPCO and SoftBank Group agreed to conduct a joint pre-feasibility study on China-Japan-ROK power interconnection in June 2016. China and ROK also signed an MOU to establish a cooperation channel in the energy sector, and have been conducting a feasibility study to develop China-Republic of Korea power interconnection since December 2017. The Republic of Korea-Russian Federation Summit in June 2018 recognized the importance of Democratic People's Republic of Korea's participation to the subregional grid interconnection, and signed MOU for joint study on power interconnection between Democratic People's Republic of Korea, Republic of Korea and the Russian Federation.

5 Ibid.

Several studies have confirmed the technical and economic feasibility of integrating the power systems among East and North-East Asian countries into a regional grid interconnection. For example, it has been demonstrated that there would be an average price reduction on electricity in an integrated power system, compared to isolated national power markets, though the benefits might not be evenly distributed across the countries.⁶ Despite potential social (e.g. new job creation) and environmental benefits, these interconnection initiatives have been hampered by factors such as a lack of common understanding as to the technical, legal and institutional requirements for grid integration, as well as political complexities of the subregion. A lack of multilateral platforms to support and build consensus for integration efforts is also a barrier, as cross-border power interconnection needs multidisciplinary consideration such as technical, economic, social, legal, business, political and administrative aspects.

Opportunities for Subregional Cooperation

Support for connecting power grids across the subregion has been increasing (Box 2), including a call from the President of Mongolia to establish a multilateral platform for power interconnection. A number of ongoing initiatives could potentially serve as the basis for more active collaboration on connectivity.

Box 2. Political Backing for Power Connectivity in the Subregion

China. “China will propose discussion on establishing a Global Energy Interconnection to facilitate efforts to meet the global power demand with clean and green alternatives.” (*President Xi Jinping at the UN Development Summit in 2015*)

Russian Federation. “We support the initiative of Russian, Japanese, South Korean and Chinese companies to create a super energy ring linking our countries as one. We propose setting up an intergovernmental working group in order to move ahead more rapidly and dynamically on this project. Let me note that Russia is ready to offer its Asia-Pacific region partners competitive energy rates and long-term fixed price contracts.” (*President Putin at the 2nd Eastern Economic Forum, 2016*)

⁶ Podkovalnikov et al, 2018; Podkovalnikov, 2011, Podkovalnikov 2002, Rafique et al, 2018; Otsuki, 2015; Bogdanov and Breyer, 2016; Chung and Kim, 2007, 452-53.

Republic of Korea. “Cooperation on power generation can help solve the global issue of energy transition.” (...) “If Russia’s Energy Super Ring Initiative is combined with the utilization of wind power in the Gobi Desert in Mongolia and solar photovoltaic power as part of a gigantic supergrid, Northeast Asia can form the world’s biggest energy community.” (...) “I would like to propose that all the leaders in Northeast Asia start consultations to establish an energy supergrid in the region with the great vision of the prospective Northeast Asian economic community and a multilateral security framework.” (*President Moon Jae-In at the 3rd Eastern Economic Forum, 2017*)

Mongolia. “I called upon the urgent and prompt commencement of the “North East Asian Super Grid” project which can share the load during the peak hours and will be a resource-efficient and optimal solution for supplying Northeast Asian countries with energy.” (...) “It is therefore necessary to establish an organization with appropriate involvement of Mongolia, Russia, China, Japan, South and North Korea, six countries that share responsibilities to successfully implement the “North East Asian Super Grid” project.” (*President Khaltmaagiin Battulga at the 4th Eastern Economic Forum, 2018*)

In 2016, the China Electricity Council (CEC), Global Energy Interconnection Development and Cooperation Organization (GEIDCO) and other stakeholders initiated a process to launch a platform called the North-East Asia Regional Power Interconnection, with the aim of coordinating regional power development and operations, and promoting renewable energy development and integration. The initiative evolved into an annual discussion platform named the “North-East Asia Regional Power Interconnection and Cooperation (NEARPIC) Forum”, adopting its Terms of Reference and organizing its Steering Committee in 2018. The NEARPIC Steering Committee is attended by government-affiliated organizations, research institutes, businesses and international organizations.

In 2017, the Asian Development Bank (ADB), at the request of the Ministry of Energy of Mongolia, launched the Strategy for Northeast Asia Power System Interconnection (NAPSI) project.⁷ The overarching goal is to develop a strategy and road map for utilizing Mongolia’s vast renewable energy sources in a subregional power grid. It includes three masterplans to be implemented until 2036, including electricity market analysis, a study of wind and solar potential in Mongolia, and transmission grid development

⁷ For more details on NAPSI project, <https://www.adb.org/projects/48030-001/main>

towards subregional interconnection. The study of the first phase advised the establishment of an Interim Secretariat to facilitate discussions and ensure a multilateral spirit of power grid interconnection among governments and stakeholders in East and North-East Asia as well as international organizations. In this regard, ADB proposed to ESCAP, which serves as the Secretariat of NEARPIC, to jointly establish an interim secretariat as a coordinating, supervisory body.⁸

At the regional level in Asia and the Pacific, the importance of energy connectivity and the potential contribution of cross-border energy trade to attaining SDG7 was recognized by the Ministerial Declaration⁹ of the Second Asian and Pacific Energy Forum (April 2018), which was subsequently endorsed at the 74th Commission Session of ESCAP (May 2018) by resolution 74/9.¹⁰ The declaration emphasized the necessity of facilitating the development and implementation of regional energy connectivity and trade, and established the Expert Working Group on Energy Connectivity to support regional demand. ESCAP also developed a draft Electricity Connectivity Roadmap for Asia and the Pacific which presents nine strategies to advance interconnection in an economic and sustainable manner.¹¹ These strategies can be applied in a subregional context as well, supporting power interconnection in East and North-East Asia.

Post COVID-19 recovery strategies to build back better would facilitate the transition to carbon neutral economies, by encouraging countries to maximize the utilization of renewable energy potential for transformative change in climate change mitigation. While demand for coal, natural gas and oil plummeted as a result of sharply reduced power demand due to the impact of the COVID-19 pandemic, the share of renewable energy sources increased.¹² Although the amount of new solar PV systems installed globally in 2020 is expected to be smaller than in 2019, it is thought that the trend will be short-term.

⁸ North-East Asia Regional Power Interconnection and Cooperation Forum 2019. Presented by the Asian Development Bank. Available at: <https://www.unescap.org/sites/default/files/Session%20202.%20NAPSI.pdf>

⁹ United Nations Economic and Social Commission for Asia and the Pacific (2018). ESCAP/74/27/Add.1. Available at: https://www.unescap.org/sites/default/files/ESCAP_74_28_Add1_Ministerial%20Declaration.pdf

¹⁰ United Nations Economic and Social Commission for Asia and the Pacific (2018). ESCAP/RES/74/9. Available at: https://www.unescap.org/commission/74/document/E74_RES9E.pdf

¹¹ United Nations Economic and Social Commission for Asia and the Pacific (2019). Electricity Connectivity Roadmap for Asia and the Pacific: Strategies towards interconnecting the region's grids. Available at: <https://www.unescap.org/publications/electricity-connectivity-roadmap-asia-and-pacific-strategies-towards-interconnecting>

¹² International Energy Agency (2020). Global Energy Review 2020. Available at: <https://www.iea.org/reports/global-energy-review-2020#>

2.2. Trade and Transport Connectivity (SDGs 1, 8, 9)

Current Situation and Needs

Transport connectivity in East and North-East Asia fares better compared to other subregions in Asia and the Pacific (Table 2). The subregion is home to top performing countries having well connected transport system across all major modes (i.e. air, roads, rail and maritime). The quality of these linkages is also high. On road infrastructure, for instance, majority of economies in East and North-East Asia have Primary and Class-I level roads along their national segments of the Asian Highway (AH).

Table 2. Transport Connectivity in East and North-East Asia: Key Indicators

	Connectivity: Quantity and Quality		Connectivity: Operational		
	Transport Connectivity Index (2019) ^a	AH Roads: Primary and Class I, % of total (2019) ^b	Logistics Performance Score and Rank (2018) ^c		Trade Facilitation Measures Implementation, % (2019) ^d
ENEA	107	60	3.8	...	79.3
China	170	...	3.61	26	82.8
Japan	163	...	4.03	5	93.5
Mongolia	6	...	2.37	130	46.2
Rep of Korea	105	...	3.61	25	94.6
Russian Federation	89	...	2.76	75	81.7
<i>Memo Items: ESCAP Asia-Pacific Regional Groupings</i>					
<i>South-East</i>	58	37	2.7		70.3
<i>South & South-West</i>	63	43; 50	2.7		55.4
<i>North & Central</i>	12	13	2.5		65.6
<i>Pacific</i>	34	...	2.4		35.5

a/ A multimodal transport indicator of how well each transport mode is connected in each country, based on five components: air, roads, rail, maritime and logistics. (ESCAP, 2019. *Review of Sustainable Transport Connectivity in Asia and the Pacific: Addressing the Challenges for Freight Transport 2019*)

b/ ESCAP, Asian Highway Database (<https://www.unescap.org/our-work/transport/asian-highway/database>)

c/ World Bank (<https://lpi.worldbank.org/>)

d/ UN Global Survey on Digital and Sustainable Trade Facilitation (<https://untfsurvey.org/>)

The well-connected transport landscapes of the subregional economy has likewise positively influenced performance on operational connectivity, reducing transaction costs (i.e. both financial and time duration). In East and North-East Asia, well-connected economies have ranked high in logistics performance assessments, with Japan ranked 5th globally in World Bank's Logistics Performance Index 2018 survey. With trade activities relying heavily on physical infrastructure for movements of goods, there is seemingly broad positive correlation between transport connectivity and trade facilitation in the case of North-East Asian economies. Countries with high transport connectivity scores/rankings also have high implementation rate of trade facilitation initiatives.

However, while the subregion collectively registers good performance on transport connectivity, a closer look at individual country performances reveals wide disparities.

Mongolia, a landlocked developing country, is furthest away from the top performers (i.e. Singapore, China and Japan) among selected Asia-Pacific countries according to ESCAP's transport connectivity assessment (ESCAP, 2019). As a result, constraints on its physical infrastructure have curbed the country's performance on operational connectivity. Mongolia ranked 130th (out of 160 countries) in the World Bank's Logistics Performance Index 2018 survey, where quality of transport infrastructure is assessed as one of the six core components. In the case of the Democratic People's Republic of Korea, information gaps inhibit a robust assessment on the status of the country's transport connectivity. Box 3 provides some details on the Democratic People's Republic of Korea transport system.

Box 3: Transport System of Democratic People's Republic of Korea

Rail. Railways are the dominant transport mode for both freight (91%) and passengers (75%). The country operates a rail network of 5,300 route-km with standard 1,435 mm gauge configuration, mostly single-track lines (98%). There is a single-track dual gauge section (1,435/1,520 mm) from Rajin Port to Tumangang (border with the Russian Federation). The electrification rate is almost 80%.

Road. Roads play a marginal role in the overall transport system and are mainly used for short-distance movements (i.e. mainly to deliver passengers and goods to/from railway stations). The ratio of paved roads to non-paved is significantly low: paved roads make up less than 10% of the total road network. The country has limited highways, the majority of which link Pyongyang to other cities over relatively short distances: Wonsan (189 km), Kaesong (170 km), Huichon (120 km), Mount Kumgang (114 km) and Namp'o (44 km).

Port. The **Democratic People's Republic of Korea** has eight commercial ports but only two ports have container-handling capabilities (Namp'o on the west coast and Rajin on the east coast).

Cross-border. Links to the Democratic People's Republic of Korea from China have improved in the past decade but have seen limited usage. The Quanhe-Wonjong Bridge was expanded and renovated from 2015 to 2017. This links the Rason Special Economic zone to the Hunchun, China—Zarubino, Russia sub-Corridor and is also the start point for the Korean Peninsula East Corridor. China also unilaterally funded a new bridge linking Dandong, China to Sinuiju, Democratic People's Republic of Korea. Started in 2011 and completed in 2014, this is the start point for the Korean Peninsula West Corridor. As of 2020, the bridge has yet to be used.

The main transport connections between Democratic People's Republic of Korea and its neighbors are complemented by special economic zones, most of which are located near the AH1 and AH6 routes.

Source: ESCAP, 2017. *The Establishment of the Integrated Logistics System in the Region Connecting to the Korean Peninsula* (https://www.unescap.org/sites/default/files/Korean%20Peninsula%20Report-FINAL_1.pdf)

Although developed countries in the subregion perform well individually on transport and operational connectivity within national borders, aspects of connectivity which have cross-border attributes show less progress.

For instance, road completion work in some border crossing points requires attention, both in terms of addressing infrastructure gaps and upgrading road quality.¹³ In addition, needless to say (as with broader political and economic issues), missing infrastructure links between Democratic People's Republic of Korea and Republic of Korea continue to be a challenge not only for seamless connectivity in the Korean Peninsula but also connections with neighboring countries.

¹³ The road network along the AH4 route connecting China, Mongolia and the Russian Federation includes the following points: Novosibirsk–Barnaul–Gorno-Altaysk–Tashanta(Russian Federation)/Ulaanbaishint(Mongolia)–Hovd–Yarantai(Mongolia)/Takeshikan(China)–Urumqui–Kashi–Honqaf(China's border with Pakistan). About 25.8 km of road construction on the Mongolian segment of the Tashanta(RUS)–Ulaanbaishint(MNG) border route has just been completed in early 2020.

On maritime connectivity, cooperation in the subregion has somewhat progressed, at least, in terms of operational connectivity through interfacing of ports.¹⁴ By August 2019, information interconnection of vessels at 26 ports and containers at 16 ports has been achieved across China, Japan and Republic of Korea. Achievements notwithstanding, there are emerging potentials of new markets and other economically viable transport corridors elsewhere in the subregion. These developments merit broadening cooperation beyond the customary trilateral partnership, for instance, to include other ports in the Greater Tumen Region.

The gaps in cross-border transport linkages also manifest in transport facilitation, most acutely in the area of transit. Notably, as data from the 2019 UN Global Survey on Digital and Sustainable Trade Facilitation show, the weaknesses are less on technical procedures or business processes but more on institutional support and coordination. For example, initiatives on transit facilitation agreements or cooperation between agencies of countries involved in transit have only been partially implemented even by the top performing countries in East and North-East Asia.

Broad-based and Inclusive Approach

While existing transport-related cooperation mechanisms have facilitated seamless connectivity in the subregion, further work is needed particularly in the context of adopting new approaches that are more inclusive and applied across several dimensions.

First, gaps in infrastructure, both its physical and non-physical (“soft”) dimensions, are most acute for the developing economies in East and North-East Asia (i.e. Mongolia and Democratic People’s Republic of Korea). Hence, seeking the active participation and engagement of these developing countries becomes paramount. That is necessary if the subregion is to really achieve seamless connectivity aligned with the sustainable development precepts of “leaving no one behind” towards shared prosperity.

¹⁴ The Northeast Asia Logistics Information Service Network (NEAL-NET) was established in 2010 at the 3rd China-Japan-Republic of Korea Ministerial Conference on Transport and Logistics as a joint project by the three countries. It aims to promote transport connectivity and supply chain management by visualizing and sharing real-time container logistics information among parties concerned, including consigners, forwarders and carriers. NEAL-NET is jointly administered by officially assigned entities: LOGINK (China), COLINS (Japan) and SP-IDC (Republic of Korea). Aside from ports, NEAL-NET encompasses a wide range of stakeholders (e.g. logistics service providers, transporters across modes, government agencies, etc).

Second, the ever-changing global economic landscape in recent years saw a rise in trade barriers imposed by key export markets. Therefore, it benefits the subregion to build its “local” resilience by nurturing new markets and growth drivers from within. To do so entails expanding cooperation beyond long-established partnerships to include other economies in the subregion where potentials for growth remain largely untapped.

Third, achieving seamless connectivity is a multi-faceted endeavor, with issues not solely under the purview of the transport sector. This is particularly evident in the context of operational connectivity issues related to transport facilitation at border crossing points. For this reason, a more broad-based engagement of sectors with linkages is needed.

Opportunities for Seamless Transport Connectivity

The following section highlights some opportunities where an inclusive approach can be adopted in tackling the challenges and needs on transport connectivity in East and North-East Asia.

A number of these challenges are “technical” in nature. These include, among others, recognition and harmonization of standards (e.g. rail gauges, sanitary and phytosanitary procedures and inspection processes at border crossing points), exchange of cross-border transport data/information (e.g. consignment notes), and financing and management of cross-border infrastructure projects. A more inclusive cooperation on these technical issues involving developing economies like Mongolia and Democratic People’s Republic of Korea should be pursued, given the gaps are most present and needs most acute in these countries.

These types of cooperation would likely be project-based and could build on the work of existing mechanisms. Being home to economies at the frontier of technological advances, the subregion could leverage from this strength by utilizing technology to address these technical issues. Box 4 broadly characterizes some possible applications.

Box 4: Inclusive Cooperation in Transport Connectivity: Use of Technology

The Global Innovation Index assesses the innovation performance of 129 countries.¹⁵ In 2019, three North-East Asian economies figured in the high ranks: Republic of Korea (11th); China (14th) and Japan (15th). Russian Federation and Mongolia clustered in the mid-range, with 46th and 53rd ranking, respectively. Countries have already utilized technology in advancing transport connectivity within their borders. The next step is optimizing its use through further application on cross-border initiatives.

Logistics Information Exchange. NEAL-NET currently involves information exchanges among ports in China, Japan and Republic of Korea. Inclusive cooperation in the subregion may be enhanced through broadening country participation on logistics information exchange between NEAL-NET and other ports in the Great Tumen region. For instance, it has been indicated that Vladivostok and Vostochny ports (Russian Federation) have container management system interfaces which are aligned with NEAL-NET standards.¹⁶ This lays a good starting point on the viability of the project. The changing status of the arctic adds impetus to the goal of facilitating and improving trade flows within the subregion itself. All the ports of the region are set to see growth as shipping from beyond the subregion transships and consolidates freight in Northeast Asia on the way to or from markets the other side of the Arctic ocean. Efficiency gains found now will translate into even greater efficiencies in the medium-term.

Railway. Railway networks play a dominant role for Democratic People's Republic of Korea and Mongolia. Enhancing cross-border cooperation in this transport mode would help generate economic benefits for these two countries, in line with a more inclusive growth and development in the subregion. Aside from addressing physical gaps, enhancing operational efficiency of railway networks through the use of technologies includes electronic exchange of information among railways; interconnection between the electronic systems of railways with border agencies; reducing transit formalities; unlocking the capacity of the railway lines using

¹⁵ <https://www.globalinnovationindex.org/Home>

¹⁶ https://www.unescap.org/sites/default/files/1_2.LOGINK%20InternationalCooperation20190929.pdf

better signaling and telecommunication systems.¹⁷ Countries in the subregion recognize the importance of rail to strengthen subregional integration. The Republic of Korea launched the East Asia Railway Community Initiative in August 2018.¹⁸

Sustainable Transport. Technology is a key enabler in advancing smart transport systems as well as environment-friendly and disaster-resilient transport infrastructures. East Asian countries are at the forefront of these initiatives and could serve as champions to facilitate broader cooperation in these areas. While it has less “physical integration” to the subregion because it is an island country, Japan has opportunities to enhance its linkages to its East Asian neighbors through its national initiative on maritime transport. Launched in July 2018, Port 2030 is Japan’s medium-/long-term policy on ports and shipping with eight major policies.¹⁹ Several policies like green ports and logistics (‘Carbon-free port’) and ICT for resilient ports would find strong resonance with other East Asian countries whose national initiatives are also geared towards similar objectives.

At a policy level, a recent OECD report²⁰ that looked into new approaches to address global policy challenges in 21st century argues that sectors with critical linkages should have proper institutional support and not institutional silos to ensure policy implementation that is continuous and not ad hoc, avoiding unwanted consequences (OECD, 2020). This aligns with a more broad-based engagement that is advocated for by the transport sector with other sectors with which it shares issues of common policy interests.

17 These policies and issues have been extensively discussed in the context of the development and operationalization of the Trans-Asian Railway network (<https://www.unescap.org/intergovernmental-meetings/sixth-meeting-working-group-trans-asian-railway>).

18 https://www.unescap.org/sites/default/files/1_4.EastAsiaRailwayCommunityInitiative.CKho_.pdf

19 Ports and Harbors Bureau, MLIT (<https://www.mlit.go.jp/en/kowan/index.html>). PORT 2030 (in Japanese) http://www.mlit.go.jp/report/press/port03_hh_000042.html

20 OECD, 2020. Systemic Thinking for Policy Making – The Potential of Systems Analysis for Addressing Global Policy Challenges in the 21st Century (<http://www.oecd.org/publications/systemic-thinking-for-policy-making-879c4f7a-en.htm>)

Such is the case between transport facilitation and trade facilitation, both key components of seamless connectivity. Work has advanced in parallel on these two areas involving countries in the subregion, whether at a bilateral or plurilateral basis.²¹ There exist opportunities to foster synergies between the two policy areas. But this has yet to be deliberated in an integrated manner at the policy level. To this end, existing cooperation platforms could be embedded with new mechanisms that would allow for an “institutionalized” engagement of these two sectors at the policy level, eliminating institutional silos for more effective implementation of policies. Box 5 provides example cases to illustrate how to embed these new mechanisms.

Box 5: A More Broad-based Policy Engagement: Embedding New Mechanisms

North-East Asia’s “institutional” landscape supporting subregional cooperation and integration consists of several multilateral and multifunctional organizations.²² It has been often argued that there is a need to deepen and expand various kinds of functional cooperation to help unlock the subregion’s economic development potential (ESCAP, 2017). Several of these subregional organizations have existing processes which can be used as building blocks to expand sectoral cooperation.

The expansion should be supported at the highest level of decision makers within the organization to ensure continuity. Addressing common policy issues would be a natural binding force to sustain the momentum of engagement.

Cooperation among member countries of the Greater Tumen Initiative (GTI) is in line with

²¹ Cooperation in this area is more demonstrated at a bilateral basis. At a plurilateral configuration, some examples include ESCAP-facilitated initiatives. On transport facilitation, for instance, is the enforcement of the *Intergovernmental Agreement on International Road Transport along the Asian Highway Network* involving China, Mongolia and the Russian Federation. On trade facilitation, the creation of the UNNExT Task Force on Cross-border Electronic Data Exchange: Northeast Asia, involving China, Mongolia, Republic of Korea and the Russian Federation.

²² ESCAP, 2017. Unlocking the Potential for East and North-East Asian regional Economic Cooperation and Integration (https://www.unescap.org/sites/default/files/publications/Unlocking%20the%20Potential%20for%20East%20and%20North-East%20Asian%20Regional%20Economic%20Cooperation%20and%20Integration_0.pdf).

its Strategic Action Plan covering several priority areas of cooperation.²³ During the 19th GTI Consultative Commission meeting (the highest governing body of GTI) in August 2019, there was a call to expand cooperation within the GTI cooperation platforms. This can be pursued between the two connectivity areas—transport and trade/investment—where GTI work has gained most traction compared to other priority areas.

On December 2019, Leaders of the Trilateral Summit indicated in their *Trilateral Cooperation Vision for the Next Decade*²⁴ of advancing the "Trilateral+X" cooperation, by jointly expanding cooperation with other countries to achieve common development. Cooperation areas include sustainable economy, ecological and environmental conservation, disaster risk reduction, health, poverty alleviation, and people-to-people exchange.

While the previous section elaborates on sustainable connectivity in relation to energy, trade and transport, information and communications technologies (ICT) are key elements of connectivity. This is an important work in the Asia-Pacific region, given digital divide is still acute in Asia and the Pacific despite great progress in deepening regional connectivity in ICT.

²³ Greater Tumen Initiative ([http://www.tumenprogramme.org/UploadFiles/新建文件夹%20\(3\)/GTI%20SAP%20\(2017-2020\)_20170628.pdf](http://www.tumenprogramme.org/UploadFiles/新建文件夹%20(3)/GTI%20SAP%20(2017-2020)_20170628.pdf)).

²⁴ Trilateral Cooperation Secretariat (<https://tcs-asia.org/en/cooperation/overview.php?topics=2>)
Concept Paper for Trilateral+X Cooperation (<https://www.mofa.go.jp/files/000508825.pdf>).

3. Environmental Sustainability (SDGs 13, 14, 15)

Current Situation and Needs

East and North-East Asia, a vast and diverse subregion, presents a range of environmental challenges. While China and Mongolia still face significant desertification threats, accounting for 25 and 77 percent of territories respectively, the subregion has expanded forest areas by 22.9 percent between 1990 and 2015, mostly attributable to reforestation in China. However, significant land use changes associated with economic development and demographic change have resulted in 36 percent of endemic species facing extinction risk. The extinction risk for endemic species could be as high as 59 percent if all species about which data is deficient are threatened.²⁵ Furthermore, apart from land restoration efforts, the increase of forest areas has not been driven by improving domestic consumption and production patterns but substituting domestic resources with international trade. In particular, China, Japan and the Republic of Korea accounted for 19.1 percent of the trade of global timber products and 51.8 percent of the trade of tropical timber products in 2018.²⁶ Thus, the subregion has the task of not only improving biodiversity conservation and sustainable land and forest management but also reducing its ecological footprint in forest and biodiversity outside the subregion.

Most countries have recently improved the overall management of environmental quality with increasing policy and technical interventions. Meanwhile, there exist significant challenges in meeting national air quality targets and reversing the current trend of greenhouse gases emissions. Air pollution and its transboundary effects are of another major concern in East and North-East Asia. Given that the significant health impacts of air pollutants, especially, fine particulate matter (PM_{2.5}) has been placed in the center of public and policy debates across countries in the subregion considering the large mortality rate attributed to air pollution.

²⁵ IPBES, 2018, Regional Assessment Report on Biodiversity and Ecosystem Services for Asia and the Pacific

²⁶ ITTO, Biennial Review Statistics; https://www.itto.int/biennial_review/?mode=searchdata

Table 3. Key Indicators of Subregional Environmental Challenges in East and North-East Asia

	Threatened species ^a		GHG Emissions ^b		Air Pollution	
	Total	Mammals/ birds	Trend 2010 - 2017 (%)	GHG emission per GDP, 2017 (KgCO ₂ e/\$)	Mortality rate (per 100,000 people), 2016 ^c	PM.2.5 in the Capital, 2019 (µg/m ³)
China	1,172	74/96	18.2	1.06	112.7	42.1
Democratic People's Republic of Korea	88	10/29	-17.3	4.41	207.2	n/a
Japan	470	29/50	- 1.5	0.26	11.9	11.7
Mongolia	43	11/24	75.7	4.10	155.9	62.0
Republic of Korea	136	12/33	11.0	0.47	20.5	24.8
Russian Federation	279	34/57	4.3	1.42	49.4	10.0

a/ IUCN Red List version 2020-1: Table 5 Last updated: 19 March 2020, <https://www.iucnredlist.org/resources/summary-statistics#Summary%20Tables>

b/ Source: Climate Watch (World Resources Institute), <https://www.climatewatchdata.org/ghg-emissions?source=72>

c/ Source: WHO, World Health Statistics 2019, https://www.who.int/gho/publications/world_health_statistics/2019/en/ (Age-standardized mortality rate attributed to household and ambient air pollution(per 100,000 population))

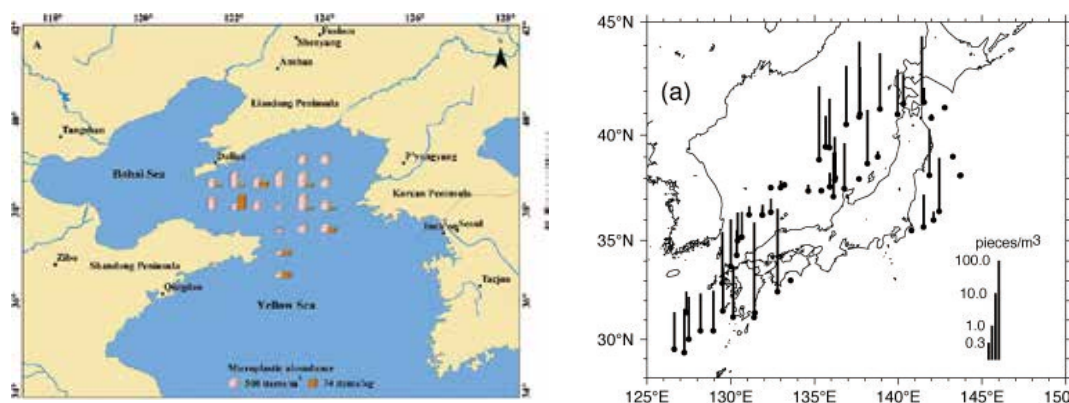
The continuing increase in energy demand and heavy reliance on fossil fuels in the subregion have resulted in a sharp increase in GHG emissions from fossil fuel combustion, which has doubled since 2000.²⁷ East and North-East Asia has increased its global share of fossil fuel GHG emissions from 25.6 percent in 2000 to 36.4 percent in 2017. Table 3 indicates the significant upward trend of GHG emissions as well as the relatively high carbon intensity of economy in most countries. This also indicates the need for decarbonization of energy systems as well as moving economic activity towards the current commitments of member countries under the Paris Agreement. Furthermore, as the current level of pledges in the nationally determined contribution (NDC) are insufficient to close the gigaton gap towards the goal of keeping the global temperature rise well below 2 °C above pre-industrial levels, East and North-East Asian countries need to increase their level of ambition and achieve deeper emission cuts in the next decade.

The subregion also intensively utilizes living marine resources. Four members of the subregion, China, Japan, Republic of Korea and the Russian Federation, share about 30 percent of the world's capture

²⁷ Asia and the Pacific SDG Progress Report 2020, ESCAP, <https://www.unescap.org/publications/asia-and-pacific-sdg-progress-report-2020>

fisheries. The former three are among the top 10 countries for aquaculture production in the world. Meanwhile, during recent years, marine plastic litter and microplastics have become a key environmental concern of the governments and public in the subregion. While plastic litter directly threatens the life of marine animals, microplastics (> 5 mm) and microplastics (< 5 mm) degraded from plastic litter cause significant harm to the marine ecosystem and potentially humans through the food chain. A modeling study²⁸ on marine litter from 192 coastal countries indicates that waste inputs from East and North-East Asian continent into surrounding oceans is the largest in the world. A study on microplastic in the seas around Japan²⁹ estimates there are about 1.7 million pieces per km², which is 16 times greater than in the North Pacific and 27 times greater than in the world's oceans (see Figure 3). A study on microplastics in the Yellow Sea³⁰ also shows the abundance of microplastics, 545 ± 282 items/m³ in surface seawater and 37.1 ± 42.7 items/kg dry weight in sediments. Despite the impacts on marine ecosystem and human health of microplastics, the small size of these pollutants makes it extremely difficult to remove them from the marine environment. The only solution is to prevent the discharge of litter into the ocean. It is also necessary to undertake a comprehensive subregional-level study on the origins, pathways, and environmental impacts of the microplastics, which are not confined to territorial waters.

Figure 3. Volume of Marine Microplastics



Source Lin Zhu, et al.; Isobe, et al.

²⁸ Jambeck, et.al. Plastic waste inputs from land into the ocean, *Science*, 13 Feb 2015: Vol. 347, Issue 6223, pp. 768-771

²⁹ Isobe, et al. East Asian seas: A hot spot of pelagic microplastics, *Marine Pollution Bulletin*, Volume 101, Issue 2, 30 December 2015, pp. 618-623

³⁰ Lin Zhu, et al.: Microplastic pollution in North Yellow Sea, China: Observations on occurrence, distribution and identification, *Science of The Total Environment*, Volume 636, 15 September 2018, pp. 20-29

Opportunities for Subregional Cooperation

Ecological interdependence based on geographical proximity is one of the first conditions that create a boundary and sense of (sub)regional community. Subregional members often face mutual vulnerabilities from mismanagement of ecological interdependence, particularly common pool resources such as the high seas and the atmosphere as well as shared environment along national borders. In this connection, mechanisms for (sub)regional environmental cooperation occupy about two-thirds of multilateral environmental agreements, and a key element of multilateralism at the (sub) regional level. Such mechanisms can support the development of subregional multilateralism and at the same time their institutional and technical strength can be an outcome of multilateralism. The East and North-East Asia subregion is behind many other subregions in the Asia-Pacific in terms of building and institutionalizing multilateralism, thereby resulting in slow progress in developing effective mechanisms for environmental cooperation.

The lack of a subregional intergovernmental body has also resulted in creating diverse mechanisms in terms of membership, programmatic areas and institutional arrangements. The secretariat arrangements of the mechanisms in table 4 indicate that most mechanisms rely on the secretariat support of third parties, UN organizations, while tripartite cooperation among China, Japan and the Republic of Korea utilize their own institutions. This represents the weakness of multilateralism in the subregion and the limited ownership of the member states. In terms of substantive role, the work of most mechanisms are still at the level of information sharing and joint research, far from developing joint policies or coordinating domestic policies. Thus, subregional environmental cooperation requires scaling up the commitments of member governments and stakeholders by providing more technical, institutional and financial support. This is key to improving efficiency and effectiveness of the existing cooperation mechanisms.

Table 4. Multilateral Environmental Cooperation Mechanisms in East and North-East Asia

Mechanisms	Members	Governance	Secretariat	Areas
NEASPEC	All 6 countries	Senior Officials Meeting	ESCAP East and North-East Asia Office	Air pollution, terrestrial and marine biodiversity, low carbon city, land degradation
TEMM	China, Japan and the Republic of Korea (CJK)	Ministers' Meeting	Host ministry of annual meeting	Air quality, 3R/circular economy, climate change, Biodiversity, chemical management, environmental education, etc.
NOWPAP	CJK, Russia	Intergovernmental Meeting	Secretariat under the auspices of UNEP with four Regional Activity Centers in member countries	Coastal management, pollution prevention, marine biodiversity
EANET	CJK, Mongolia, Russia and South-East Asia	Intergovernmental meeting	UNEP Regional Office for Asia-Pacific supported by Asia Center for Air Pollution Research (ACAP) as the Network Center for the EANET	Acid deposition: monitoring, research, capacity building
LTP	CJK	Expert meeting	ROK National Institute for Environmental Research	Modeling and monitoring of transboundary air pollution
EABRN	All six countries and Kazakhstan	Network meeting	UNESCO Beijing Office	Research and capacity building on biosphere reserve management
DLDD-NEAN	China, Mongolia, ROK	Steering committee meeting	Korea Forest Service of ROK	Subregional implementation platform for achieving land degradation neutrality target (LDN) and enhancing the implementation of UNCCD

NEASPEC: North-East Asian Subregional Programme for Environmental Cooperation

TEMM: Tripartite Environment Ministers Meeting among Japan, Korea and China

NOWPAP: Northwest Pacific Action Plan

EANET: Acid Deposition Monitoring Network in East Asia

LTP: Joint Research Project on Long-range Transboundary Air Pollutants in North. East Asia

EABRN: East Asian Biosphere Reserve Network

Meanwhile, most mechanisms have served as key platforms for nurturing and operating an “epistemic community” in each substantive area. In multilateral environmental governance, epistemic community is defined as a network of professionals that promote consensual knowledge and engage in policy development. Most mechanisms operate networks of experts from research institutions and

academia as well as practitioners. This applies not only to the mechanisms dedicated to one thematic area, but also mechanisms operating in multiple areas such as NEASPEC and TEMM. In NEASPEC, the operation of North-East Asia Clean Air Partnership, North-East Asia Low Carbon City Platform and North-East Asia Marine Protected Area Network involves the regular interactions among experts. TEMM also provides such platforms through tripartite policy dialogues on air pollution, biodiversity, chemical management and environmental education, working groups and expert seminars.

Box 6: Air Pollution: Building Science-based, Policy-oriented Cooperation

North-East Asia suffers from health impacts of air pollution, notably PM_{2.5} exceeding WHO standards. The geographical proximity and meteorological conditions of major cities in the subregion means that air pollution frequently moves beyond origin cities and countries into neighboring regions and countries. Air pollution is therefore a transboundary environmental problem. However, the subregion has been only able to create an open and comprehensive platform for dialogue and cooperation, North-East Asia Clean Air Partnership under NEASPEC in 2018. NEACAP plans to facilitate information and data exchange, coordinate with relevant mechanisms and synthesizes their results, and propose potential technical and policy measures, which will be coordinated by the Science and Policy Committee (SPC).

Joint Research Project on Long-range Transboundary Air Pollutants in North-East Asia (LTP) has recently made significant progress, agreeing on a single modeling result of transboundary movement of air pollution by publishing the Summary Report for Policymakers of the Long-Range Transboundary Air Pollution in Northeast Asia (LTP) in November 2019. Despite the long history of the modeling work under the LTP project since early 2000s, the modeling result of each country team could not be shared externally to formulate an agreed result from three modeling groups due to political sensitivity of formally quantifying transboundary impacts.

Box 7: Biodiversity: Managing Mismatch between Natural Habitats and Political Borders

A key area of subregional cooperation is biodiversity conservation, especially when there is often a mismatch between the habitats of key animals and political borders. Protecting such species requires transboundary cooperation in order to create knowledge and effective protection measures. Thus, there is great need to develop an agreement or platform for promoting connectivity conservation among habitats connected physically or ecologically by migratory or border-crossing species and facilitating communication and joint action between protected areas as well as other stakeholders including NGOs.

NEASPEC facilitated a joint study between Chinese and Russian experts on border crossing of tigers using camera traps. The study identified 19 out of 45 Amur tigers and 15 out of 89 Amur leopards crossing the border during 2013-2015. This generated new information on the patterns of cross-border movements. Based on the study, NEASPEC is carrying out a project on cooperation along the transboundary protected area.

The border areas of China, the Russian Federation and Democratic People's Republic of Korea are also important habitats for migratory birds, consisting of Khasan Nature Park in the Russian Federation, Fangchuan National Park in China and Rason Migratory Bird Reserve in Democratic People's Republic of Korea. Though there are clustered around border areas, there is no system for information exchange, joint surveying or the introduction of simultaneous, coordinated protection measures. Other organizations have also worked for greater coordination and to include the Democratic People's Republic of Korea in conservation efforts. Such groups include the Hanns Seidel Foundation, the East Asian Australasian Flyway Partnership (EAAFP), the International Union for the Conservation of Nature (IUCN), Birds Korea, WWF, Beijing Forestry University and others³¹. NEASPEC and the Hanns Seidel Foundation assisted the Democratic People's Republic of Korea in acceding to the Ramsar Convention and designating Rason Migratory Bird Reserve as a Ramsar site in 2018.

³¹ Hanns Seidel Foundation Workshop Report *Conservation and Wise Use of Wetlands in the DPR Korea* May 30, 2018. <https://korea.hss.de/en/news/detail/conservation-and-wise-use-of-wetlands-in-the-dpr-korea-news2844/>

Despite political and institutional constraints, environmental cooperation has increasingly expanded the space for joint actions of both state and non-state actors, and various technical projects for supporting capacity building of member countries have been carried out through environmental cooperation. Most recently, there has been growing awareness on the need to connect subregional and multilateral cooperation with global goals. In addition to NEASPEC which also defines its programmatic areas in the context of the Sustainable Development Goals, TEMM 21 held in 2019 agreed that Tripartite Joint Action Plan for Environmental Cooperation 2020-2024 needs to be in line with the efforts of the international community, particularly, the Sustainable Development Goals, and the Paris Agreement.

4. Innovation for Inclusive and Resilient Societies

4.1. Disaster Risk Reduction (SDGs 1, 2, 9, 11, 13, 15)

Current Situation and Needs

The East and North-East Asia subregion is one of the most disaster-exposed subregions in the world. The annualized average losses (AAL) from disasters in the subregion is highest in the Asia Pacific accounting for more than 60% of the region's total AAL, both in terms of high-severity, mild to low-frequency events (intensive risk) such as earthquakes, typhoons, river line floods and tsunamis, and low-severity, high-frequency events (extensive risk). Furthermore, annualized average losses caused by droughts is calculated to be approximately US\$225 billion, which is the highest among all disasters due to its long-lasting impact on agricultural sectors in China and Mongolia (Table 5).³²

Table 5. Disaster Risk in East and North-East Asia

Sources of Risk	AAL (US\$Billion)	Proportion of subregional GDP (percentage)
Intensive risk – Multihazard AAL	101	0.52
Extensive risk – Multihazard AAL	131	0.68
Extensive risk – Multihazard AAL including indirect losses	184	0.95
Agricultural drought AAL	225	1.16
Total	409	2.11

Source Reprinted from "The Disaster Riskcape across East and North-East Asia", ESCAP, 2019, p.3

A primary factor driving up economic loss and damages from disasters in the subregion is the level of economic development. East and North-East Asian countries have more economic stock exposed and affected by disasters than any other subregion in Asia and the Pacific. Particularly in Japan and parts of China geographically located on the Ring of Fire, there have been a number of costly events such as

³² ESCAP (2019) The Disaster Riskcape across East and North-East Asia. <https://www.unescap.org/sites/default/files/IDD-APDR-Subreport-ENEa.pdf>

earthquakes and tsunamis. Japan and China respectively account for 64 percent and 14 percent of the Asia Pacific region's total earthquake AAL and Japan represents 91 percent of the total tsunami AAL in the region.³³

With the impact of climate change, the subregion is likely to experience growing frequency and intensity of disasters. The projected rise in global temperatures by 1.5o C between 2030 and 2052 increases the probability of longer duration of heat waves, droughts and floods. Also, as shown in Figure 4, populations exposed to water scarcity and populations affected by river flooding, particularly in the Russian Federation are expected to increase drastically.³⁴

Furthermore, sand and dust storms originating from Inner Mongolia in China and the Gobi Desert in Mongolia which travel to the Korean Peninsula and Japan are also likely to increase as climate change impacts the rate of desertification and land degradation.³⁵ Over decades, Mongolia has been experiencing increases in air temperature (average air temperature on surface rose by 2.1oC from 1940 to 2007) without a rise in precipitation, leading to dryness and drought in Mongolia, and in turn resulting in more frequent sand and dust storms.³⁶ The economic, social and environmental costs of desertification and land degradation in these parts of the subregion are extensive. For example, the dust storm of May 1993 in North-Western China directly affected 12 million people and caused damages totaling an estimated US\$ 70 million.³⁷

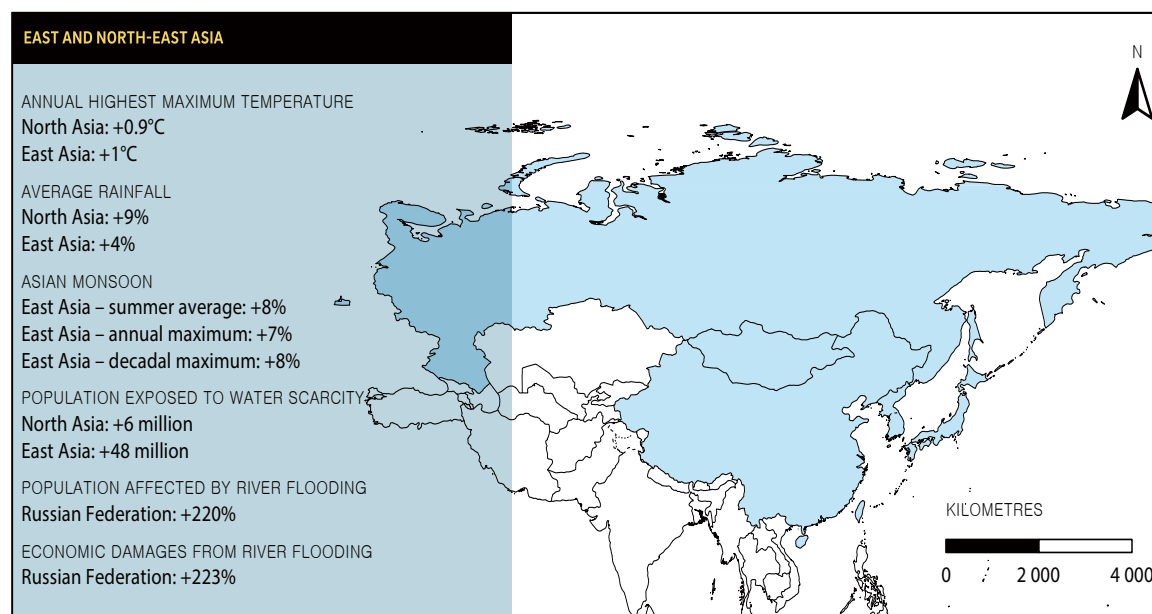
33 ibid

34 ibid

35 Jung (2016)

36 NEASPEC Working Paper (2012) Combating Desertification in North-East Asia

37 ESCA (2018) Sand and Dust Storms in Asia and the Pacific: Opportunities for Regional Cooperation and Action

Figure 4. Impact of global warming of 1.5°C in East and North-East Asia


Sources ESCAP, based on Global Assessment Report on Disaster Risk Reduction (GAR) Risk Atlas, 2015; IPCC, 2018.

Disclaimer: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.

As disasters have such a significant impact on lives and livelihoods, there are multiple SDG targets that are related to building disaster resilience. Some of the most direct targets are listed below.

Table 6. SDG Goals and Targets related to disaster resilience

SDG Goal	SDG Target
Goal 1: End poverty in all its forms everywhere	1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters
Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture	2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality

SDG Goal	SDG Target
Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	9A Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States
Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable	By 2030, significantly reduce the number of deaths and number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations
Goal 13: Take urgent action to combat climate change and its impacts	13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world

Progress on SDGs in general in the subregion has been lagging in many sectors. However, progress on goal 11 is of particular concern as the subregion showed regression in achieving the target of reducing economic losses and affected infrastructure and services from disasters. A key to making progress towards goal 11 is by investing in innovative and resilient infrastructure and technology for prevention and early warning.

Opportunities for Subregional Cooperation

It is highly crucial for the East and North-East Asia subregion to manage disaster risk, especially in view of the rapidly growing elderly population in the subregion who are particularly vulnerable to disasters, often due to limited mobility and access to information technology. While the subregional economies have managed to reduce disaster-related fatalities over the years, population ageing can negatively affect overall vulnerability levels. Also, economic growth is likely to increase exposure and subsequently lead to higher loss and damages. Given the tremendous damages that disasters cause in this region, the use of technology and sub-regional cooperation are essential to effectively respond to disasters and manage disaster risks.

Disaster risk reduction strategies are increasingly reliant on emerging technologies. Satellite imagery, crowdsourcing and social media are the fastest growing sources of disaster management. These

specific technologies are based on “big data”, mobile phone penetration, and internet access, and allow for more accurate forecasting of the potential impact of disasters and to rapid response when disasters occur.³⁸

In response to disasters such as typhoons, flood inundations and landslides, China and Japan have utilized big data to developed early-warning products. The Japan Meteorological Agency (JMA) developed potential risk indices for landslides and flood inundations based on quantitative precipitation estimation (QPE) and quantitative precipitation forecasting (QPF). These indices serve as essential warning criteria for heavy rain, inundation and landslides. Moreover, in Japan, the sensor webs combined with satellite data and internet of Things (IoT) help predict extreme events such as earthquakes and tsunamis. In the case of earthquakes, these predictions aid the early warning systems in providing advance notification to at-risk areas. Similarly in China, the China Meteorological Administration has built an impact-based typhoon forecasting system to support target communities. Since its development, typhoon casualties and losses in China between 1987 and 2018 decreased significantly (Figure 5).³⁹

While technology is playing a major role in disaster management, not all countries in the subregion have the capacity to use or access these technologies. In this regard, knowledge and data sharing as well as technical cooperation is crucial, especially as the subregion builds up more cross-border infrastructure. Already a number of initiatives on technical cooperation have taken place in the subregion. For example, ESCAP’s Regional Cooperative Mechanism for Drought Monitoring and Early Warning has helped Mongolia enhance its capacity to effectively utilize space applications for monitoring droughts (Box 8). Similarly, Sentinel Asia, an international cooperation platform and an initiative of the Japan Aerospace Exploration Agency (JAXA) promotes the sharing of remote sensing data and web-GIS technologies. Amongst East and North-East Asia countries, Russia and the Democratic People’s Republic of Korea are not members of Sentinel Asia and they could be encouraged to join the 28 countries that already participate.

The Asia-Pacific Disaster Resilience Network (APDRN) is yet another effort to strengthen regional resilience with a focus on innovations and partnership approaches. Focused on disasters that occur in the Ganges River Basin and Indian Ocean and pillared on ESCAP’s regional platform of multi-hazard

³⁸ ESCAP (2019) op.cit.

³⁹ *ibid*

early warning systems, it capitalizes on partnership networks with a hazard cluster approach. Such an approach could be replicated in the East and North-East Asia region with a focus on flooding and earthquake/tsunami responses.

In particular, the subregion's ageing population create challenges: older adults can be less adept at using communication technologies as well as prioritizing for disasters. Aligning and extending local authorities' current preparedness activities with national, then subregional ones, while examining planning and resource allocation to ensure they are inclusive of the aged, is both desirable and feasible.

Beyond resilience during disaster events, successful inclusion of aging populations also requires an emphasis on social connectedness. This means ensuring older people have an active community life and needed services, particularly around health and well-being.

Box 8. Drought Monitoring and Early Warning: Subregional Cooperation on Disaster Risk Reduction between China and Mongolia

Mongolia has perennially been prone to drought, desertification and dzud (winter storms) which often result in catastrophic losses of livestock and are critical for livelihoods of herder families. Considering the importance of forecasting droughts and dzuds to build resilience to these disasters, capacity development projects for Mongolian officials have been implemented with technical cooperation of a Chinese national institute.

The Institute of Remote Sensing and Digital Earth (RADI⁴⁰) of the Chinese Academy of Sciences (CAS), has provided substantive support on drought monitoring and early warning to the National Remote Sensing Center (NRSC) of Information and Research Institute of Meteorology, Hydrology and Environment (IRIMHE) of Mongolia under ESCAP's Regional Drought Mechanism. Through training in RADI or field surveys in Mongolia, Mongolian officials assessed key indices to analyze drought conditions and circumstances in Mongolia.

From 2017 to 2018, the project entitled "Enhancing Mongolia's capacity for drought/dzud monitoring and early warning" was conducted. With technical support from RADI, the DroughtWatch System, a GIS-based monitoring system, was installed in NRSC and operationalized with a capacity to produce early warning information 1-2 weeks in advance.

In September 2018, a manual was published as one of the outputs of the project⁴¹ and to be utilized in training for new officials.

As a following step, another three-year project was proposed in 2019. It aims to extend the lead time of early warning to 2-3 months (seasonal forecast of droughts and dzuds.) During the first year, 1) a model and software was developed for seasonal forecasting, 2) field data and information was collected through field research, and 3) its calibration was conducted. Based on outputs in 2019, the project plans to implement activities for capacity development of Mongolian officials.

4.2. Health and Well-being (SDGs 3, 10, 17)

Current Situation and Needs

Health and well-being, being featured as a stand-alone Sustainable Development Goal (SDG 3), is an integral aspect of resilient societies. Since 2000, East and North-East Asia has made notable progress on good health and well-being. Specifically, for targets 3.1 (maternal mortality), 3.2 (neonatal and child mortality), 3.7 (sexual and reproductive healthcare), 3.b (R&D of vaccines and medicines) and 3.d (health risk reduction and management), it is estimated that the targets could be achieved by 2030 with the current pace of progress. For targets 3.3 (epidemics and communicable diseases), 3.4 (non-communicable diseases and mental health), 3.6 (road traffic accident), 3.9 (deaths and illnesses from pollution), 3.a (tobacco control) and 3.c (health financing), success could be achieved if progress is accelerated. An area requiring immediate action to reverse current trend includes target 3.5 (substance abuse).⁴²

⁴⁰ The institute changed its name from RADl to Aerospace Information Research Institute (AIR) in 2020.

⁴¹ Available at: <https://www.unescap.org/resources/manual-droughtwatch-system#>

⁴² The United Nations Economic and Social Commission for Asia and the Pacific (2020). Asia and the Pacific SDG Progress Report 2020. Available at: <https://unescap.org/publications/asia-and-pacific-sdg-progress-report-2020>

At the country level, the performance on health and well-being is rather diverse, partly reflecting the level of development. Despite the significant improvement in China, Mongolia and the Russian Federation, Japan and the Republic of Korea outperform in most of the key indicators (Table 7). While health and well-being is often viewed as a domestic issue, the areas of concern discussed above are closely related to three megatrends, namely, urbanization, environmental degradation, and population ageing, which are likely to affect all countries in the subregion.

Table 7. Key Indicators of Health and Well-being in East and North-East Asia

	SDG target 3.2 Under-five mortality rate (per 1,000 births) ^a	SDG target 3.3 Tuberculosis Incidence Rate (per 1,000 population) ^b	Crude Death Rate (per 1,000 population) ^a	SDG target 3.9 Crude Death Rate, Household and Ambient Air Pollution (per 1,000 population) ^c	Life Expectancy at Birth (years) ^a
China	19	0.6	7.1	1.4	76.6
Democratic People's Republic of Korea	29	5.1	9.1	2.3	72.0
Japan	2	0.1	10.4	0.4	84.4
Mongolia	85	4.3	6.3	1.0	69.5
Republic of Korea	3	0.7	5.9	0.4	82.8
Russian Federation	7	72.3	12.7	0.9	72.3

a/ Estimated figures of the period 2015 to 2020. Source: United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, Online Edition. Rev. 1. Available at: <https://population.un.org/wpp/Download/>.

b/ Including HIV. Estimated figures of 2018. Source: World Health Organization (2019). Global Tuberculosis Report 2019. Available at: https://www.who.int/tb/publications/global_report/en/

c/ Figures in 2016. Source: Asia-Pacific SDG Partnership. Available at: <http://data.unescap.org/sdg/#data/3>.

Firstly, rapid urbanization has profound impacts on public health. Poorly managed urbanization is associated with risks to health and well-being, such as pollution, overcrowding, and inadequate service capacity for providing drinking water, sanitation and waste disposal. Under SDG 3, the lack of progress in target 3.3 (epidemics and communicable diseases) in the subregion is particularly related to fast urban growth. The high density of people in cities make it easier for diseases to spread. The recent outbreak of coronavirus (COVID-19) is a good example. Urbanization, accompanied by the rapid movement of people across borders, heightens global pandemic risk which warrants collective actions across countries (Box 9).

Box 9: Measures to Manage the COVID-19 Pandemic

To prevent the spread of infectious disease which transmits from person to person, one of the most effective measures is physical distancing. Efforts to reduce close contact in public spaces have all benefited from the Severe Acute Respiratory Syndrome (SARS), swine flu and COVID-19 experiences.

For the lessons learnt from COVID-19, on one hand, strict control measures (e.g., lockdown and travel control) in China, especially in the epicenter in Wuhan, has successfully reversed the escalating cases.⁴³ On the other hand, more targeted measures in the Republic of Korea, such as well-organized testing and contact tracking, enabled the identification and quarantine of infected individuals as early as possible, preventing them from perpetuating viral transmission.⁴⁴ In Japan, the cluster-based approach which ascertains the origin of the cluster of infections was used to prevent large-scale spread of infection caused by a chain of clusters of patients. Other measures, including the closure of entertainment venues, restriction on public gatherings and flexible work arrangements, also contributed to the containment of COVID-19 in different countries. Depending on the local situation, governments adopted different response strategies after balancing multiple imperatives, risks, costs and benefits.⁴⁵

In the closely connected global village, local measures are not enough. International cooperation is essential to fight the battle against the pandemic. Firstly, information sharing, e.g., the genetic sequence of virus, is critical to promote research and development of diagnostics, drugs and vaccines. As an example, the COVID-19 Technology Access Pool (C-TAP) was launched to provide a “one-stop shop” for sharing scientific knowledge, data and intellectual property in efforts to beat

⁴³ As the outbreak evolved and knowledge was gained, specific containment measures were adjusted to the provincial, county and even community context.

⁴⁴ The health, quarantine and economic measures taken by the Korean government throughout different stages of the spread can be found at the paper *Tackling COVID-19: Health, Quarantine and Economic Measures: Korean Experience*. Available at: <https://ecck.eu/wp-content/uploads/2020/03/Tackling-COVID-19-Health-Quarantine-and-Economic-Measures-of-South-Korea.pdf>

⁴⁵ A comprehensive list of government response could be found at <https://www.bsg.ox.ac.uk/research/research-projects/oxford-covid-19-government-response-tracker>

back the pandemic.⁴⁶ Secondly, regional coordination helps mitigate supply chain disruptions of daily essentials and medicinal products. Thirdly, border control and entry restriction would be much more effective if they can be done in a well-coordinated way instead of a unilateral notice. Fourthly, a public health emergency fund can help mobilize financial resources at the regional level and provide targeted support for countries that are most affected by the virus.⁴⁷ All these measures could be implemented in a timely and efficient manner with the help of a coordination mechanism with clear response plans under different scenarios. The United Nations global footprint at the national level is an asset for the global community to be leveraged to deliver the ambition needed to win the war against the virus.⁴⁸

Secondly, environmental degradation, accelerated by urbanization, is a key threat to health and well-being in the subregion, especially given the high level of air pollution compared to most parts of the world. The growing environmental risks have significant and long-lasting impacts on targets 3.4 (non-communicable diseases and mental health) and 3.9 (deaths and illnesses from pollution). Indeed, lung cancer and respiratory diseases are one of the biggest killers. Climate change is also causing more frequent occurrence of extreme heat, hitting hard on vulnerable population, particularly older persons. As global climate change will intensify environmental health issues, it is necessary for countries to strengthen joint actions to tackle this transboundary challenge.

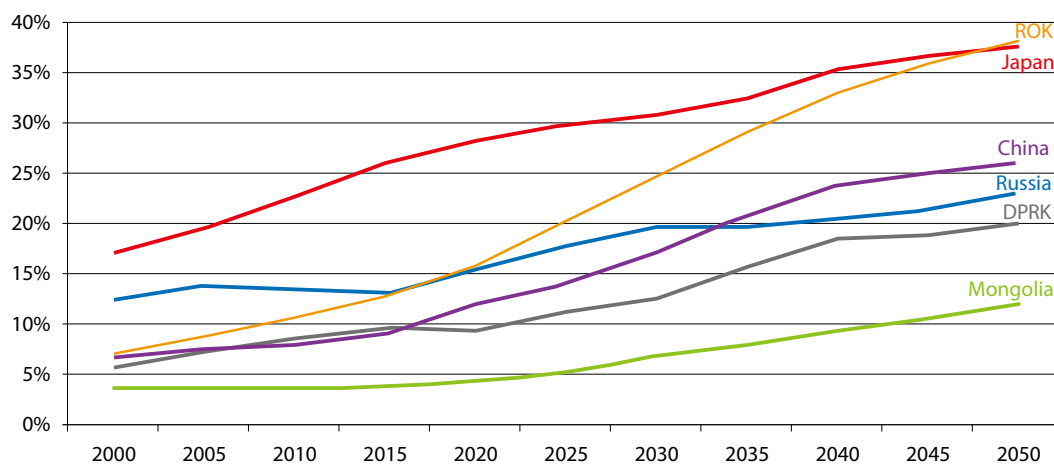
Lastly, populations are ageing rapidly in East and North-East Asia (Figure 4). The subregion is home to around one third of all older person aged 65 and above in the world. Three countries in the subregion are particularly noteworthy: China has the largest population of older persons in the world; Japan has the highest percentage of older persons in the world; and the Republic of Korea has the fastest rate of population ageing in the world.

⁴⁶ World Health Organization (2020). Available at: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/global-research-on-novel-coronavirus-2019-ncov/covid-19-technology-access-pool>

⁴⁷ The United Nations Economic and Social Commission for Asia and the Pacific (2020). *The Impact and Policy Responses for COVID-19 in Asia and the Pacific*. Available at: <https://www.unescap.org/resources/impact-and-policy-responses-covid-19-asia-and-pacific>

⁴⁸ United Nations (2020). *Shared Responsibility, Global Solidarity: Responding to the socio-economic impacts of COVID-19*. Available at: <https://unsdg.un.org/sites/default/files/2020-03/SG-Report-Socio-Economic-Impact-of-Covid19.pdf>

Figure 5 Share of Population Aged 65 and Above



Source United Nations, Department of Economic and Social Affairs, Population Division (2019). *World Population Prospects 2019, Online Edition, Rev. 1.*

While rising life expectancy is one of humanity's major achievements, population ageing presents unprecedented economic and social challenges. From the perspective of health and well-being, although people now live longer, they are expected to spend more years with impairment. Population ageing would also lead to an increase in non-communicable diseases (target 3.4) as well as a higher demand for health care and long-term care, adding pressure to healthcare systems and public finance. Moreover, older persons are often disproportionately affected by disasters because of their physical, social and economically vulnerabilities.⁴⁹ Their needs are usually not met during disaster response and they are left behind when it comes to disaster risk reduction.⁵⁰ This structural change in demography highlights the need for increased attention to and resources for issues connected to holistic health and well-being across the subregion.

⁴⁹ For example, the Great East Japan Earthquake and Tsunami in 2011 claimed 15,853 lives with more than half of them aged 65 years or older. Source: HelpAge International (2013). *Displacement and older people: The case of the Great East Japan Earthquake and Tsunami of 2011*. Available at: <https://www.helpage.org/silo/files/displacement-and-older-people-the-case-of-the-great-east-japan-earthquake-and-tsunami-of-2011.pdf>

⁵⁰ The United Nations Economic and Social Commission for Asia and the Pacific (2017). *Addressing the Challenges of Population Ageing in Asia and the Pacific: Implementation of the Madrid International Plan of Action on Ageing*. Available at: <https://www.unescap.org/publications/addressing-challenges-population-ageing-asia-and-pacific-implementation-madrid>

Opportunities for Subregional Cooperation

Infectious diseases do not recognize borders. In a highly interconnected world with rapid urbanization, a contagious disease can easily spread worldwide. Given the increasing exchange of people and goods across countries, regional cooperation is essential to ensure responsive and effective measures to the outbreak of infectious diseases.

Joint Response Against Infectious Diseases

To that end, the Memorandum of Cooperation and the Joint Action Plan among China, Japan and the Republic of Korea on Joint Response against Pandemic Influenza A (H1N1) and Emerging and Re-emerging Infectious Diseases of Common Concern are good examples of regional cooperation. The three countries have worked together and effectively responded to a number of global public health emergencies over the years, including pandemic influenza A (H1N1), avian influenza (H7N9) and Ebola virus disease. There are several key areas of cooperation, such as trilateral communication mechanism through the International Health Regulations national focal points, rapid information sharing platform, surveillance, early-warning and epidemiological investigation, infectious disease control measures, development of strategies to minimize outbreaks by using joint simulation and table-top exercises, and development of diagnostics and vaccine.⁵¹

In response to the outbreak of COVID-19, China, Japan and the Republic of Korea have cooperated closely to share information on the situations in their countries as well as experiences in preventing the further spread of the virus. On 20 March 2020, the three countries held a Special Foreign Ministers' Video Conference on COVID-19 which increased the momentum for information exchange and cooperation. In addition, on 15 May 2020, the three countries held a Special Video Conference of Tripartite Health Ministers' Meeting on COVID-19 Response, sharing information on each country's current situation and national strategies to be focused on in response to COVID-19. During the 75th Session of United Nations General Assembly, ROK President Moon Jae-in proposed launching a Northeast Asia Cooperation Initiative for Infectious Disease Control and Public Health, with the participation of China, DPRK, Japan, Mongolia and ROK to guarantee collective protection of life and safety via more inclusive cooperation.

⁵¹ *Joint Statement of The 12th Tripartite Health Ministers' Meeting*. Available at: https://tcs-asia.org/en/board/news_view.php?id=3307

China, Japan and the Republic of Korea have also collaborated through ASEAN Plus Three (APT) by holding a Special Video Conference of Senior Officials Meeting on Health Development on 3 February 2020, and a Special ASEAN Plus Three Summit on COVID-19 on 14 April 2020, with the leaders reaffirming their commitment to make more joint efforts to prevent the risk of COVID-19. The Joint Statement of the Summit outlined several important initiatives, including setting up an APT reserve of essential medical supplies, and strengthening scientific cooperation in epidemiological research through the APT Field Epidemiology Training Network.⁵²

Asia Pacific Strategy for Emerging Diseases and Public Health Emergencies

Moving forward, the expansion of this tripartite cooperation to other countries would be important. Regional cooperation on infectious disease preparedness and response could be strengthened through the implementation of the Asia Pacific Strategy for Emerging Diseases and Public Health Emergencies (APSED III). The strategic framework reflects the all-hazard approach adopted by the Asia Pacific region and provides an important collaborative platform for member States, World Health Organization and partners to work together to strengthen preparedness and response to outbreaks and public health emergencies.⁵³

Leveraging Technology to Support Older Persons

Regarding population ageing, the Third Review and Appraisal of the Madrid International Plan of Action on Ageing in Asia and the Pacific highlighted the need to expand and harness scientific research, expertise and technology to address the social and health implications of ageing.⁵⁴ Box 10 discusses some examples of how technology could be utilized to enable healthy ageing. Countries in the subregion, especially China, Japan and the Republic of Korea, have been actively promoting the

⁵² ASEAN (2020). *Joint Statement of the Special ASEAN Plus Three Summit on Coronavirus Disease 2019 (COVID-19)*. Available at: <https://asean.org/joint-statement-special-asean-plus-three-summit-coronavirus-disease-2019-covid-19/>

⁵³ The eight focus areas in APSED III are as follows: (i) public health emergency preparedness, (ii) surveillance, risk assessment and response, (iii) laboratories, (iv) zoonoses, (v) prevention through health care, (vi) risk communication, (vii) regional preparedness, alert and response, and (viii) monitoring and evaluation. Source: World Health Organization (2017). *Asia Pacific Strategy for Emerging Diseases and Public Health Emergencies*. Available at: <https://iris.wpro.who.int/bitstream/handle/10665.1/13654/9789290618171-eng.pdf>

⁵⁴ United Nations Economic and Social Commission for Asia and the Pacific (2018). *Report of the Asia-Pacific Intergovernmental Meeting on the Third Review and Appraisal of the Madrid International Plan of Action on Ageing*. Available at: https://www.unescap.org/sites/default/files/AgeingMeetingReport_DEC18.pdf

application of technology for healthy ageing. The national initiatives led by governments and innovations by an increasing number of private sector enterprises have resulted in significant progress. In this regard, regional and international cooperation could support countries for customizing the use of technology for healthy ageing as well as creating forward-looking policies based on national contexts.⁵⁵

Collaboration among countries in the subregion, especially China, Japan and the Republic of Korea, is crucial given the rapid population ageing they are undergoing and their technological advancement. The 4th Korea-Japan-China Science and Technology Ministerial Meeting as well as the 2019 International Meeting on Technology for Ageing in East and North-East Asia organized by ESCAP are good starting points for subregional cooperation. An institution or a platform that regularly convenes experts and officials, co-ordinates and funds research, and ensures that governments, the private sector and civil society actors can access, adapt and incorporate results into policies would be desirable. For example, it could cover collaboration between testbed labs with a mutual recognition mechanism, initiative on talent development, and a one-stop information sharing platform. Sharing knowledge and best practices on the use of technology for ageing are mutually beneficial to address the common challenges of population ageing for the subregion and beyond.

⁵⁵ Government has a critical role in creating enabling policy frameworks to promote the utilization of existing technology as well as the development of new technology for older persons. For example, in China, demonstration zones have helped the promotion of technology products. In Japan, the Welfare Equipment Rent Program allows older persons to rent assistive devices at a lower cost, driving stronger market demand and research efforts on assistive devices. In ROK, the Rehabilitation Robot Business Support Project provides clinical application testbeds for rehabilitation robots seeking commercialization.

Box 10: Examples of Technology for Healthy Ageing

Technology can improve the delivery and quality of health care, satisfying the diversified needs of all population groups with higher cost effectiveness. Technology can be applied to multiple fields, including prevention and health promotion, delivery of healthcare and medical services, and healthcare development.

Health monitoring devices, such as watches and wristbands, can measure and monitor various biometric parameters. By keeping track of the vital signs, immediate support could be delivered in case of accident. The health parameters are useful for self-monitoring, informing precautionary and corrective measures. The information can also be transmitted to relevant care givers, enabling early diagnosis as well as professional and continuous assessment of the older persons' health conditions.

Medical systems using ICT provide people in both urban and rural areas with better access to medical services. Medical consultations can be delivered via videoconference, without the need for in-person visits, which is especially suitable for regions with limited health resources. The ICT medical service model is particularly useful for chronic diseases that require continuous monitoring and long-term treatment.

The advance in technology has revolutionized the healthcare industry. 3D printing can create personalized medical tools, such as artificial bones and organs. The use of nanotechnology brings breakthrough to drug delivery and genetic engineering. AI can analyze large quantities of data to help diagnose disease, develop new drug and treatment, and identify the most effective health promotion and prevention interventions. With the assistance from robot, doctors can perform delicate and complex surgery remotely with minimal invasion.

5. Conclusion

There are, of course, an array of challenges facing the East and North-East Asia subregion. There can never be the political will or resources to comprehensively tackle issues all at once, nor to balance the divergent needs of all stakeholders equally. At this time when the subregion, along with the rest of the world, is focusing on responding to COVID-19 and the long-term socioeconomic impacts that would come in the aftermath of COVID-19, this report finds that there are subregional actions that would help countries achieve resilient recovery and move the subregion towards a more sustainable development path in line with the 2030 Agenda for Sustainable Development.

(i) Energy Cooperation for Battling Climate Change

Considering that the importance of reliable and affordable energy supply is crucial for economic recovery, expanding cross-border electricity network utilizing renewable energy sources would ensure a stable supply of electricity, diversification of supply chains for energy security, and transition towards clean, sustainable energy.

A multidisciplinary platform to plan for subregional power interconnection should be created. This platform should bring in technical, economic, social, legal, environmental and business experts to coordinate with political and administrative leaders to build upon numerous feasibility studies and take steps towards realizing cross-border energy markets.

Climate change is, of course, a macro-issue that affects all others. The subregion, with its dynamic, resource-hungry economies, should strive towards global leadership. A subregional forum to focus on carbon emissions could be evolved out of the North-East Asian Subregional Programme for Environmental Cooperation, which currently lacks a climate change mandate. This forum could focus on the challenges and opportunities that would come with a subregional carbon market.

(ii) Broad-based Trade and Transport Connectivity for Shared Growth and Prosperity

In the context of the COVID-19 pandemic, the importance of preserving seamless connectivity has never been more acute, particularly in maintaining cross-border movement of essential goods. Going forward, strengthening policy coordination between trade and transport sectors is key in supporting

economic dynamism in the subregion as well as in building resilience for crisis management. In particular, subregional cooperation on operational connectivity, pursued separately on transport facilitation and on trade facilitation, could be further enhanced by building more policy coordination in this area. To this end, several approaches could be pursued.⁵⁶

At a strategic policy level, existing institutionalized processes of subregional organizations may be utilized to propagate a more broad-based policy approach to connectivity jointly involving transport and trade. For instance, under the organizational structure of the Greater Tumen Initiative (GTI), the Transport Board and Trade and Investment Committee could have regular joint engagements and dialogues to discuss policy issues of mutual interest. Such a new arrangement reflects responsiveness to the changing needs of the sectors. In addition, being embedded in institutionalized mechanisms ensures sustainability building on progress in cooperation so far achieved in these sectors.

At an operational level, data sharing and interconnections across information systems used separately for transport facilitation and trade facilitation could be merged, where it is practicable. This is most useful for an integrated border management, which is important to the subregion with several countries sharing borders, especially for landlocked developing country Mongolia. In the context of the COVID-19 pandemic, joint policy responses from trade and transport sectors to preserve safe and seamless connectivity provide fertile ground to start on, further acting on ad-hoc measures towards longer-term, institutionalized arrangements. In this regard, a joint UN project for contactless, seamless and collaborative transport solutions along the Asian Highway Network provides further impetus for a broad-based and inclusive cooperation on connectivity.⁵⁷

More than ever, ICT have the potential in providing new solutions not only to address challenges within the realm of connectivity but also as source of innovative solutions for socio-economic issues related to health, education, among others. Going forward, East and North-East Asia, home to economies at the frontier of technological advances, have a range of areas to deepen cooperation on ICT connectivity, for instance, using ICT infrastructure co-deployment with other sectors (e.g. energy, transport).⁵⁸

⁵⁶ ESCAP (forthcoming). *Subregional Study on Policy Coordination on Trade and Transport Facilitation in East and North-East Asia*.

⁵⁷ https://www.unescap.org/sites/default/files/ESCAP_Transport%20Policy%20Reponses%20to%20Covid-19%20along%20the%20Asian%20Highway%20Network.pdf

⁵⁸ ESCAP, 2020. *ICT Infrastructure Co Deployment with Transport and Energy Infrastructure in North and Central Asia* (<https://www.unescap.org/resources/ict-infrastructure-co-deployment-transport-and-energy-infrastructure-north-and-central>).

(iii) Subregional Cooperation to Support Healthy and Resilient Societies

Joint responses are needed to fight against infectious diseases. It is recommended to scale up ESCAP's subregional and regional cooperation mechanism to improve regional public health preparedness and response systems, including systems of prevention and monitoring of infectious diseases, to better cope with new or pre-existing epidemics and pandemics. It would help keep all regional actors informed of resources and strategies and strengthen collaboration. In addition, a public health emergency fund could be established to help mobilize financial resources at the subregional and regional levels and provide targeted support for countries that are most affected by the virus. A more in-depth subregional version of the COVID-19 Technology Access Pool (C-TAP) - a "one-stop shop" for sharing scientific knowledge, data and intellectual property – could also be founded. It perhaps could be expanded to include areas such as trade and logistics resilience in the face of disease spread.

Harmonizing the efforts of certain countries in the subregion, especially China, Japan and Republic of Korea, on the use of technology for healthy ageing and resilience is also recommended. An institution to coordinate knowledge-sharing on the use of technology for ageing is encouraged. A focal point could and should be strategies and tools for resilience amongst ageing populations, particularly with regards to infectious diseases and natural disasters.

Greater discussion on tackling air pollution in the subregion is vital. A regularized forum to build on the Summary Report for Policymakers of the Long-Range Transboundary Air Pollution in Northeast Asia (LTP) in November 2019 is recommended. While assessing pollution burdens and externalities is politically difficult, such a forum could be an early attempt to build awareness and consensus.

(iv) Environmental Cooperation for Inclusive Multilateralism and Building Stronger Institutional Frameworks in East and North-East Asia

Amongst various areas of functional cooperation in East and North-East Asia, environmental cooperation provides a unique ground for practicing the most inclusive multilateralism in terms of membership. In particular, NEASPEC and EABRN provide the opportunity for all countries to take part in subregional environmental cooperation while each country has a different level of participation. Such mechanisms also help define the geographical and political scope of East and North-East Asian multilateral cooperation. General determinants for defining a (sub)region, such as general geographic

proximity, regularity and intensity of interactions, and shared perceptions among societies which are not universally applied to many functional cooperation mechanisms in East and North-East Asia. In this context, environmental cooperation plays a significant role in defining the scope and membership of East and North-East Asian subregional cooperation, and levels the playing field for all countries involved, thereby contributing to inclusive subregional cooperation. Building on the existing environmental cooperation, the subregion can expand the cooperation mechanism into directly relevant fields such as energy and connectivity issues, as well as enhancing resilience to natural and man-made disasters in the subregion. In order to do so, East and North-East Asia countries need to agree on a strategy for scaling up existing subregional mechanisms on environmental cooperation with a view to developing a broad-based institution which has the necessary political backing from all member countries. To scale up the existing subregional mechanisms on environmental cooperation could include the following approaches: Firstly, promoting “nature-based solutions (NBS)” as a central piece of the subregional environmental cooperation agenda. Actions on NBS not only can protect, sustainably manage and restore natural or modified ecosystems but at the same time simultaneously address society challenges, providing benefits to human well-being and biodiversity. Secondly, accumulating objective and verifiable scientific data on environmental issues as a basis and indispensable factor for further institutionalizing environmental cooperation. Thirdly, fully utilizing and connecting with global agendas and agreements such as the 2030 Agenda for Sustainable Development, the Paris Agreement and the post-2020 Biodiversity Framework as a basis for deepening subregional environmental cooperation, and engaging currently non-active member countries and stakeholders.

