

**United Nations University (UNU) Summary Input
for 2023 High-level Political Forum and ECOSOC**

“Accelerating the recovery from the coronavirus disease (COVID-19) and the full implementation of the 2030 Agenda for Sustainable Development at all levels”.

1. Progress, experience, lessons learned, challenges, and impacts of the COVID-19 pandemic on the implementation of SDGs 6, 7, 9, 11 and 17 from the vantage point of your intergovernmental body, bearing in mind the three dimensions of sustainable development and the interlinkages across the SDGs and targets, including policy implications of their synergies and trade-offs:

UNU institutes globally have conducted research on the progress, challenges, lessons learned, and impacts of the COVID-19 pandemic on implementing the SDGs. They have also identified interlinkages between the SDGs.

Regarding the SDGs under review, UNU's research has focused on the following areas:

Clean water and sanitation (SDG 6)

The COVID-19 pandemic has significantly delayed progress towards achieving access to clean water, which poses a great challenge in achieving food security (SDG 2) and temporarily diverted attention (both public and political) from water security (SDG 6) and climate adaptation challenge (SDG 7). In vulnerable Global South countries, cultural habits and reliance on conventional energy and water generation systems pose significant challenges. UNU [research](#) finds that adopting a water-energy-food (WEF) nexus approach can provide an integrated solution to address these challenges and achieve SDGs 2, 6 and 7. For instance, agrophotovoltaics (APV) is a WEF nexus technology that supports solar energy generation while minimising the loss of arable land, thereby improving livelihoods, and creating value for rural communities, while addressing climate change.

To accelerate progress towards SDG 6, decentralised water resource management and an integrated approach are key priorities. A UNU research project on [Water for Sustainable Development](#) aimed to improve regional environmental and economic policies in four case study countries in Asia. Researchers found that agricultural sectors consume the largest amounts of water, and developing water-saving agriculture, erosion control and landslide management systems, flood prevention, drainage system optimisation, and the adoption of water-saving technologies can improve water-use efficiency. For tourism and other manufacturing sectors that

overuse groundwater sources, water supply quotas, paid water supply, and double-charging strategies can be implemented. Additionally, policy should prioritise water pollution control on the supply-side, and levying environmental taxes on service sectors and livestock to offset the high investment cost.

UNU aims to address water stress and declining water quality by focusing on institutional research projects that consider social, environmental, and economic priorities. The COVID-19 pandemic has highlighted the role of water reuse in improving water quality and reducing the risk of spreading viruses. However, fragmented legal, institutional, and administrative frameworks, poor data availability, and lack of financial, human, and technical capacity remain challenges to achieving SDG 6 targets.

Affordable and clean energy (SDG 7) and industry, innovation, and infrastructure (SDG 9)

According to recent developments, the COVID-19 pandemic initially had a positive effect on the phaseout of coal, but the geopolitical conflict between Russia and Ukraine had unforeseen implications for the global coal phaseout. The effect was particularly evident in coal exporting countries of the Global South, where it has slowed down coal phaseout plans and even led to production increases. This poses a threat to the realisation of SDG 7, which aims to ensure access to affordable, reliable, sustainable, and modern energy for all.

Despite the increase in the share of renewable energy in many countries, the world is still not on track to achieve SDG 7 and the Paris Agreement goals. The transition to electric mobility has the potential to reduce emissions from the traffic sector, but it also creates potential new environmental problems, such as the management of end-of-life batteries. This highlights the interlinkages between SDG 7 and SDG 9, which aims to promote industry, innovation, and infrastructure in the Global South, particularly in managing the waste generated from end-of-life batteries.

To contribute to the sustainable energy transition and the sustainable transition to e-mobility, UNU institutions have undertaken several projects. For instance, UNU's [NEXtra Core project](#) evaluated the status quo and potential pathways for a timely, just, and sustainable phaseout of coal in four coal-producing and -exporting countries of the Global South. The project identified several challenges, such as long-term environmental management and the need for economic and employment alternatives for a just transition. Similarly, another UNU project examined the challenges of [managing end-of-life electric vehicle batteries](#) and tackled the implications of exporting used hybrid and battery electric vehicles with lithium-ion batteries to the Global South. This issue poses significant challenges for importing countries that lack facilities for safe recycling or disposal of end-of-life batteries.

Sustainable cities and communities (SDG 11)

The COVID-19 pandemic negatively impacted cities and communities in several ways, including: placing urban infrastructures (healthcare, transport, clean water, critical services) under severe stress, revealing the fragility and vulnerability of international and cross-border supply chains, and inhibiting the exchange and interaction between urban actors, adding to the already existing burdens of vulnerable urban populations and local communities. UNU's research on the [interconnectedness of systems](#) has identified the cascading and systemic nature of risks in urban areas, underlining the need to have a comprehensive and multi-dimensional understanding of all related factors and the importance of early preparation.

The urgent need to accelerate progress on the 2030 Agenda and achieve the Sustainable Development Goals (SDGs) within the next seven years has further highlighted the importance of localisation of the goals and targets. Local stakeholders have unique knowledge and capacities for developing tailored solutions to sustainable development challenges, and multi-stakeholder working groups play a critical role in systematic SDG monitoring and evaluation at the national and subnational levels. Sub-national governments should adopt SDGs-related approaches to support local strategies and accelerate digitalisation of services. The COVID-19 pandemic emphasised the importance of strengthening cities' financial resilience to navigate and recover from socioeconomic adversity. Findings from UNU's research on [the impact of COVID-19 on city finances](#) concluded that cities should conduct fiscal optimisation and crisis budgeting to improve own source revenue, adapt budgeting formats and link urban planning with investments to facilitate long-term financial planning, undertake comprehensive finance reviews to inform policy and increase budget transparency and accountability, introduce e-government tools in city financial management and participatory budgeting, and leverage public-private and civil society partnerships for public service provision.

Partnerships for the goals (SDG 17)

SDG 17, Partnership for the Goals, emphasises the importance of collaboration among various stakeholders to achieve sustainable development. The 2030 Agenda highlights the need to transform global development through an integrated approach, equal relationships among member states, and comprehensive and inclusive responses for development issues and challenges.

To achieve this, UNU institutions collaborate with financial sector actors to implement solutions for modern slavery and human trafficking. Collaborative action with institutional investors, banks, and financial regulators helps to implement effective solutions and share best practices. UNU also encourages public-private partnerships (PPPs) in the water sector can unlock the potential for innovative solutions and technologies to optimise urban water management in

industrial and agricultural settings. PPPs offer a promising approach to access financial resources, tap into private expertise, and promote new technologies.

Overall, SDG 17 is highlighted through the need to leverage public-private and civil society partnerships for public service provision. Collaborative action between various stakeholders can help to address complex sustainable development challenges and create innovative solutions for a better future.

2. Three key areas where transformative actions for accelerated progress have been successful, and three key areas where support is most urgently needed, with regard to the cluster of SDGs under review in July 2023:

To accelerate progress towards SDG 6 (Clean Water and Sanitation), successful transformative actions include promoting decentralised water resource management, implementing quota water supplies and double charging for overusing industries, and implementing cleaner production and wastewater treatment practices. Significant resources, technical expertise, political will, and stakeholder engagement are required to achieve this. Urgently needed support for SDG 6 includes developing small-scale water storage reservoirs, implementing national, regional, and local level water budgeting tables and environmentally extended input-output model analysis, and prioritising controlling water pollution on the supply side by levying environmental taxes from service sectors and offsetting the high investment cost for the livestock sector.

To achieve SDG 7 and SDG 9, several key areas of transformative action have been identified. Firstly, experts from coal-producing countries in the Global South have collaborated to develop strategies for a just and sustainable phase-out of coal. Secondly, significant progress has been made in renewable energy deployment, energy efficiency improvements, and access to modern energy services in some countries. However, there are still three key areas where support is needed. Firstly, the rapidly growing number of end-of-life lithium-ion batteries from electric vehicles poses a significant risk to the environment and public health in the Global South. This could potentially negate the progress made in sustainable transportation in the Global North and contribute to growing electronic waste problems in the Global South. Secondly, the geopolitical conflict between Russia and Ukraine and subsequent Western bans on fossil fuels from Russia have had a strong impact on coal-exporting countries in the Global South, leading to increased production levels. Finally, governments and international organisations must prioritise promoting energy access in developing countries, as well as energy storage and clean cooking solutions.

For SDG 11 (sustainable cities and communities), transformative actions that have been successful include multi-stakeholder partnerships, sub-national governance, and strengthening city finances. However, support is urgently needed to identify vulnerable energy users, improve governance mechanisms, and enhance support measures for vulnerable energy users.

In relation to SDG 17, significant strides have been made towards expediting progress through transformative measures, such as fostering global research collaboration on water security and climate adaptation. This has involved active involvement from local communities, industry players, and political stakeholders. Additionally, transnational learning opportunities have been established to facilitate access to knowledge on water security and climate adaptation beyond the confines of individual projects. Despite these achievements, urgent support is needed in several areas. Firstly, the lack of comprehensive documentation on successful climate adaptation practices is a hindrance to their replication. Secondly, Resource Nexus/Sustainability Nexus strategies have not been widely implemented in real-world scenarios, despite their immense potential in aligning climate and water objectives with other environmental goals while mitigating unwanted trade-offs.

3. Examples of specific actions taken to recover from the COVID-19 pandemic that also accelerate progress towards multiple SDG targets, including actions identified by your intergovernmental body, building on interlinkages and transformative pathways for achieving SDGs:

The impacts of the pandemic, including lockdowns and disruptions to global supply chains have affected the pace of progress towards the achievement of multiple SDG targets. UNU institutes have taken different approaches to recover from COVID-19 pandemic setbacks, ensure alignment of strategic planning for research, and mobilise on multidisciplinary strategies.

Community-based solutions and urban transformation

Urban areas struggled particularly hard during the COVID-19 pandemic, which further stressed the value of community networks in problem solving. In regions with strong communities, assistance and recovery efforts frequently began sooner. Additionally, community-based strategies have the potential to endure future challenges and provide a springboard for additional initiatives to empower citizens in line with the 2030 Agenda's "leave no one behind" philosophy.

One example of a UNU led project in this area includes the Mesa Salud Project which is situated in the informal settlement of Villa 20 in Buenos Aires, Argentina. Mesa Salud was established with the aim to support the local population in limiting the spread of COVID-19 by means of building and promoting robust health care, food security, communication, hygiene and sanitation



networks. Through community-level planning, larger urban transformations towards sustainability can be initiated and accelerated, and the achievement of multiple SDGs targets can be supported.

UNU has also leveraged its research capacities towards strengthening cities' financial resilience to navigate and recover from socioeconomic adversity – the better-equipped cities are to plan and manage their finances, the faster cities can bounce back better. Policy research in this field has engaged with policymakers and financial managers to work at the grassroots level and chart an effective and sustainable financing path appropriate for their local community contexts.

Technology and systems-level approaches

The role of technology in ensuring effective and rapid communication, collaboration and resource allocation was witnessed in many parts of the world during COVID-19. The impacts of the pandemic, such as lockdowns and the disruption to global supply chains, have affected the deployment of [different collaborative projects at UNU](#), including agrophotovoltaic and hybrid energy systems in Africa to support solar energy generation while minimising the surface area loss of arable land (SDG 7).

Acute concerns related to the COVID-19 pandemic have also emerged, including the increased use of pharmaceuticals engendering the increasingly salient role of wastewater treatment to remove these contaminants from aquatic systems. With such emerging environmental concerns, UNU has worked to assess the environmental, economic, and social impacts, including health impacts to better understand the prospective risks and opportunities, and identifying policy options related to industrial and agricultural water reuse. For example, the UNU led initiative on the [Safe Use of Wastewater in Agriculture \(SUWA\)](#) has adapted its priority areas to best promote the safe and productive use of wastewater in the face of such global contamination pressures. UNU has also led research in the past year to identify the research gaps on water reuse applications in the private sector and the barriers to its adoption in the framework of public-private partnerships to build resilience, raise awareness and increase the adaptive capacity of the water sector.

4. Assessment of the situation in the mid-point of the implementation of the 2030 Agenda and the SDGs, against the background of the COVID-19 pandemic and within the respective areas addressed by your intergovernmental body, and policy recommendations, commitments, and cooperation measures for promoting a sustainable, resilient, and inclusive recovery from the pandemic while advancing the full implementation of the 2030 Agenda:

Community-based solutions and urban transformation

Through this lens, as we assess the progress at the mid-point of implementation of the 2030 agenda, community involvement in addressing COVID-19 in certain parts of the world has showcased its immense potential to co-create and collaborate with the local community. Despite the challenges presented by the COVID-19 pandemic, citizens groups and private actors have upscaled efforts to achieve SDGs, particularly SDG 11, which can lead to transformative actions for cities. For example, UNU has been advancing a model for SDGs localisation through activities in Kanazawa, Japan. Working with the local government and diverse local stakeholders city-level SDGs indicators have been developed resulting in the implementation of a platform for public–private partnership on the SDGs, IMAGINE KANAZAWA 2030. Such local government collaborations have the potential for being further upscaled.

The enormity of challenges in achieving the SDGs while concurrently addressing climate change demands that top-down and hierarchical models of decision making should proactively consider delegation and devolution of decision making, including financial allocations and resource management, particularly at the local level. New and innovative forms of formal, as well as informal governance, have emerged during COVID should inform and inspire more participatory future urban decision-making.

Technology and systems-level approaches

Socio-technological solutions have faced significant challenges throughout the COVID-19 pandemic. Given that world's supply of technological components is concentrated outside the Global South, the installation and deployment of technology transfer projects have been significantly derailed. The continued support of systemic technological capacity building initiatives in the Global South will continue to be a hallmark of UNU's strategic planning to support SDG 9, and a proactive approach will be adopted to best solve such shortfalls in the medium term.

Integrated approaches to water security and climate adaptation have continued advancing both in science and policy. Nevertheless, their high complexity remains challenging, as data availability and accessibility have also presented themselves as major bottlenecks, particularly in the achievement of SDG 6. In these data-scarce regions, interdependencies between different environmental resources are sometimes not fully understood. To be able to assess

rigorously the extent and potential of water circularity in both the public and private sectors, enhancing data sharing and presentation systems can help to reduce the dramatic impact of COVID-19 on environmental and human health.

Even though the share of renewable energy has increased in many countries of the world, the pace has not been fast enough. The fact that the world has just experienced a peak in coal consumption, and that global CO₂ emissions from fossil fuels have reached a record high clearly indicate that the world is off-track regarding SDG 7 and the Paris Agreement goals. At the same time, the transition to electric mobility has the potential to significantly decrease emissions from the traffic sector, but potentially at the price of new environmental problems, including the management of EOL batteries. Strategies to handle this emerging waste stream, at its full scale, must be developed rapidly to avoid a negative environmental footprint and public health impacts, particularly in countries of the Global South.

5. Key messages for inclusion into the Political Declaration of the September 2023 SDG Summit:

Inclusive and Goal-Driven Recovery

The COVID-19 pandemic has demonstrated that rising inequality and marginalisation are serious concerns, especially in relation to climate change. The world is not on track to attain the goals of the Paris Agreement and SDG 7. Further, CO₂ emissions from fossil fuels reached an all-time high in 2022. As technological innovations, such as the transition to electric mobility, proliferate in the Global North, there is an urgent need to address the growing technical and human resource demand for recycling existing energy sources, such as end-of-life batteries, which could otherwise render a "green" technology unsustainable. To accelerate the phaseout of fossil fuels in a just, sustainable, and proactive manner, significant efforts are required.

Interdisciplinary Partnerships

An inclusive recovery can only be achieved if all stakeholders agree on measures and policies and, at best, co-create them. To do so, trust must be built as a long-term foundation for strong coalitions. Coalition building through public-private actors as well as civil society groups is critical in strategic planning for SDG achievement. To harmonise sustainable policies in heterogeneous spaces, conducive policies and governance mechanisms must be developed. Strong partnerships can also assist in connecting technological innovations to communities and facilitating implementation. There is growing recognition of the importance of involving local communities, given their unique knowledge and capacities to develop specifically tailored solutions to sustainable development challenges. Sub-national governments can also adopt SDG related approaches that support local strategies. As well as improvements in North-South and South-South collaborations, these are positive trends.

Equity in Digitalisation

Digitalisation and technology are powerful tools for accelerating SDG achievement. Priority should be given to making adequate frameworks and resources available in a timely and sustainable manner in order to maximise such benefits. Additional attention should be paid to the abatement of existing inequalities. The aftereffects of digitalisation must also be addressed adequately and proactively. Given the proximity of sub-national and local governments to their communities, significant efforts should be expended to accelerate digitalisation of services, in particular, in the Global South.

Early planning and preparedness

COVID-19 highlighted how systems and risks are interconnected and how these risks can cascade and impact across multiple sectors (water, energy, infrastructure, food) and on multiple levels. This requires a comprehensive and multi-dimensional understanding of how all related factors interact and how early preparation to respond to existing and potential risks is vital. Such planning should consider not only existing risks and vulnerability drivers, but also emerging factors, and prepare for both short term and long term impacts based on rigorous scientific evidence and research.

Annex I

UNU Institute for the Advanced Study of Sustainability (UNU-IAS), Japan

Institute Input for 2023 HLPF and ECOSOC

SDG 6 (clean water & sanitation)

To accelerate progress on SDG 6 a key priority is to promote decentralised water resource management and an integrated approach that fully recognises the multiple values of water. Key insights from UNU-IAS case study research with local experts in Asia include the following:

- The agricultural sector consumes the largest amount of water of all economic actors. Solutions to improve water use efficiency include developing water-saving agriculture, controlling erosion and landslide management systems, preventing floods, reducing leakages in the drainage system, and adopting water-saving technologies.
- For tourism and other manufacturing sectors, quota water supply, paid water supply, and double charging can be implemented for industries that overuse groundwater sources. Alternatively, development of small-scale water storage reservoirs will reduce dependence on water sources like rivers and groundwater.
- Water stakeholders should meet and review the water demand and supply regularly. Innovative ideas and adopting water-use saving technologies should be shared and promoted.
- National, regional and local level water budgeting tables and environmentally-extended-input-output (EEIO) model analysis are effective tools for policymakers to understand the distribution of water resources for economic activities and prevent social conflicts among water users.
- Manufacturing has been a major contributor of water pollution; cleaner production and wastewater treatment practices should be implemented for direct pollution control. Similarly, service sector waste (hotels and restaurants) can be better handled by expanding the capacity of wastewater treatment plants and complying with discharge standards.
- UNU-IAS research provides policy directives for controlling water pollution by analysing how sectoral outputs in the economy contribute to water pollution. Managing the demand of high polluting sectors is an effective way to curb water pollution.
- In addition to traditional approaches, policy should also seek and prioritise water pollution control on the supply-side (indirect pollution). There is strong evidence on the benefits of levying environmental tax from service sectors and offsetting the high investment cost for the livestock sector.

Source:

Chapagain, Saroj, Mohan, Geetha and Fukushi, Kensuke (2022). Water for Sustainable Development Casebook: Recognising the Value of Water for Sustainable Development. UNU-IAS.

SDG 7 (affordable & clean energy)

As carbon neutrality policies aim to advance the energy transition towards net zero emissions, it is essential to ensure universal access to clean energy and energy efficiency solutions. Among developed nations, national commitments toward carbon neutrality offer different levels of support for vulnerable groups. Governments should play a key role in realising universal access to decarbonised technologies and practices by identifying vulnerable energy users, improving governance mechanisms, and enhancing support measures for vulnerable populations.

Recommendations:

- Identify vulnerable energy users through data collection and analysis of socio-economic challenges for net zero emissions.
- Improve governance mechanisms to harmonise climate change policies with socio-economic policies.
- Enhance support measures for vulnerable energy users to ensure equal access to clean energy through evidence-based information.

Source: Takemoto, Akio, Cros, Apolline, Suzuki, Masachika and Korwatanasakul, Upalat (2022). Supporting Vulnerable Populations in the Transition to Net Zero Emissions: Priorities for Developed Countries. UNU-IAS Policy Brief series. UNU-IAS.

SDG 11 (sustainable cities & communities)

With only 7 years remaining to achieve the SDGs, efforts at the local level are urgent. Localisation of the goals and targets has great potential to accelerate progress on the 2030 Agenda and an inclusive, sustainable, and resilient recovery from COVID-19.

Specific recommendations:

- **Multi-stakeholder partnerships:** local stakeholders have unique knowledge and capacities for developing tailored solutions to sustainable development challenges. Multi-stakeholder working groups also play a critical role in systematic SDG monitoring and evaluation at the national and subnational levels.
- **Sub-national governance:** short-term responses should be aligned with longer-term objectives by internalising the SDGs and other international frameworks. Subnational governments should adopt SDGs-related approaches to support local strategies, and accelerate digitalisation of services.

- **City finances:** COVID-19 has emphasised the importance of strengthening cities' financial resilience to navigate and recover from socioeconomic adversity. The better-equipped cities are to plan and manage their finances, the faster cities will build back better. Local policymakers and financial managers must chart an effective and sustainable financing path appropriate for their local contexts. Cities should:
 - Conduct fiscal optimisation and crisis budgeting to improve own source revenue.
 - Adapt budgeting formats and link urban planning with investments to facilitate long-term financial planning.
 - Undertake comprehensive finance reviews to inform policy and increase budget transparency and accountability.
 - Introduce e-government tools in city financial management and participatory budgeting.
 - Leverage public-private and civil society partnerships for public service provision.

Source: Okitasari, Mahesti, Kandpal, Richa and Korwatanasakul, Upalat (2022).

Managing the Impact of COVID-19 on City Finances. UNU-IAS Policy Brief series. UNU-IAS.

UNU-IAS has been advancing a model for SDGs localisation through activities in Kanazawa, Japan. The institute's Operating Unit Ishikawa/Kanazawa (OUIK) has worked closely with Kanazawa City and diverse local stakeholders to develop city-level SDGs indicators and implement a platform for public-private partnership on the SDGs, IMAGINE KANAZAWA 2030.

Annex II

UNU Vice-Rectorate in Europe (UNU-ViE), Germany

Institute Input for 2023 HLPF and ECOSOC

1. Progress, experience, lessons learned, challenges and impacts of the COVID-19 pandemic on the implementation of SDGs 6, 7, 9, 11 and 17 from the vantage point of your intergovernmental body, bearing in mind the three dimensions of sustainable development and the interlinkages across the SDGs and targets, including policy implications of their synergies and trade-offs:

The impacts of the pandemic, including lockdowns and disruptions to global supply chains have affected the pace of progress toward the Sustainable Development Goal of ensuring access to affordable, reliable, sustainable and modern energy, and a reliable water supply by 2030. Advances have been impeded particularly in the most vulnerable countries in the Global South already lagging behind. With regard to the African continent, SDGs 2, 6, and 7 are split between countries that have moderate actions toward achievement and stagnation (The Sustainable Development Goals Center for Africa and Sustainable Development Solutions Network 2020). An explanation for this specific slow progress is that, throughout the decades, the African population has developed cultural habits to live from the land. The water-energy-food nexus (WEF nexus) approach, into which UNU-ViE conducts research via its PACET division, has been utilized in the last years to analyze problems, design projects, and to develop joint policies in a holistic way, taking into consideration three interconnected sectors, namely water, energy, and food (SDGs 2, 6, and 7 respectively).

This integrated perspective of SDGs and the linkage to permissible integrative solutions can lead to more impactful and innovative ways in achieving them. The importance of an integrated approach to address water scarcity provides and ensures access to electricity while maintaining a sustainable production and giving communities access to food. Particularly in Africa, where the situation is far from ideal, this perspective is vital for the development of the continent. The approach further contributes to the achievement of the objectives of the continental development agendas (United Nations Sustainable Development Goals and the Agenda 2063 of the African Union). Indeed, the continent faces several challenges regarding the sustainable use and exploitation of resources and, at the same time, the achievement of the Sustainable Development Goals. This includes an energy sector landscape that mostly depends on conventional energy generation systems that rely on water resources, combined with the dependence of water treatment and distribution systems on energy. Additionally, the limited access to clean and sufficient water resources for drinking, agricultural, and pastoral activities, including irrigation, need to be addressed in a coordinated manner with adequate planning for

an efficient use of resources to ensure an effective and realistic achievement of the targets set by the United Nations, specifically the achievement of the SDGs 2, 6, and 7 highlighted above.

The WEF nexus approach and solutions are thus important to examine and evaluate the WEF resources in a comprehensive and holistic manner as an interconnected system between the water, energy, and food sectors rather than three independent sectors taken individually. As a result of the complexity in addressing any SDG in each context, there is a shift from adopting a siloed approach in addressing any SDG to applying solutions using an integrated approach. The application of WEF nexus technologies offers a multifaceted integrated solution with the opportunity for different African countries to address multiple SDGs and their corresponding targets. Moreover, WEF nexus technologies can be implemented in a community within a framework that responds to other needs, thus addressing other SDGs. For instance, it can be introduced on a fabric of entrepreneurship, where communities generate business models in the application of the technologies to offer goods and services from the outputs of its application, e.g., surplus energy, water generation, treatment and distribution, crop irrigation, wastewater management, value addition of farm produce, etc. Additionally, the multifaceted capabilities of WEF nexus technologies allow for incremental innovation for higher impact to communities. This is important because WEF nexus technologies provide a baseline foundational solution that communities in different African countries can adapt based on their developmental needs. As an example, a relatively new WEF nexus technology, agrivoltaics (AV) or agrophotovoltaics (APV), supports solar energy generation while minimizing the surface area loss of arable land (Schindele et al. 2020). The implementation of AV systems, a WEF nexus technology, provides an opportunity for livelihood improvement in the region with several benefits both in terms of sustainable resources utilization and management (land, water, and energy), and also the creation of an environment that stimulates socioeconomic conditions of populations. APV as a WEF nexus technology is no stranger to the challenges that introducing new innovation in the sector represents. The RETODOSSO APV-MaGa projects implemented by UNU-ViE build on the challenges the WEF nexus approach faces in the Sahel region. The implementation of the projects aims to set a solid ground for the development and adoption of the technology as an effective tool to build resilience to climate change in sahelian communities. It also aims to improve people's livelihoods by creating value to rural communities, building on an approach that ensures ownership and stakeholders involvement in the project.

3. Examples of specific actions taken to recover from the COVID-19 pandemic that also accelerate progress towards multiple SDG targets, including actions identified by your intergovernmental body, building on interlinkages and transformative pathways for achieving SDGs:

The socio-technological nature of the solutions requires the supply of technological components, mainly available outside the continent, for the setup of the APV systems. The impacts of the pandemic, such as lockdowns and the disruption to global supply chains, have affected the deployment of APV systems in Africa, including the installation and deployment of the APV systems planned within the framework of the aforementioned projects.

5. Key messages for inclusion into the Political Declaration of the September 2023 SDG Summit:

The approach to implement an AV project anywhere has to be interdisciplinary, focusing on synergy and good interconnectedness of the system's elements as main objectives. Besides the development of technological solutions, the establishment of a conducive enabling environment is an important aspect that addresses WEF nexus challenges to be considered for the sustainability of the different solutions while fostering the development of new ones particularly at regional scale. Several regions on the continent have established policy and strategic frameworks that can allow a smooth deployment of WEF solutions in a more sustainable way. This definitely represents a bridge between the technology innovation to a successful implementation and high acceptance rate within the hosting communities. Established WEF nexus institutions and policies could help to take best advantage of the shared resources, common climatic, political history, and cultural heritage among the different countries of the Sahel region. The “most suitable” setting to implement a WEF nexus technology should also include the involvement of regional institutions with the mandate to manage the water, energy, and agriculture sectors based on the different river basins authorities managing different transboundary water resources within different states in the region. Additionally, conducive policies and frameworks defining regional strategies acknowledging WEF as a priority area should be developed if not in place already, to integrate water, food, and energy planning as a strategy to address the socioeconomic targets and enhance the efficiency in the use of natural resources in the region. In addition, the development of specific policies framing the WEF nexus activities is an essential element in the development of a regional enabling environment that favors the development of WEF nexus solutions. Besides all the main targets and specific global conditions the Sustainable Development Goals aim to achieve, they also represent a complete guide to developing innovation with a cause to harness as much potential as possible. In the case of WEF nexus technologies, any innovation - no matter the size, budget, or range - could have a cascading effect in the SDGs if handled properly.

References

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Annex III

UNU Institute for Integrated Management of Material Fluxes and Resources (UNU-FLORES), Germany

Institute Input for 2023 HLPF and ECOSOC

SDG6 and partnership – Input based on the projects Smart-Water Domain & Safe Use of Wastewater in Agriculture (SUWA)

SDG 6.3 aims to improve water quality by reducing pollution, eliminating dumping and minimizing the release of hazardous chemicals and materials, halving the proportion of untreated wastewater substantially by 2030. The institutional research projects of UNU-FLORES - SMART-WaterDomain and Safe Use of Wastewater in Agriculture (SUWA) address the safe use of wastewater on an agricultural and industrial-scale and seeks for potential solutions to address growing water stress and declining water quality by considering social, environmental, and economic aspects.

The unprecedented scale and impact of the COVID-19 pandemic have caused major setbacks to the water sector to provide critical water and wastewater services due to increased residential demand and decreased non-residential (i.e., commercial, industrial, and institutional) demand. On the other hand, the pandemic has provided a greater recognition of the role of water reuse in improving water quality and reducing the risk of the spread of viruses and other pathogens to prevent the further transmission of disease. The increased use of pharmaceuticals during the pandemic has led to the role of wastewater treatment to remove these contaminants from aquatic systems, which has become an emerging environmental concern. Assessing the environmental, economic and social impacts, including health impacts, is critical to understand the prospective risks and opportunities and identifying policy options related to industrial and agricultural water reuse. The UNU-FLORES initiative on the Safe Use of Wastewater in Agriculture (SUWA) aims to support UN Member States in the development of their national capacities and strategic policy implementation actions in priority areas that promote the safe and productive use of wastewater by reducing the pressure on water resources and its contamination.

Sustainable and integrated water governance and management strategies are required to minimize the stress on natural resources and accelerate the transition to circular economy by protecting human and environmental health. Transformative steps to regulate water reuse for industrial and agricultural use have been taken in certain regions to protect human and environmental health. As an example, the European Union reviewed its Urban Wastewater Treatment Directive to improve the monitoring of health parameters in wastewater to enhance preparedness against pandemics or other major public health threats. On the other hand, in

many countries, fragmented national legal, institutional, and administrative frameworks; lack of financial, human and technical capacity; and poor data availability are still creating challenges to achieve the SDG 6 targets by 2030.

Encouraging public-private partnerships (PPPs) in the water sector can unlock the potential and help countries to access and adapt to innovative solutions and technologies. PPPs offer a promising approach to the water sector to access financial resources, tap private expertise, and promote new technologies that could optimize urban water management in industrial and agricultural settings. UNU-FLORES aims to identify the research gaps on water reuse applications in the private sector and the barriers to its adoption in the frame of public-private partnerships to build resilience, raise awareness and increase the adaptive capacity of the water sector. Data availability/accessibility seems to be the major bottleneck to assess rigorously the extent and potential of water circularity in the private sector. Discrepancies between industries-based planning for economic return (short-term) and adaptation plans for natural sustainable resource management (long term) do not create synergies for common goals. Freshwater tariffs for water use remain too low in comparison with the initial investment and operation costs for sustainable water management that industries and agriculture might have to face. Enhancing comprehension and analysis of mechanisms to facilitate PPPs can promote the circularity of water and help to reduce the dramatic impact of COVID-19 on environmental and human health.

SDG7 and SDG9 – Input based on the projects “Sustainable Transformation in Coal Regions of the Global South: Challenges from a Resource Nexus Perspective” (NEXtra Core) and “Challenges of Managing End-of-Life Electric Vehicle Batteries in the Global South” (EOL EVB-S)

The above-mentioned projects address SDGs 7 and SDG 9, and in particular the following targets:

- 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix
- 9.5: Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending
- 9.a: 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 Member States

The two projects contribute to the sustainable energy transition, and the sustainable transition to e-mobility. The NEXtra Core project assessed for four coal-producing and -exporting countries of the Global South (Colombia, Indonesia, Mozambique, South Africa) the status quo and potential pathways for a timely, just, and sustainable phaseout of coal. It concluded that a) the environmental legacies of coal mining, processing and usage created long-term environmental management challenges, but the rehabilitation of former mines may also create new opportunities for environmental conservation and regional development (e.g., in tourism); b) economic / employment alternatives are of significant relevance for a just transition and local acceptance; c) the changing geopolitical situation has strongly impacted (delayed) plans for coal phaseout. The EOL LIB-S project addresses the implications of exporting used hybrid and battery electric vehicles with lithium-ion batteries (LIBs) from the Global North to the Global South. Even though used car trade to the Global South is still dominated by vehicles with internal combustion engines, the shares of hybrid and electric vehicles are increasing, causing significant challenges for importing countries which lack facilities for the safe recycling or disposal of end-of-life (EOL) batteries.

Key areas of successful transformative action	Key areas where support is needed
<ul style="list-style-type: none"> Experts from coal-producing countries of the Global South have been brought together to develop strategies for a timely, just and sustainable phaseout of coal 	<ul style="list-style-type: none"> Rapidly and substantially increasing numbers of EOL LIBs from electric vehicles are a growing risk for environment and health in the Global South, increasing the danger that sustainable and locally emission-free transportation in the Global North comes at the price of growing electronic waste problems in the Global South The geopolitical conflict between Russia and Ukraine, and subsequent Western bans on fossil fuels from Russia have had a strong effect on coal exporting countries in the Global South, many of which have at least temporarily increased production levels

Impacts of COVID-19 and current geopolitical conflicts

COVID-19 initially had a positive effect on coal phaseout as global energy consumption initially decreased. However, the geopolitical conflict between Russia and Ukraine had unforeseen implications for global coal phaseout, particularly in coal exporting countries of the Global South.

Several countries, including Colombia, Indonesia and South Africa have increased their coal exports, particularly to Europe, to compensate for fossil fuel imports from Russia. This has not only slowed down phaseout plans, but even lead to production increases, and has put countries like Germany (which previously advocated for faster coal phaseout but currently happily accepts greater coal imports) into a moral dilemma.

Situation at the mid-point of SDG implementation

Even though the share of renewable energy has increased in many countries of the world, the pace has not been fast enough. The fact that the world has just experienced a peak in coal consumption, and that global CO₂ emissions from fossil fuels have reached a record high clearly indicate that the world is off-track with regard to goal 7 and the Paris Agreement goals. At the same time, the transition to electric mobility has the potential to significantly decrease emissions from the traffic sector, but potentially at the price of new environmental problems, including the management of EOL batteries. Strategies to handle this emerging waste stream, at its full scale, must be developed rapidly in order to avoid a negative environmental footprint and public health impacts, particularly in countries of the Global South.

Policy recommendations and potential key messages

1. The world is off-track with regard to the goals of the Paris Agreement and SDG7; CO₂ emissions from fossil fuels have reached a record high in 2022. Strong efforts are needed to accelerate the phaseout of fossil fuels in a just and sustainable manner.
2. The transition to electric mobility urgently requires an increase in the technical and human resource capacities for recycling EOL batteries, which might otherwise turn a “green” technology unsustainable, particularly in countries of the Global South.

SDG6 and SDG17 – Input based on the projects “Global Water and Climate Adaptation Centre – Aachen, Bangkok, Chennai, Dresden” (ABCD) and “Nexus Approaches to Address Water Security and Climate Change Adaptation” (NASCENT)

The above-mentioned projects address SDGs 6 and SDG 17, and in particular the following targets:

- 6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate
- Target 6.6: By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes
- Target 6.a: By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and

programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies

- Target 6.b: Support and strengthen the participation of local communities in improving water and sanitation management
- 17.6: Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism

The projects have their principal focus on water security in the context of climate adaptation; they consider climate change as a reality that needs to be addressed by science-based adaptation measures that consider water in an IWRM / Sustainability Nexus perspective (here understood as the interlinkages between several environmental resources, including primary resources like water, soil and air, but also secondary resources like food, and the social, economic and political systems of countries or regions). In particular, the projects connect academic stakeholders from the Global South (particularly South and Southeast Asia, but also Africa) and the Global North (Germany, Japan, and South Korea) with the goals to jointly train students, exchange staff and conduct research. The research is applied rather than fundamental, and connects to the needs of local communities while also taking traditional knowledge and acceptance issues into consideration. Partners from the Global South are encouraged and enabled for a South-South cooperation. Knowledge transfers occur in all directions (not only North to South but also South to North).

Key areas of successful transformative action	Key areas where support is needed
<ul style="list-style-type: none"> • Increase in international research collaboration in the fields of water security and climate adaptation, including the involvement of local communities, industry and political stakeholders • Creation of transnational learning opportunities in our projects but also well beyond, facilitating the access to knowledge on water security and climate adaptation 	<ul style="list-style-type: none"> • Best practices in climate adaptation are not well documented in formal literature / reports, but would be of great help for facilitating replication • Resource Nexus / Sustainability Nexus approaches are still in their infancy in the real world, but have significant potential for creating synergies between climate/water and other environmental goals while minimizing unwanted trade-offs

Impacts of COVID-19

COVID-19 has temporarily diverted public and political attention from water security and climate adaptation challenges. At the same time, increasing frequencies and intensities of hydroclimatic extremes, including compound extremes (i.e., the co-occurrence of several extremes at the same time or in rapid succession) mandate timely adaptation strategies (that ideally have co-benefits for climate change mitigation).

Situation at the mid-point of SDG implementation

Integrated approaches to water security and climate adaptation have continued advancing both in science and policy. Nevertheless, their high complexity remains challenging, particularly in data-scarce regions in which interdependencies between different environmental resources are sometimes not fully understood. A growing recognition of the need for involving local communities is a positive trend, as are enhancement in North-South and South-South collaborations.

Policy recommendations and potential key messages

1. A systematic compilation and documentation of best practices in climate adaptation for advancing water security is an important need that no one can address better than the UN system.
2. In the field of climate adaptation, local knowledge plays a significant role, but it is often poorly documented and not considered in scientific assessments. Both should be changed in order to provide a larger body of evidence, both for successful and unsuccessful adaptation strategies.

Annex IV

UNU Institute for Environment and Human Security (UNU-EHS), Germany

Institute Input for 2023 HLPF and ECOSOC

1. Progress, experience, lessons learned, challenges and impacts of the COVID-19 pandemic on the implementation of SDGs 6, 7, 9, 11 and 17 from the vantage point of your intergovernmental body, bearing in mind the three dimensions of sustainable development and the interlinkages across the SDGs and targets, including policy implications of their synergies and trade-offs:

Urban infrastructures, in particular healthcare, but also transport, clean water and other critical services, have been put under severe stress. Here, too, the pandemic has shown how fragile some supposedly safe utilities are and how they are interrelated, with the risk to reinforce and thereby multiply negative impacts. In addition, particularly healthcare services in densely populated areas as most cities are could hardly cope with multiple crisis, such as a flood or heatwave on top of the pandemic, preparedness was hardly existent as this seemed an unimaginable scenario (SDG 11.2, 11.b, link to SDG 3, SDG 6, SDG 9 and Sendai Framework)

COVID-19 spotlighted the interconnectedness of systems and risks. Particularly in the urban areas, the cascading and systemic nature of risks underlined the need to 1) have a comprehensive and multi-dimensional understanding of all related factors and 2) prepare in advance. Such preparation should not only consider existing risk and vulnerability drivers but also emerging factors. Particular attention should be paid to carefully examine the likely impacts across the system, beyond the direct impacts themselves. For example, closing of schools during COVID-19 not only hindered access to education (direct impact) but often also the access to nutrition and safety. Furthermore, it limited the anyway stretched workforce in critical services as parents had to stay home to attend their children (SDG 11.5, 11.b, link to SDG 3 and Sendai Framework)

The pandemic also has highlighted the fragility of international and cross-border supply chains and in turn exposed the value of local value chains, urban gardens, and other community-based initiatives, revealing their importance for decent urban livelihoods (addressing SDG 11.1., 11.2 11.3). this also directly highlights the link to environmental protection and nature-based solutions (SDG 11.7 and link to SDG 15 and SDG17)

COVID-19 inhibited significantly exchange and interaction between urban actors and has put additional burden on anyway vulnerable parts of the urban population. It also has particularly impacted those living in smaller flats, communities with less access to open spaces or leisure activities, with significant health impacts. Additionally, mental health became a major concern,

exacerbated by little or no access to places with a high quality of stay, social interaction, or cultural activities (addressing SDG 11.1, 11.4 and 11.5).

In this globalized world as COVID-19 has shown, the impacts of risks can be felt without direct exposure, as consequences of the pandemic were even felt in areas with low infection risk. Therefore, it is recommended to strengthen the global architecture of risk assessment to consider and prepare for any such eventuality in future, considering international, national, and municipal/urban scales (SDG 11.5, 11.a, 11.b, link to SDG 17 and Sendai Framework).

The process of urbanization in itself can aggravate or diminish vulnerability and exposure to different kinds of risks. Particular attention should be paid to ensure that the process of urbanization adequately considers the near- and long-term exposure and vulnerability trends – including such induced or exacerbated by climate change – and projects of both human settlements and the inhabitants. Hence decisions on land-use, infrastructure or building materials, to name just a few, should be vetted against impacts on exposure and vulnerability levels (SDG 11.3, 11.5, 11.6, link to SDG 13, Paris Agreement and Sendai Framework).

2. Three key areas where transformative actions for accelerated progress have been successful, and three key areas where support is most urgently needed, with regard to the cluster of SDGs under review in July 2023:

Significant progress has been witnessed in reducing poverty and enhancing coping capacity of vulnerable communities, at the same time, urbanization in exposed areas often compromised or even diminished any such progress made if not managed. The shift to renewable energies and decentralized grids with a potential for being managed by and for urban communities has accelerated. Thereby, cleaner sources of energy can not only reduce emissions and air pollution, but also contribute to better and fairer access of supplies.

The increasing impacts of climate change on cities hamper or even roll back the progress made on SDG11, it is recommended to consider present and emerging impacts of climate change on cities, peri-urban areas and regions to prepare in a timely and resource efficient manner. Many of the drivers that negatively impact the achievement of SDG11, also aggravate the impacts of climate change and a cohesive approach to address all such factors is highly recommended.

Stronger recognition of interlinkages between availability and accessibility of urban services and sustainable livelihoods for all urban inhabitant groups is needed, including by the consideration in transformative governance approaches to build lasting change and gear cities towards a just transition.

3. Examples of specific actions taken to recover from the COVID-19 pandemic that also accelerate progress towards multiple SDG targets, including actions identified by your intergovernmental body, building on interlinkages and transformative pathways for achieving SDGs:

COVID-19 has demonstrated not only the limitations and, in some cases, the inertia of government assistance, but also the value of community self-help. While this should not be seen as a substitute for governmental safety nets, there should be a recognition of neighbourhood approaches as key success factor in supporting people and communities. Particularly in cities often community ties aren't well developed, in places where strong communities did exist, support could often kick in faster than elsewhere. On top of that, such community-based approaches have the power to be sustained post-pandemic and to serve as starting point for further initiatives to empower citizens in line with the leave no one behind approach of the Agenda 2030. One example is the "Mesa Salud" initiated in the informal settlement of Villa 20 in Buenos Aires with the aim to support the local population and limit the spread of the disease, by means of health care networks, food security, communication, hygiene and sanitation practices. Thereby a larger urban transformation towards sustainability can be initiated and accelerated and multiple SDGs can be supported.

Community involvement in addressing COVID-19 in certain parts of the world also showcases the immense potential to co-create and collaborate with the local community, citizens groups and private actors to upscale efforts to achieve SDGs, particularly SDG11, which can lead to transformative actions. The enormity of challenges in achieving the SDGs while addressing climate change demands that top-down and hierarchical models of decision making should proactively consider delegation and devolution of decision making, including financial allocations and resource management, particularly at the local level. New and innovative forms of formal as well as informal governance have emerged during COVID and could inform and inspire more participatory future urban decision-making.

The role of technology in ensuring effective and rapid communication, collaboration and resource allocation was witnessed in many parts of the world during COVID-19. It is highly recommended that a proactive approach is adopted to leverage this potential, particularly in very dynamic times. At the same time, particular attention should be paid to avert, reduce or minimize any possible miscommunication particularly through emerging channels of information dissemination including social media. A well-structured, transparent and collaborative network of communication should be considered to augment such efforts.

4. Assessment of the situation in the mid-point of the implementation of the 2030 Agenda and the SDGs, against the background of the COVID-19 pandemic and within the respective areas



addressed by your intergovernmental body, and policy recommendations, commitments and cooperation measures for promoting a sustainable, resilient and inclusive recovery from the pandemic while advancing the full implementation of the 2030 Agenda:

COVID-19 has exposed and often exacerbated existing inequalities. the achievement of many goals of the different SDG, including SDG11, has been stalled or even reversed. at the same time, however, it has become clear how important and interrelated the individual goals, as well as the other international frameworks, are.

In urban areas, a stronger perspective on the interlinked character of the SDG11 goals is needed, to identify precisely the measures that will help achieve several goals.

5. Key messages for inclusion into the Political Declaration of the September 2023 SDG Summit:

Our understanding as well as practices to reduce and manage risks must consider the cascading and systemic nature of risks. Additionally, any such planning should not only consider the near term but as well prepare for the long term based on the latest scientific information.

Increasing inequality and marginalization are of grave concern, additional efforts should be made to address these in a timely and proactive manner.

Capacity augmentation of different actors, particularly at the local (urban) level is pertinent to ensure that any unfortunate events like COVID-19 in future are adequately prepared for and dealt with in timely manner across scales.

Digitalization is a very potent tool to accelerate the achievement of SDGs and priority should be given to ensure adequate framework and resources are made available in a timely and sustainable manner to maximize such benefits. Additional attention should be given to ensure that it does abate existing inequalities and doesn't create new ones while the rebound effects of digitalization should be adequately and proactively addressed as well.

An inclusive recovery can only be achieved if measures and policies are commonly agreed and at best co-developed by all actors concerned. To do so, trust-building is an essential part. However, this cannot be developed ad hoc, but once built it can serve as a sustainable core for strong coalitions.