Issue-based Coalition on Environment and Climate Change

MEASURES TO GREEN THE POST-PANDEMIC RECOVERY

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INTRODUCTION

The COVID-19 pandemic has been severely affecting people's lives and health. It has been having unprecedented economic and social consequences for all the countries. Countries have responded with concerted efforts to shore up public health systems and social and economic response measures. The spread of COVID-19 has, however, also demonstrated the consequences of a lack of resilience and preparedness to deal with such a pandemic. Climate change, water pollution and the drivers of biodiversity loss, such as deforestation, habitat loss and the illegal wildlife trade, may increase the risk of further pandemics, or outbreaks of vector-borne or water-borne infections, while adding to a complex risk environment through potential cascading impacts to the systemic consequences of a pandemic crisis.

Therefore, both short-term and longer-term measures in countries' recovery plans should aim at delivering human rights, economic prosperity, decent jobs and wider well-being, along with an effort to address pressing environmental challenges and improve the environmental health and resilience of societies. There are several key arguments why governments should use this unique opportunity to focus on the transformation to low emission, resource efficient, resilient and environmentally sustainable socioeconomic development:

- The performance and resilience of our socioeconomic systems depend on the health of the natural environment and ecosystems. Once the COVID-19 crisis is over, we cannot return to business-as-usual practices that increase emissions and maintain pressure on wildlife and biodiversity.
- People have a right to a safe, clean, healthy and sustainable environment upon which we all depend for our health and wellbeing.
- Measures to promote environmental sustainability and resilience can create opportunities for job-rich development and improved well-being.

United Nations Resident Coordinators based in the countries of Europe and Central Asia have noted that most countries are prioritizing economic recovery during the post COVID-19 period and that environmental perspectives are often ignored. They have requested the Issue-based Coalition on Environment and Climate Change (IBC) to provide guidance and tools for assisting countries in integrating environmental and climate change issues into their recovery strategies and supporting a "building back better" approach – a green recovery. The IBC was established in March 2020 to promote coordinated support to all member States in Europe and Central Asia in their implementation of the 2030 Agenda and to support Resident Coordinators and United Nations Country Teams on environmental and climate change issues. Currently 18 United Nations agencies, funds and programmes are members of the Coalition.[1] The IBC is co-chaired by UNECE, UNEP and UNESCO.

As a follow up to this request, the IBC identified a set of recommendations for pathways for a more inclusive, environmentally sustainable and resilient COVID-19 recovery. Making use of the diverse expertise of the 18 IBC member organizations, the recommendations – issued in August 2020 – provided

[1] As of December 2020, the IBC members are FAO, ILO, IOM, ITU, OHCHR, UN Habitat, UN Women, UNDP, UNDRR, UNECE, UNEP, UNESCO, UNFCCC, UNICEF, UNOPS, WFP, WHO and WMO.

basic guidance to Resident Coordinators, Country Teams and other partners working on recovery plans and assessments of the socioeconomic impacts of the pandemic.[2] The earlier generic guidance on how to build back better in line with environmental and climate sustainability is complemented by this compendium of 20 practical measures to implement the recommendations in recovery plans. Each measure is accompanied by a description, its benefits, a case study and related Sustainable Development Goal (SDG) targets, with reference to measure-relevant United Nations agencies, funds and programmes and some guidance materials. Elaboration of the compendium is complementary to many other activities carried out and resources prepared by the IBC members to support governments in coping with the pandemic and in designing inclusive and sustainable post-pandemic development strategies.[3]

Measures are classified in the following categories (pictograms below): biodiversity action, climate action, housing and buildings, industry, infrastructure, economic instruments (including SMEs), fiscal measures, agriculture and food security, tourism, transport and mobility, water, air and waste management. Affiliation of measures with categories is not prescriptive since topics addressed by measures and categories are interlinked.

In addition, the measures may be categorized according to the headings in the set of recommendations for pathways for a more inclusive, environmentally sustainable and resilient COVID-19 recovery, as they are intended to give practical help with the implementation of those recommendations:

Waste management and circularity	Measure 9 & 14
Environmental sustainability and green economy	Measure 5 & 19
Sustainable consumption and production	Measure 7 & 17
Clean energy transition	Measures 1, 2, 10, 11 & 12
Nature-based solutions	Measure 4, 6, 8 & 13
Natural resources management	Measure 15
Disaster risk reduction and resilience building	Measure 3, 21, 22 & 23
Governance and risk-informed decision-making	Measure 18 & 20
Transboundary, regional and global cooperation	Measure 16

The list of measures is far from comprehensive. Instead, it provides a range of options for countries to select from, considering their specific country conditions, priority areas and potential for improvement. The common denominator of all the listed measures is that they provide the opportunity for countries to transition to a new social and economic model that is climate neutral, resilient, sustainable and inclusive.

Despite the selected measures focusing on different economic sectors and different aspects of environment and climate change, a certain level of generalization and simplification suggests that governments should in principle take the following steps in order to implement them:

- Establishing favourable strategic and policy frameworks
- Setting up or improving relevant legal, regulatory and institutional frameworks

[2] See: https://unece.org/fileadmin/DAM/RCM_Website/IBCs/IBC_Environment/Final_IBC_Summary_recommendations_COVID-19_Recovery.pdf

[3] More information on activities and a list of resources produced by the IBC members is available at https://unece.org/issue-based-coalition-environment-and-climate-change

- Introducing stimulating fiscal measures and disabling harmful ones
- Providing and stimulating investments (including from the private sector) into R&D, development and application of new technologies and approaches, and in building relevant skills
- Setting up effective monitoring and evaluation systems to measure impacts of implemented measures, also by improving relevant data collection and analysis
- Involving key stakeholders, including employers' and workers' organizations, and the public (affected and interested) in the design, implementation and impact assessment or monitoring of concrete measures
- Building public awareness and introducing incentives for the public to drive demand for "green" polices, approaches, products and services

All the steps taken should also be oriented by an "equity and human rights perspective", which is indispensable to reach the most vulnerable and marginalized and ensure that we can deliver on the promise of the Sustainable Development Goals to leave no one behind.

CATEGORIES

Fiscal measures 

Economic instruments 

Tourism 

Climate action 

Biodiversity action 

Waste management 

Agriculture and food security 

Industry 

Infrastructure 

Transport and mobility 

Housing and buildings 

Water 

Air quality 

ACRONYMS AND ABBREVIATIONS

CBD	Convention on Biological Diversity
COVID-19	The disease caused by the novel coronavirus SARS-CoV2
EBRD	European bank for Reconstruction and Development
EC	European Commission
ECA	Europe and Central Asia
EU	European Union
GDP	Gross domestic product
GEF	Global Environment Facility
GHG	Greenhouse gas
GPP	Green public procurement
IBC	Issue-based coalition
IRENA	International Renewable Energy Agency
MSME	Micro, small and medium-sized enterprises
NbS	Nature-based solution
NGO	Non-governmental organization
PM2.5	Fine particulate matter (particles that have diameter less than 2.5 micrometres)
SPP	Sustainable public procurement
TEEB	The Economics of Ecosystems and Biodiversity
UNCTAD	United Nations Conference in Trade and Development
UNDRR	United Nations Office for Disaster Risk Reduction
UNIDO	United Nations Industrial Development Organization
UNITAR	United Nations Institute for Training and Research
UNWTO	United Nations World Tourism Organization
USAID	United States Agency for International Development
WSPs	Water safety plans
WTO	World Trade Organization

Members of the Issue-based Coalition on Environment and Climate Change are not listed above.

CATEGORY: **Housing and buildings, Climate action**

MEASURE 1

Increase energy efficiency of buildings, including schools and hospitals, by retrofitting existing buildings, insulation and replacement of boilers, lighting and household appliances with energy-efficient substitutes and other interventions

BENEFITS

Activities to increase the energy efficiency of buildings are cost-effective, with a pay-back period of 15-20 years for full retrofitting of a home or, for example, only 3-4 years for spraying foam insulation in new buildings. Such activities are labour intensive, geographically spread and can foster the development of local micro, small and medium-sized enterprises (MSMEs). They also lead to reduced greenhouse gas emissions when fossil fuels are used for heating or electricity generation, also providing opportunities to use generated electricity for other purposes. Standards are well-defined and both implementation and effectiveness are measurable. Better living conditions will also relieve some of the most burdensome and unhealthy aspects of women's daily lives and expand the development options available to women, their families and their communities.

BRIEF DESCRIPTION

Mandatory energy efficiency requirements, which are increasingly applied in countries of Europe and Central Asia, provide a great opportunity for adopting, implementing and enforcing energy efficiency standards and promoting the application of energy efficiency technologies in the building sector, including a sustainable intelligent building approach. To pursue such developments, countries, depending on their needs, can implement measures focusing on the following areas: (i) *Legislative and regulatory* framework for energy efficiency in the building sector, including institutional capacity development and good coordination between government agencies, municipalities and the private sector; (ii) *Effective building operation* applying solutions and tools such as energy audits, capable residential management companies, well-functioning Buildings Certificate Programmes and access to finance for energy efficiency upgrades; (iii) *Awareness raising, capacity building and behaviour change* through training and educational programmes for construction professionals, maintenance specialists, inhabitants of residential buildings and users of public ones; (iv) *Technical measures including smart and affordable technologies* ranging from insulation and glazing, space heating, solar collector systems, to smart and innovative approaches (e.g., smart metering, sensors, Internet of Things, innovative construction materials and, for new construction, sustainable intelligent buildings as recommended by ITU); (v) *Financial mechanisms* such as energy efficiency oriented loans or green credit lines by local or international banks, subsidies, loans or price changes managed by public institutions and involving private investors (ESCOs,[4] energy efficiency equipment manufacturers and suppliers). Ideally improved energy efficiency is coupled with renewable energy solutions, especially in critical public buidlings such as **schools and hospitals**.[5]

[4] ESCO is an energy service company that offers services that may include implementing energy-efficiency projects (and also renewable energy projects) and in many cases on a turn-key basis. One of the key features is that the remuneration of ESCOs is directly tied to the energy savings achieved.

[5] The text in this section is adapted from the UNECE *Compendium of best practices on standards and technologies for energy efficiency in buildings in the UNECE region*, 2019, available at https://unece.org/sustainable-energyenergy-efficiency/energy-efficiency-buildings

CASE STUDY

ESCO model applied to renovate public hospitals while creating jobs in Croatia[6]

Mechanism of public-private partnership between the Environmental Protection and Energy Efficiency Fund (EPEEF) and an Energy Service Company (ESCO)[7] was applied to improve energy efficiency and saving energy-related costs of the public hospital in Karlovac. EPEEF financed 35% of eligible costs and the ESCO invested 65%, taking the technical and economic risks so the Energy Service Client (ESC), the hospital, does not have additional costs. ESC is obliged to pay compensation to the ESCO during the 14-year contract period. The payment of services is based on verifiable savings (service charge being less than savings). The number of applied technical measures (roof repair, boiler room sanitation, energy efficient lighting, deployment of renewable energy sources) resulted in 56% energy consumption reduction and a reduction in CO_2 emissions by 58%, compared to a baseline. This and another project (hospital renovation in Split) either created or maintained jobs for more than 500 people and involved more than 30 local companies per project. Overall, the ESCO model has enabled an improvement in energy efficiency in public buildings with no additional spending from the State budget.

SDG TARGETS

7.3: Double the rate of improvement in energy efficiency

7.a: Facilitate access to clean energy research, technology and investments

11.1: Ensure access for all to adequate, safe and affordable housing

RESOURCES

UNDP supports energy efficiency in households, public and private facilities and buildings, and in industry. https://www.undp.org/content/undp/en/home/2030-agenda-for-sustainable-development/planet/sustainable-energy/energy-efficiency.html

UNECE: supports application of energy efficiency standards and technologies in buildings. https://unece.org/sustainable-energyenergy-efficiency/energy-efficiency-buildings

UNEP supports energy efficiency in transport, buildings, lighting, district energy and appliance sectors. https://www.unenvironment.org/explore-topics/energy/what-we-do/energy-efficiency

UN-Habitat supports review of governments' policies and legislation affecting affordable housing provision. https://unhabitat.org/topic/energy

ITU offers a recommendation on sustainable and intelligent building services: https://www.itu.int/rec/T-REC-L.1370-201811-I; a second recommendation provides a framework for building owners, managers and operators to assess, score and improve the sustainability performance of office buildings: https://www.itu.int/rec/T-REC-L.1371-202006-I/en

UNDRR is exploring risk financing and resilient infrastructure in cities in Europe, under the scope of the Making Cities Resilient 2030 initiative. https://mcr2030.undrr.org/

WHO has recently issued Guidance for Climate Resilient and Environmentally Sustainable Health Care Facilities: https://www.who.int/publications/i/item/climate-resilient-and-environmentally-sustainable-health-care-facilities

[6] UNECE: *Compendium of best practices on standards and technologies for energy efficiency in buildings in the UNECE region* (2019), Geneva

[7] https://renovate-europe.eu/wp-content/uploads/2016/10/D_Bencic_ESCO-model-in-Croatia-final-final.pdf

CATEGORY: **Economic instruments, Climate action, Industry**

MEASURE 2

Support to MSMEs in delivering energy-efficient products and in providing renewable energy technologies and equipment

BENEFITS

Investing in energy efficiency and renewable energy has positive effects on GDP and employment, improves human well-being and overall welfare, and reduces pollution and GHG emissions. Studies conducted within the EU identify a positive effect of energy efficiency on GDP ranging from 0.3% to 1.3%.[8] Doubling the share of renewables in the global energy mix increases global GDP by up to 1.1% in 2030, equivalent to US$ 1.3 trillion. Direct and indirect employment in the renewable energy sector could reach 24.4 million people in 2030 (it was 7.7 million in 2014).[9] Tackling energy demand and energy sources have a potential business value in 2030 of over US$ 4.3 trillion in current prices.[10]

BRIEF DESCRIPTION

The trends mentioned above present business opportunities for MSMEs, considered to be well placed in the distribution, installation, operations and maintenance of technologies and equipment. A report by the Climate and Development Knowledge Network estimates that the credit gap for MSMEs providing climate technologies is approximately US$4-5 billion across developing countries.[19] Access to climate finance is still a challenge for MSMEs due to lack of awareness, lack of an enabling environment and the limited availability of financial products for greening activities and climate technology. The importance of switching to clean energy is demonstrated by 164 countries having set their renewable energy targets. Governments can apply a range of measures to support and encourage MSMEs in delivering energy-efficient products and in providing renewable energy technologies. They may adopt legislation and policies for clean and green energy; apply financial incentives by reducing energy taxes or setting tax rates on sustainable investments; encourage (local) banks to provide funding through grants, low- or no-interest loans, or green credit lines to MSMEs working on low-carbon technologies and in the renewable energy sector; facilitate establishment of associations supporting members in finding vendors or new customers; facilitate access to funding from international development organizations and funds, such as the Climate Development Fund (CDF), Green Climate Fund (GCF) or Renewable Energy and Energy Efficiency Partnership (REEEP), or linking them with multinational enterprises that can invest in MSMEs in order to gain access to new markets.

CASE STUDY

Greencubator: Fostering green entrepreneurship and innovation in Ukraine[11]

In 2016, Ukraine launched a range of reforms in the energy sector, leveraged by the financial assistance of international financial institutions. Energy subsidies and gas consumption were cut significantly, but the energy supply is still dominated by fossil fuels. At the same time, obsolete nuclear and coal infrastructure

[8] https://ec.europa.eu/energy/sites/ener/files/documents/CE_EE_Jobs_main%2018Nov2015.pdf
[9] https://www.irena.org/documentdownloads/publications/irena_measuring-the-economics_2016.pdf
[10] https://sustainabledevelopment.un.org/content/documents/25851MSMEs_and_SDGs_Final3120.pdf
[11] https://library.fes.de/pdf-files/id-moe/14922.pdf?fbclid=IwAR0uzXxCq9Y2Sk2zXjc1LFrtuP-0oqQeQOMUTX1Gr39Ntx XrSiflvpONk2U

that needs to be decommissioned provides an opportunity to phase out fossil fuel and nuclear power generation and scale up renewable energy. According to IRENA,[12] Ukraine has a large wind and solar potential for power generation. This was the setting for Roman Zinchenko to learn about the inefficiency of the Ukrainian energy sector when renovating his country house. Together with his brother Andrij and with the support of a USAID grant, he organized a first energy camp, an open-air countryside event, fully powered by renewable energy technologies. The event became a meeting point for green energy innovators and enthusiasts, students, investors and journalists. Building on this success, the Zinchenko brothers founded the Ukrainian NGO Greencubator, a platform for connecting energy talents. Its annual event now includes a hackathon, a competition for innovative start-up ideas and their implementation. In 2016, Greencubator started managing the Climate Innovation Voucher Programme, implemented by EBRD and financed by the EU Neighbourhood Investment Facility. The programme, with funding of EUR 1 million for 2017–2018 financed about 20 companies, offering a range of solutions, including renewable energy, off-grid solutions, sustainable mobility, sustainable agriculture, smart homes and resource efficiency. As a next step, Zinchenko wants his NGO to become a hub for climate and energy innovations in Eastern and Central Europe.

SDG TARGETS

7.2: Increase substantially the share of renewable energy

7.3: Double the rate of improvement in energy efficiency

7.a: Facilitate access to clean energy research, technology and investments

RESOURCES

IRENA: Supports countries in transition to sustainable energy, serves as the platform for international cooperation, a centre of excellence, and a repository of policy, technology, resource and financial knowledge on renewable energy. https://www.irena.org/aboutirena

Sustainable Energy for All (SEforALL): Works with leaders in government, the private sector and civil society to drive action toward achievement of Sustainable Development Goal 7 (SDG7). https://www.seforall.org/

UNECE: Is implementing the "Global Initiative towards post-Covid-19 resurgence of the MSME sector" and has developed the *Guidelines and best practices for micro-, small and medium enterprises in delivering energy-efficient products and in providing renewable energy equipment* (2020), available at https://unece.org/sustainable-energy/energy-efficiency

UNEP: supports activities in the area of renewable energy, energy efficiency, gender and sustainable transport. https://www.unenvironment.org/explore-topics/energy/about-energy

UNDP: helps 111 countries in transitioning from the use of finite fossil fuels and towards clean, renewable, affordable sources of energy. https://www.undp.org/content/undp/en/home/six-signature-solutions.html

ILO conducts research on employment impacts of energy policies and assists entrepreneurship and value chain development in the renewable energy sector (https://www.ilo.org/global/topics/green-jobs/lang--en/index.htm). It also supports SMEs in resource and energy efficiency improvements https://www.ilo.org/empent/Projects/score/lang--en/index.htm.

[12] International Renewable Energy Agency

CATEGORY: **Biodiversity action**

MEASURE 3

Integrating biodiversity into the COVID-19 recovery plans to minimize risks of future pandemics, strengthen overall economic resilience and support human and animal well-being

BENEFITS

Biodiversity loss is a key driver of emerging infectious diseases and poses other risks to businesses, society and the global economy. Investing in biodiversity as part of the response to the pandemic can help to minimize risks, while providing jobs and an economic stimulus. Studies estimate that spending $260 billion per year over 10 years, on measures such as combatting deforestation, improving management of global wildlife trade and improving disease surveillance in wild and domestic animals, would reduce the risk of another pandemic. This investment is equivalent to 2% of the estimated cost of the COVID-19 pandemic.[13] An analysis of 163 industry sectors and their supply chains found that US$44 trillion of global value added (over half of the world's GDP) is dependent on nature and its services. Around 1.2 billion jobs globally directly depend on ecosystem services.[14] Measures to protect biodiversity should also aim to avoid violation of local and international laws, and immense and needless suffering to animals.

BRIEF DESCRIPTION

Biodiversity underpins the ecosystem services upon which economy and lives depend: the provision of food, fresh water, medicine, timber and fuelwood; regulation of climate and protection from extreme weather events; primary production, soil formation, etc. Yet it is being excessively destroyed, with 25% of all plant and animal species now threatened with extinction. It is therefore inevitable that governments integrate in their COVID-19 policy response (and beyond) the biodiversity measures such as: maintain or strengthen regulation on land use, wildlife trade and pollution; attach environmental conditionality to bailouts to drive sustainability improvements; screen and monitor stimulus measures for their biodiversity impacts; set biodiversity spending targets for COVID-19 stimulus measures and recovery plans, including for environment-related R&D; promote jobs in biodiversity conservation, sustainable use and restoration; engage businesses in a biodiversity-positive recovery; reform biodiversity-harmful subsidies; scale up economic incentives for biodiversity; adopt and strengthen the One Health approach;[15] and develop, adopt and implement an ambitious post-2020 global biodiversity framework. For the measures to be sustainable, indigenous peoples and local communities need to be involved in biodiversity conservation and management of natural resources and women's rights and access to and control over biodiversity[16] and natural resources must be ensured.[17]

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[13] OECD; Biodiversity and the economic response to COVID-19: Ensuring a green and resilient recovery; 2020. http://www.oecd.org/coronavirus/policy-responses/biodiversity-and-the-economic-response-to-covid-19-ensuring-a-green-and-resilient-recovery-d98b5a09/

[14] ILO; World Employment and Social Outlook 2018: Greening with jobs; 2018. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---ubl/documents/publication/wcms_628654.pdf

[15] For explanation of the One Health approach go to https://www.who.int/news-room/q-a-detail/one-health

[16] More information on women's role in biodiversity protection is available in the Training manual on Gender and Climate Change https://www.preventionweb.net/files/9526_trainingofgenderlow.pdf

[17] The text in this section is largely copied from the OECD source referred to above.

CASE STUDY

Good practice examples of integrating biodiversity into COVID-19 response and recovery plans

Finland – The amount of EUR 5.5 billion for the package of economic recovery measures includes EUR 53 million (US$62 million) for projects involving green areas, water services and forest conservation and EUR 13.1 million to rehabilitate nature sites and develop nature-based tourism. *United Kingdom* - has launched a GBP 40 million (US$51 million) "green recovery challenge fund", to help protect 2,000 jobs and create 3,000 new short- and long-term jobs in tree planting, habitat restoration and green space creation. *Austria* - has committed EUR 350 million to research projects that enhance adaptation of forests to climate change, including by protecting and enhancing biodiversity and increasing natural forest protected areas.

ECOserve[18] programme in Azerbaijan[19]

Since 2016, following the national Strategic Road Map for the Production and Processing of Agricultural Products, the country has been improving the agricultural sector to diversify its economy. Sector intensification and unsustainable practices cause fertile soil degradation, leading to a decline in agricultural productivity and restricting the improvement of production capacity. ECOserve supports the government in strengthening its agricultural sector through the incorporation of legal acts and procedures that ensure the sustainable use of natural resources and agricultural inputs; the development of a new data-layer on the status of natural resources (e.g., biodiversity on agricultural land, soil quality, water demand and supply); testing alternative measures and practices in the pilot area; delivering training on sustainable, biodiversity-friendly and climate-adapted agriculture, illustrating the role and tasks of the female rural population; etc.

SDG TARGETS

15.5: Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species

15.7: Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products

15.9: By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts

RESOURCES

UNEP: Fosters the transition towards integrated ecosystem management for ecosystems meeting both ecological and human needs. https://www.unep.org/explore-topics/ecosystems

UNDP: Is proactively addressing biodiversity loss and ecosystem degradation to maintain natural capital intact in partner countries. https://www.undp.org/content/undp/en/home/2030-genda-for-sustainable-development/planet/environment-and-natural-capital/biodiversity-and-ecosystems-management.html

ILO: Produces guidance and advises countries on employment-intensive investments and public employment programmes that support environmental restoration and biodiversity goals. https://www.ilo.org/global/topics/employment-intensive-investment/themes/green-works/lang--en/index.htm

[18] ECOserve, "Management of natural resources and safeguarding of ecosystem services for sustainable rural development in the South Caucasus", is jointly implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH and partners in Armenia, Azerbaijan and Georgia. https://biodivers-southcaucasus.org/#7

[19] https://biodivers-southcaucasus.org/countries/azerbaijan

CATEGORY: **Biodiversity action; Tourism**

MEASURE 4

Establishment and management of biosphere reserves through an integrated approach to nature conservation and sustainable development

BENEFITS

Biosphere reserves present innovative approaches to living and working in harmony with nature by supporting local economic development based on conservation and sustainable use of biodiversity. Communities living in biosphere reserves gain economic benefits through activities such as nature-based tourism, local food production and local gastronomy, and utilization of renewable energy sources. These activities have a potential to gain momentum in times when international tourism, as well as mass tourism, are being hit hard by the pandemic, and when food security is becoming a human security issue. Tourism and agriculture can be linked to promote so-called "zero-kilometre menu" restaurants using local products. Biosphere reserves in general encourage diverse local economies to revitalize rural areas.

BRIEF DESCRIPTION

Biosphere reserves, "learning places for sustainable development", are areas of terrestrial and coastal or marine ecosystems, internationally recognized within the framework of UNESCO's programme on Man and the Biosphere (MAB). They are nominated by national governments and remain under the sovereign jurisdiction of the States where they are located. Biosphere reserves must fulfil three functions: 1. *conservation* – contribute to the conservation of landscapes, ecosystems, species and genetic variation; 2. *development* – foster economic and human development which is socio-culturally and ecologically sustainable; 3. *logistic support* – support for demonstration projects, environmental education and training, research and monitoring related to local, regional, national and global issues of conservation and sustainable development. Applying countries must perform activities such as assessment of a potential for reserve; analyse the feasibility of the region; make provisions for mechanisms to manage human use and activities; develop a management policy or plan for the area; set up a designated authority or mechanism to implement this policy or plan; and identify programmes for research, monitoring, education and training.[20] These are the areas where the applying countries may need technical or financial support. Analysing the economic impact or gross added value of biosphere reserves is another area that is currently not sufficiently addressed. Existing sites also face challenges such as lack of support from or participation by local communities, coordination between institutions at different levels, economic development in biosphere reserves (e.g., road construction) and illegal activities.

CASE STUDY

Conservation and sustainable use of biodiversity in biosphere reserves in Central and Eastern Europe[21]

Implementation of sustainable tourism practices in the selected biosphere reserves in Czechia, Hungary and Poland have been achieved through the development of an innovative and environmentally and

[20] https://en.unesco.org/biosphere/guidelines

[21] Supported by the United Nations Environmental Programme (UNEP)/Global Environmental Facilities (GEF) - Sub-Programme Title: Biodiversity - 3: Forest Ecosystems and cuts across OP4 https://www.oete.de/index.php/en/projects/projects-2005-2015/tourism-and-biodiversity-in-central-eastern-europe

socially friendly tourism management system. Using the UNEP/CBD International Guidelines for Biodiversity and Tourism Development, documents such as the Criteria for Sustainable Tourism, Sustainable Tourism Management Planning in Biosphere Reserves and the Sustainable Tourism Training of Trainers Programme were elaborated. Following extensive awareness raising and capacity development, a great number of tourism initiatives and activities have ensured the distribution of returns for conservation purposes as well as to local stakeholders. For instance, local producers and entrepreneurs in the Sumava region in Czechia offer a large number of certified[22] original and ecological food, textile or cosmetic products, certified accommodation and services. In summers, special Green buses connecting different areas provide a great opportunity to explore the region without cars. In summer 2020, Sumava was included among the most popular destinations for domestic tourism, according to the survey conducted by Czech "Save the Tourism", which focused on the consequences of COVID-19.

Education initiative in the SALZBURGER LUNGAU & KÄRNTNER NOCKBERGE biosphere in Austria[23]

The "Educational Concept for Schools" in the reserve is based on three subprojects. First, well-trained rangers come to the schools with the mobile exhibition "Schlaufux on Tour" to inspire the children about the biosphere reserve. In this interactive exhibition, the students become explorers, and discover the flora and fauna and geological features of the Nockberge. The second part comprises outdoor days, including school trips, hiking days and project weeks. And the third and most important part of the project comprises the biosphere reserve schools. In June, five schools of the four biosphere municipalities were awarded the title of "biosphere reserve schools". Special teaching materials were developed, and the topic of the biosphere reserve will be included in their curricula.

SDG TARGETS

8.9: By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products

12.b: Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products

15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements

RESOURCES

UNESCO: Its Man and the Biosphere (MAB) programme officially approves biosphere reserves designated by national authorities and provides guidance for their establishment and management. https://en.unesco.org/biosphere/about

http://www.biospheresmart.org/ - Collection of best practices and examples of outstanding contributions to improving the green economies and sustainable development in biosphere reserves.

ILO: provides technical assistance on sustainable tourism development, including eco-tourism, to maximize the creation of decent jobs and the preservation of the local environment. https://www.ilo.org/global/topics/green-jobs/lang--en/index.htm; https://www.ilo.org/asia/areas/green-jobs/WCMS_183814/lang--en/index.htm

[22] By the Regional Labelling Association, focused on promoting Czech regions (both traditional, known for example for their preserved nature, healthy environment, folk traditions, etc.) and draw attention to interesting products that are created there.

[23] https://en.unesco.org/mab/strategy/goodpractices

CATEGORY: **Tourism, Biodiversity action**

MEASURE 5

Unlock the potential of domestic tourism to support sustainable rural and urban development

BENEFITS

Considering the impact of the COVID-19 pandemic on international tourism,[24] domestic tourism now represents an opportunity for countries to recover from the social and economic impacts of the pandemic and further support rural and urban development. Worldwide, domestic tourism is over six times bigger than international tourism (1.4 billion international arrivals in 2018).[25] Sustainable tourism is seen as an environmentally sensitive and inclusive industry. Domestic tourism provides jobs for local communities and supports employment of women (worldwide, a significantly higher proportion of women, 54%, is employed in tourism than in most of other sectors) and young people.[26] It has a potential to become an important source of government revenue.

BRIEF DESCRIPTION

Immediate post-pandemic financial and marketing support to domestic tourism must be combined with and followed by measures supporting tourism that have minimum negative impact on environment, are resilient to climate change and carbon neutral, support the protection of local natural and cultural heritage and ensure the involvement and ownership of local communities and the use of local products. Measures selected would depend on various factors, such as the actual level, scale and tradition of domestic tourism in the country and on the targeted beneficiary (from larger tourist agencies, through municipalities, to small family-based businesses). Potential focus areas for support are the *legal, regulatory and institutional framework* (e.g., for conservation, use and management of selected areas, or compliance with environmental standards); *fiscal and financial instruments* such as green tourism taxes, grants, loans, and public-private partnerships providing funds for environmental protection, starting up or expanding tourism businesses, or for infrastructure (clean transport, access to water and sanitation, waste management); *capacity development* for planning and management*; marketing and promotion*, for example, green accreditation and certification schemes to promote ecotourism and agritourism; and *awareness raising* on sustainability concept of both travellers and providers.

CASE STUDY

Turning Armenian hospitality into a business plan

The Integrated Rural Tourism Development project[27] in Armenia supports about 60 rural communities in creating alternative sources of income through tourism development. It applies a strategic and integrated approach to link local actors and promote and maintain the economic, social, cultural, natural and human resources of the localities. The following interventions have been implemented: selection of 8 targeted villages (52 yet to be selected) based on an inventory of touristic resources in more than 925 villages; establishment of the Bridge Network linking more than 60 private tourism companies to facilitate open

[24] The UNWTO scenarios for 2020 estimate the loss of up to 910 million to $1.1 trillion in export revenues and 100-120 million jobs. https://www.unwto.org/news/covid-19-international-tourist-numbers-could-fall-60-80-in-2020

[25] Measured in number of tourist trips.

[26] UNCTAD, *COVID-19 and Tourism Assessing the Economic Consequences,* 2020.

[27] https://www.am.undp.org/content/armenia/en/home/projects/integrated-rural-tourism-development.html

dialogue on priorities and approaches to rural tourism development; establishment of R&D and Visitor Information Centres in four regions; the "Youth Career Trail" project that has recruited more than 25 young professionals; pro-business oriented projects such as "Innovation Challenge Armenia"; and the opening of 35 "Gastro Yards" – a unique business model where households integrate tourism into their daily lives by offering guests local food and introducing them to local people and culture.[28] The project is financed by the Government of the Russian Federation and implemented by UNDP in Armenia in cooperation with the Armenian Ministry of Territorial Administration and Development.

Slovenia confirms its leading role among tourist destinations[29]

Slovenia received the Best of Europe 2020 Award[30] in the field of sustainability, for its sustainable tourism management practices and for involving local communities in tourism activities, while successfully managing the challenges posed by tourist growth trends. In less than 6 years, 53 tourist destinations, 45 accommodation providers, 4 nature parks, 2 travel agencies and 1 landmark have joined the "Green Scheme of Slovenian Tourism", a national programme and certification scheme that applies the Global Destinations Standards. Lake Bled takes the Earth Award for its waste volume reduction campaign and its sustainability efforts. To support green mobility, the Bled area offers many walking paths, rental of ordinary and electric bikes, shuttle and "hop-on hop-off" buses connecting areas around the lake and many charging stations for electric cars.

SDG TARGETS

8.9: By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products

12.b: Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products

15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements

RESOURCES

UNWTO promotes responsible, sustainable and universally accessible tourism.
https://www.unwto.org/EU-guidebook-on-sustainable-tourism-for-development

UNDP Europe and Central Asia helps several countries to develop and maintain tourism "in the pandemic age". https://medium.com/@UNDPEurasia/can-tourism-be-sustainable-in-the-pandemic-age-81de6c1d185c

[28] https://www.am.undp.org/content/armenia/en/home/presscenter/pressreleases/2019/_art-takard_-gastro-yard-opening-in-khachpar-village.html
[29] https://www.slovenia.info/en/stories/green-story-of-slovenia
[30] Awarded by the ITB Berlin (Internationale Tourismus-Börse Berlin) - the world's largest tourism trade fair.

CATEGORY: **Climate action, Biodiversity action, Water**

MEASURE 6:

Nature-based solutions – one of the key components of the transformational change needed to adapt to climate change and help ongoing efforts to limit it

BENEFITS

Nature-based solutions (NbS) are solutions that are inspired and supported by nature, are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. The benefits are often interrelated. For instance, NbS can improve air quality (environmental benefit), which allows a decrease in diseases related to air pollution (health benefit), which in turn allows savings in healthcare (economic benefit). Research suggests that NbS could provide around 30% of the cost-effective mitigation that is needed by 2030 to stabilise warming to below 2°C. They also provide a powerful defence against the impacts and long-term hazards of climate change.[31] For instance, an amount of about US$57 billion is saved in China, India, Mexico, the USA and Viet Nam each year by averting flooding damages through mangroves.[32] NbS help to create new jobs and economic growth, through the manufacture and delivery of new products and services that enhance natural capital.

BRIEF DESCRIPTION

Nature-based solutions bring more diverse nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions. Governments need to incorporate NbS in development and spatial planning, and in the planning of relevant sectors, e.g. agriculture, forestry and water management. NbS should also be integrated into national plans related to countries' commitments under international processes, such as National Adaptation Plans and National Adaptation Programmes of Action. There is a need to increase investments in the research informing on value of and providing evidence for NbS, as well as in the development, uptake and upscale of innovative NbS. NbS actions in all naturally occurring ecosystems should be supported, not only terrestrial forests. Other ecosystems, such as peatlands, mangroves, estuaries, seagrass, natural grasslands and soils, are often richer in carbon and support high levels of biodiversity. Investing in large-scale afforestation with monoculture or low diversity commercial tree plantations, especially non-native species, should be avoided. These have lower or less stable rates of carbon sequestration, little biodiversity value compared to restoring natural ecosystems, release much of stored carbon when harvested and are more susceptible to damage and loss from pests, diseases, drought, fire and climate change than natural forests. Finally, local, including indigenous, communities should be consulted to ensure that traditional knowledge informs both scientific investigations and policy formulation on the effectiveness of NbS and that the right of indigenous peoples to free, prior and informed consent is respected.[33]

CASE STUDY

SHIFTING GROUND - Capturing carbon and unleashing potential in the peatlands of Belarus, Ukraine and the Russian Federation[34]

[31] https://www.iucn.org/theme/climate-change/resources/key-publications/strengthening-nature-based-solutions-national-climate-commitments

[32] https://www.iucn.org/theme/nature-based-solutions

[33] Text in this section is adapted from the "Recommendations for enhancing ambition for Nature-based Solutions to climate change impacts in the Nationally Determined Contributions", by the Nature-Based Solution Initiative. https://www.nbspolicyplatform.org/wp-content/uploads/2020/02/NbSGuidelines_Jan2020.pdf

[34] https://undp-climate.exposure.co/shifting-ground

In Eastern Europe and the Russian Federation rural villages peats create vital wetland ecosystems. They are home to hundreds of rare bird species and aquatic life and are critically important in preventing climate change, because they sequester billions of tons of carbon that would otherwise be released into the atmosphere. Peatlands are extremely prone to fires when they are drained or degraded. The EU funded and UNDP supported Clima East Pilot Project has supported building the capacity of the national GHGs inventory system and developing and piloting an ecosystem-based approach for restoring degraded private arable peatlands into semi-natural conditions. The project restored water management systems and cleaned channels, created local jobs that sustainably utilise natural resources and improved the health of the lands – all solutions that benefit both human communities and natural peatland ecosystems. If the peatlands can be maintained and protected for the next 20 years, it will keep 132 million tonnes of CO_2 in the ground, the equivalent of taking more than 20 million cars off the road. If peatland communities can be empowered to protect their own homes and livelihoods by restoring the environment, their experience can serve as a salutary example for others.

Incentives for nature-based solutions in Switzerland[35]

The Swiss federal government has provisions for incentivizing NbS. In practice, the federal government makes an agreement with a canton to undertake NbS in line with federal laws. Examples include flood protection and water resource management (including through river renaturation), avalanche and landside protection through, for example, forest services, and biodiversity management. Work is undertaken at the municipal level through an agreement with the canton. Municipalities are in charge of both realizing the work and paying for it. Municipalities receive the subsidy through their canton. The canton can add to the subsidy. For NbS relating to river renaturation, federal contributions vary from 35% to a maximum of 80% of costs incurred. The cantonal subsidy can vary between 10% and 35%, leaving the municipality to contribute between 5% and 20%.

SDG TARGETS

13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

15.9: By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts

15.a: Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems

RESOURCES

UNEP NbS-related programmes are listed at https://www.unenvironment.org/unga/our-position/unep-and-nature-based-solutions

UNDP has developed the NbS for NDCs Pathway Framework, a 7-step approach for national governments to integrate or enhance NbS in their NDCs. https://www.ndcs.undp.org/content/ndc-support-programme/en/home/impact-and-learning/library/nature-based-solutions-for-ndcs-pathway-framework.html

UNDRR: supports member countries with how-to-do information on setting up and implementing nature-based solutions for DRR and CC adaptation: https://www.preventionweb.net/publications/view/74082

ILO: produces practical guidance and provides technical assistance to support countries on employment-intensive investments and public employment programmes that adopt NbS for addressing climate change. https://www.ilo.org/global/topics/employment-intensive-investment/themes/green-works/lang--en/index.htm; ILO and WWF on NbS and a green jobs recovery https://www.ilo.org/wcmsp5/groups/public/---ed_emp/documents/publication/wcms_757823.pdf

[35] www.bafu.admin.ch/uv-1817-f

CATEGORY: **Agriculture and food security, Climate action and Biodiversity action**

MEASURE 7

Support sustainable and climate resilient agriculture that contributes to economic profitability, a healthy environment, and social and economic equity.

BENEFITS

Globally, agricultural production and consumption are projected to be 60% higher in 2050 than today. Unsustainable agricultural practices and industrialized agriculture have negative impacts on soil, water, air and human health, representing an external cost paid for by governments and taxpayers. Agriculture contributes an estimated 19 to 29% of global GHG emissions. Excessive use of antimicrobials in animal and human healthcare leads to an estimated 33,000 human deaths in the EU every year.[36] Despite the large share of industrialized agriculture, it is estimated that, in the ECA region, more than 100 million people (11 percent of the total population) are exposed to moderate[37] or severe food insecurity.[38] The dual threat of extreme weather and the economic downturn caused by COVID-19 may worsen the situation, especially in the net food importer countries where food availability may decrease on average by about 20%.[39] Rural women, responsible for half of the world's food production and producing between 60 and 80% of the food in most developing countries, are particularly vulnerable to those threats.[40]

BRIEF DESCRIPTION

The main goal of promoting sustainable agriculture is to reduce the environmental and climate footprint of food systems and strengthen their resilience, ensure food security in the face of climate change and biodiversity loss and lead a transition towards "from farm to fork" sustainability and tapping into new opportunities. *Improved and better enforced policies and legislation* are needed to regulate for instance the use of pesticides, fertilizers and antimicrobials, animal welfare, environmental protection and land fragmentation and ownership. *Approaches* such as integrated pest management and integrated and optimized soil and water management should be promoted. *Financial support* should be redirected from subsidizing factory farming based on hectares (discriminating against smaller farm holders) to rewarding a farmer for undertaking environmental protection and climate-related measures. "Eco-schemes" should be introduced to boost sustainable and climate-smart[41] practices, such as precision agriculture, agro-ecology (including organic farming), carbon farming, agroforestry and carbon-efficient livestock farming. Countries should invest in sustainable agriculture *research*, climate-resilient *technologies* and *infrastructure*, *digital technologies* to assist farmers from a distance, and *education* for male and female farmers. Women's status in agricultural value chains needs to be improved by expanding their access to the basics of work productivity, including land tenure, financing, inputs, extension services, training, markets, paid work, and decision-making authority. On the demand side, consumers should be educated

[36] EC, Farm to Fork Strategy: For a fair, healthy and environmentally-friendly food system, EU, 2020

[37] Introduced for the first time in 2019, the prevalence of moderate or severe food insecurity, derived from the same FIES (Food Insecurity Experience Scale) database, looks beyond hunger to reflect the goal of ensuring access to safe, nutritious and sufficient food.

[38] 2019 Europe and Central asia Regional Overview of Foof Security and Nutrition: Structural Transformation from Agriculture for Improved Food Security, Nutrition and Environment

[39] http://www.fao.org/documents/card/en/c/cb0206en

[40] IUCN, UNDP, GGCA (2009). Training manual on gender and climate change https://www.iucn.org/content/training-manual-gender-and-climate-change-0

[41] List and explanation of the climate-smart agricultural practices is available at http://www.fao.org/climate-smart-agriculture/knowledge/practices/en/

and informed (through food certification and labelling) on both nutrient content and applied agricultural practices, for them to make informed, healthy and sustainable food choices.

CASE STUDY

Coming to grips with climate change's impact on agriculture in North Macedonia[42]

In North Macedonia, agriculture has a significant share of the economy and makes up almost 20% of total employment. Rising temperatures, changes in rainfall quantity and schedule, and an increased frequency of extreme weather events are becoming key challenges for small-scale farmers, responsible for about 87% of the country's total agricultural production value. Timely weather information is needed to optimize farmers' interventions and maintain their agricultural production. In 2017, an FAO project supported the installation of three hydrometeorological stations in Strumica, Gradsko and Kochani. Analysis of climatic trends, improved forecasts and agrometeorological information strengthen the capacity of farmers to adapt to climate change. The project trained farmers, agricultural organizations and the National Extension Agency on how to introduce climate change adaptation measures for crops and livestock, how to identify and control major climate related pests and diseases, and how to use agrometeorological information to cope with climate variability and extreme weather events. Curricula on climate change for secondary agriculture schools were developed. FAO has supported the establishment of several systems, e.g. the National Agro-Ecological Zoning (NAE Z) and a Land Resources Information Management System (LRI MS), enabling progress in techniques, policy and investments to achieve sustainable agricultural development.

SDG TARGETS

2.3: By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment

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

2.a: Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries

RESOURCES

FAO: Promotes sustainable food and agriculture to help countries worldwide achieve Zero Hunger and the SDGs. More information. http://www.fao.org/sustainability/background/en/

UNDP Cultiv@te - a Global Innovation Initiative for Sustainable Agriculture supports local innovators, technology experts, corporate mentors, and financiers to co-design solutions with farmers and policy makers. More information, including on finalist start-ups from Armenia and Uzbekistan are at: https://www.agorize.com/en/challenges/undp-cultivate

UNEP has led the TEEBAgriFood initiative focusing on the economic evaluation of the "eco-agri-food systems" complex, demonstrating that the economic environment in which farmers operate is distorted by significant externalities. http://teebweb.org/our-work/agrifood/understanding-teebagrifood/about/

[42] FAO: Food and Agriculture: Key to Achieving the 2030 Agenda for Sustainable Development in Europe and Central Asia, 2019

CATEGORY: **Biodiversity action**

MEASURE 8

Acknowledge the importance of forests for human health and well-being and integrate health and nutrition aspects into forest management planning

BENEFITS

Besides timber and the provision of ecosystem services, forests have important benefits for human health (mental, physical and spiritual), well-being and nutrition. Forests provide edible products (fruits, leaves, nuts and seeds, mushrooms, honey, wild meat, etc.) that contribute macro- and micronutrients to a healthy diet, both for rural and urban populations. A survey of over 17,000 households in 28 European countries showed that almost 92% had consumed (by purchasing mainly) wild forest products (game, mushrooms, edible plants) in 2015. At least 60% of current medicinal plant products may be obtained from wild harvesting. Physical activity conducted in parks and forests reduces the risk of both mental illnesses such as depression and non-communicable diseases. The healing potential of forests has manifested itself also during the COVID-19 outbreak. Forests and parks buffer noise, reduce the urban heat island effect and absorb pollution from traffic and industry. However, the loss and fragmentation of forest habitats, expansion of human populations into forest areas and increased contact of humans with wild animal products largely contributes to the outbreak of a number of zoonotic diseases such as malaria, dengue fever, Lyme disease, HIV, Ebola and currently, COVID-19.[43]

BRIEF DESCRIPTION

To protect and manage forests sustainably, governments and agencies should (a) promote *best practices of sustainable forest management,* including provision for public participation; (b) promote a *One Health*[44] *approach* bringing together professionals and policymakers in forestry, natural resources, agriculture, livestock and public health and nutrition for designing adequate health solutions; (c) promote *livelihood and income generation opportunities* for forest communities, including the sale of sustainably harvested forest products and nature-based tourism enterprises, and *undertake reforestation and greening initiatives* in urban and peri-urban areas; (d) *manage wildlife sustainably* and promote safe handling of wild meat while taking into account the possible transmission of zoonotic diseases; (e) *include health and nutrition aspects in forest management planning*; (f) *develop methods for measuring the health benefits of forests*, and allocate resources to initiatives linking forests and human health; (g) *encourage partnerships* among governmental and intergovernmental agencies, the private sector, civil society organizations and research institutions to promote innovative approaches and the sharing of best practices; (h) e*ncourage behaviours* based on a vision of humans as part of nature and nature as linked to human well-being; and (i) last but not least, strengthen women's role and rights to forest resources since women tend to use their income from forest activities to feed their families.[45]

[43] The text in this section is adapted fromFAO: Forests for human health and well-being; 2020.

[44] 'One Health' is an approach to designing and implementing programmes, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes. https://www.who.int/news-room/q-a-detail/one-health

[45] This text is largely copied from FAO: Forests for human health and well-being; 2020.

CASE STUDY

Inspiring fruit tree cultivation and use in Central Asia[46]

The Central Asian countries, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, are centres of origin for and particularly rich in temperate fruit and nut tree species with global commercial and nutritional importance. Uzbekistan alone is home to 83 traditional varieties of apricot, 43 of grape, 40 of apple and 30 of walnut. Growing in rugged, mountainous terrain, the plants have high genetic diversity and are thought to be critical in the development of disease-resistant and climate-tolerant fruit varieties. Yet this native genetic diversity of fruit tree species has greatly suffered due to deforestation, industrialization, logging and overgrazing. During a five-year project by Biodiversity International, over 50 fruit tree nurseries were set up – producing over 1.5 million seedlings of traditional varieties of apple, grape, pomegranate and other fruit and nut trees, annually. Assessment of the project results has shown that in Uzbekistan, fruit trees, including wild fruit species, were allocated 5% more land than before, and that apricot was the most popular among farming households. Throughout the years of activity, 1,500 farmers were trained in soil, water and crop management practices. The project assessment stressed that, in future, such initiatives would benefit from more involvement of youth, to promote continuity of the practices as their parents age.

Protecting Georgian forests from space[47]

Decision-makers use the new Forest and Land Use Atlas of Georgia, an online tool that allows them to perform better planning, execution and monitoring of activities in the forests, including illegal or excessive logging. The Atlas combines the global satellite data of the forest monitoring platform Global Forest Watch with Georgia's national forest data. It is also widely used by students, NGOs, scientists, tourists and just ordinary people who can get the information online.

SDG TARGETS

15.2: By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally

15.b: Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation

RESOURCES

FAO Forestry helps nations manage their forests in a sustainable way. Its approach balances social, economic and environmental objectives so that present generations can reap the benefits of the earth's forest resources while conserving them to meet the needs of future generations. More information available in the Forestry communication toolkit. http://www.fao.org/forestry/91228/en/

UNEP generates knowledge on the socioeconomic value of forest ecosystem services; promotes cross-sectoral awareness; supports planning and policy reforms; and develops capacity in developing countries. See its new factsheet: Investing in Forests to Build Back Better & Greener. https://www.unep.org/resources/factsheet/investing-forests-build-back-better-greener

[46] https://www.bioversityinternational.org/ar2015/inspiring-fruit-tree-cultivation-and-use-in-central-asia/
[47] https://www.unenvironment.org/news-and-stories/story/protecting-georgian-forests-space

CATEGORY: **Waste management**

MEASURE 9

Introduce environmentally sound healthcare waste management through minimization of waste and application of Best Available Techniques and Best Environmental Technologies

BENEFITS

Broadly speaking, medical waste generation increases exponentially in an epidemic outbreak and may, if improperly collected or treated, accelerate disease spread and pose a significant risk to medical staff, patients and waste collection and treatment staff (who, in some countries, are poor people with insufficient social security). The safe, equitable and environmentally-sound handling, treatment and final disposal of this waste is therefore essential to prevent negative effects on human health and the environment. In general terms, if medical waste management is environmentally sustainable, it respects the waste hierarchy by prioritizing the avoidance or minimization of wastes generated and ensuring that those generated are less hazardous, so that the need to manage wastes and/or the associated risks and costs are reduced**.**

BRIEF DESCRIPTION

Improper treatment and disposal of healthcare waste poses serious hazards to waste pickers, waste workers, health workers, patients and the community in general. During and after a pandemic biomedical and healthcare waste should be appropriately identified, collected, separated, stored, transported, treated and disposed of. There are many different types of medical waste – from masks to X-ray machines – and waste management strategies for these will have to be very different. Many countries lack adequate equipment and treatment technology and facilities and may need to be provided with mobile incineration and autoclave units, or with protective equipment and containers, especially for workers in medical waste facilities and hospitals, and in municipal waste management facilities. These temporary interventions need to be followed by measures promoting the equitable and environmentally sound management of hazardous, including medical waste. Such measures may focus on maximizing the circularity of the medical sector to better manage single-use products and devise strategies for the proper treatment of unrecyclable waste; minimisation of waste through a purchasing policy that includes product substitution, product changes, procedural changes, replacing disposable items with reusable items, and encouraging extended producer responsibility; leasing large medical equipment, for example, rather than purchasing it ("servicification"); guiding the public on how to safely dispose of household and personal medical waste; ensuring compliance with the relevant norms and standards (waste tracking and labelling, disposal unit licensing, record keeping and emissions monitoring); maintaining and expanding waste sorting and recycling programmes; providing stimulus packages and introducing business models for the operation of healthcare waste management, including public private partnerships; and introducing Best Available Techniques (BAT) and Best Environmental Technologies[48] for recycling and waste disposal (crucial mainly for waste incineration).[49]

[48] http://chm.pops.int/Implementation/BATandBEP/Guidance/Overview/tabid/5121/Default.aspx

[49] UNEP COVID-19 Waste Management Factsheet: Introduction to COVID-19 waste management; 2020

CASE STUDY

Sound waste management practices and technologies strengthen public health emergency preparedness in Kazakhstan[50]

In August 2020, UNDP handed over equipment for the treatment of infectious waste (an autoclave) and containers for safe waste collection to the Nur-Sultan City Centre of Phthisiopulmonology, which had been redesigned to serve patients with COVID-19, and hosts now the Centre for safe collection and disposal of infected medical waste. The initiative is implemented as part of a joint project of UNDP and the Asian Development Bank, which aims to strengthen national public health emergency preparedness, focusing on medical waste management system in the hospitals. Besides this immediate support, the joint project will help design standard operating procedures and a training programme for health workers to enhance their capacity to properly collect, sort, transport, dispose and monitor medical waste in hospitals. The project will also develop an effective digital healthcare waste management database for all regions of Kazakhstan. The new initiative is expected to lay the foundation for a sustainable medical waste management system not only under COVID-19 conditions, but also beyond.

SDG TARGETS

3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

3.d: Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks

11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

RESOURCES

WHO develops many practical resources such as 'Safe management of wastes from health-care activities: A summary': https://www.who.int/publications/i/item/WHO-FWC-WSH-17.05; 'Overview of technologies for the treatment of infectious and sharp waste from health care facilities: https://www.who.int/publications/i/item/9789241516228, and many others.

UNEP works to minimize the adverse effects of chemicals and waste on human health and the environment within its Chemicals and waste focus area. https://www.unenvironment.org/explore-topics/chemicals-waste; https://www.unenvironment.org/news-and-stories/story/healthcare-waste-what-do-it ; COVID-19 Waste Management Factsheet: Introduction to COVID-19 waste management.

UNDP helps countries strengthen their waste management systems, including waste prevention, reuse/recycling, treatment and disposal. Safe and effective treatment of hazardous medical waste through innovative technologies is also underway.
https://www.undp.org/content/undp/en/home/2030-agenda-for-sustainable-development/planet/environment-and-natural-capital/chemicals-and-waste-management.html

[50] https://www.kz.undp.org/content/kazakhstan/en/home/presscenter/announcements/2020/august/undp-delivered-an-autoclave-for-medical-waste-disposal--to-a-new.html

CATEGORY: **Transport and mobility, Climate action**

MEASURE 10

Promote low-carbon urban transport through improved urban and / or mobility planning, through shifting to sustainable travel means, improved vehicle fuel efficiency and electrification

BENEFITS

The transport sector accounted for 23% of global GHG emissions in 2010 and remains one of the fastest growing sources of global emissions, despite advances in vehicle efficiency. A range of transport-related climate mitigation actions and policies across the world's urban areas could save 2.8 Gt of GHG emissions annually by 2050 and could yield substantial economic, social and health-related benefits. Investments in expanding public transport and improving vehicle efficiency could create more than 3 million net jobs annually in OECD cities, and between 3 million and 23 million net jobs annually in non-OECD cities, in the period to 2050. Vulnerable populations, who are often more likely to live and work in polluted areas, would benefit disproportionately from interventions that improve air quality.[51]

BRIEF DESCRIPTION

There is a wide range of options available to policymakers to promote low-carbon transport in cities, but their selection needs to be tailored to specific urban contexts. Available measures may be grouped in the following areas: (1) compact urban and mobility planning and reducing passenger travel demand, resulting in shorter access to work, school and other activities, and therefore reduced need for passenger car travel; if developing a low-carbon transport strategy, it should ideally be integrated into the (updated) city development plan; (2) shifting passenger travel mode from private vehicles towards more sustainable travel means, including walking, cycling and expanding clean public transit. This would entail building necessary infrastructure and awareness, but also offering appealing alternatives (e.g., shared city bikes or electric scooter), since travelling attitudes and habits are often very deep-rooted and can be hard to change. Any actions taken should be based also on the knowledge of the gender differences in decision making and participation in transport considering the fact that women use more public transport than men, they have more non-work related trips, more likely to have shorter commute distances, to travel at off- peak hours, and to choose more flexible modes.[52] (3) improving passenger car fuel efficiency and electrification by applying sustainable transport technologies (e.g., fuel cell buses and use of biofuels) and incentivising the electrification of passenger cars and building the necessary infrastructure; (4) improving freight logistics (e.g., from freight to rail shift, more efficient delivery patterns, city exclusion of freight during weekend), and freight vehicle efficiency and electrification. In addition, many countries introduce national and local fiscal and regulatory measures, such as fuel tax, vehicle tax based on fuel efficiency and/or CO_2 emissions, vehicle fuel efficiency regulation, road user charging, parking pricing, access restrictions and registration restrictions.[53]

[5151] https://apo.org.au/sites/default/files/resource-files/2018-06/apo-nid204341.pdf

[52] Wei-Shiuen Ng and Ashley Acker (2018). Understanding Urban Travel Behaviour by Gender for Efficient and Equitable Transport Policies, International Transport Forum, Paris, France https://www.itf-oecd.org/sites/default/files/docs/urban-travel-behaviour-gender.pdf; International Energy Agency (2020). Tracking Transport 2020 https://www.iea.org/reports/tracking-transport-2020

[53] https://apo.org.au/sites/default/files/resource-files/2018-06/apo-nid204341.pdf

CASE STUDY

Innovative approaches support development of the very first Urban Mobility Plan of Chisinau

The "Urban Mobility Hackathon. Hack the traffic in Chisinau", the first hackathon in the Republic of Moldova, took place to analyse stratified data on transport and people's mobility in the city. The teams, consisting of web developers, data analysts and urban planners, analysed complex geo-referenced urban mobility data and, on that basis, proposed solutions for remodelling public transport. The participants were guided by experienced mentors from the European Space Agency, Orange Systems, UNDP and Chisinau City Hall. The participating teams came up with various ideas: trans-shipment modes; flexible timetable of trolleybus/bus routes depending on actual population density; restricting private transport on certain priority segments for public transport during peak hours; mechanisms for digital detection of road segments with traffic jams; a mobile application for accumulating loyalty points when using public transport; etc. The Hackathon is the result of an innovative partnership among UNDP, the European Space Agency, Orange Systems, Chisinau City Hall, and the innovation laboratories Green City Lab and Milab. UNDP and Orange Systems were willing to support the implementation of the winning solutions financially and with expertise. Results were also to be reflected in the very first Chisinau Urban Mobility Plan, supported by the UNDP/GEF project "Moldova Sustainable Green Cities". Results included: the establishment of the Green City Lab www.greencity.md; implementation of six Fast Track Challenge Programme innovation projects tackling mobility, waste management, water pollution and energy efficiency; and development of the citizen engagement and reporting online platform.[54]

SDG TARGETS

11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

RESOURCES

UNEP: works to promote sustainable, clean and low-emission transport. It participates in several global transport programmes addressing fuel economy, small particulate pollution and infrastructure development, etc. https://www.unenvironment.org/explore-topics/transport/why-does-transport-matter

UNECE and WHO: work jointly within the Transport, Health and Environment Pan-European Programme – The PEPP, to promote safe, clean and competitive transport. https://thepep.unece.org/

UNDP: supports sustainable cities through integrated solutions that combine renewable energy and efficiency measures with other aspects of urban design, such as sustainable mobility and transport, and through the introduction of sustainable transport technologies and systems and the use of biofuels. https://www.undp.org/content/undp/en/home/2030-agenda-for-sustainable development/planet/sustainable-energy/sustainable-cities-and-transport.html

[54] https://www.md.undp.org/content/moldova/en/home/projects/Moldova-Sustainable-Green-Cities.html

CATEGORY: **Transport, air quality, climate action**

MEASURE 11

Promote cycling in urban areas to decrease air pollution and improve health of city dwellers through developing and investing in cycling policies implementation

BENEFITS

The value of health benefits from investments in cycling infrastructure can amount to more than five times the investment needs.[55] Several studies have shown that health benefits of cycling in a city well outweigh the risks associated with individual increases of air pollution exposure or motor vehicle accidents.[56] Investing in cycling infrastructure brings benefits such as relieving congestion and improving the air quality. By also transporting goods in inner cities, bicycles can be a cheap and often faster alternative to a car. For longer trips, the combination of cycling and train or metro is appropriate. Therefore, investing in cycling infrastructure can also encourage a modal shift as more people will use the train.

BRIEF DESCRIPTION

Introducing cycling in a city should not be a single measure. To succeed, a cycling policy needs to be developed and, more importantly, integrated with other projects, such as urban renewal, economic investment in neighbourhoods, or with urban mobility plans. It should be developed in the context of a long-term vision for the city. Being supported by the municipality and linking to other government policies increases chances for recognition of the cycling policy and funds generation. A good way to start is with pilot projects, as new knowledge can be generated. Finally, collect cycling data on which to base policies. Two types of equally important measures are needed to introduce an urban cycling policy: (i) hardware of cycling or infrastructure and (ii) support actions. *Infrastructural measures and equipment* focus primarily on cyclists' safety and on enabling their smooth and uninterrupted mobility. Infrastructural measures, which may require considerable amounts of investment, include mainly introducing cycling paths, bridges and traffic lights but also provision of bicycles made available for shared use to individuals – increasingly popular bike-sharing. *Support actions* focus on behavioural, cultural and legislative aspects and may include the establishment or cooperation with cycling organizations, such as cycling associations or coalitions; building relationships with other stakeholders like schools, engineering firms, consultants and employers (who may introduce car-curbing measures such as such as paying for parking or providing a lower mileage allowance); marketing through promotion campaigns, cycling events, posters and merchandise; and education by providing for instance (free) cycling lessons.[57]

CASE STUDY

How the pandemic sparked a European cycling revolution[58]

The COVID-19 pandemic has triggered unprecedented investment in cycling in many European cities. More than EUR 1 billion (GBP 907m; US$1.1bn) has been spent on cycling-related infrastructure and 2,300km (1,400 miles) of new bike lanes have been rolled out since the pandemic began. In Milan, 35km of new

[55] https://apo.org.au/sites/default/files/resource-files/2018-06/apo-nid204341.pdf

[56] Coalition for Urban Transition: The Economic and Social Benefits of Low-Carbon Cities: A Systematic Review of the Evidence; 2018, https://apo.org.au/sites/default/files/resource-files/2018-06/apo-nid204341.pdf

[57] For more information see: CIVITAS: Smart choices for cities: Cycling in the City; 2016, https://civitas.eu/sites/default/files/Results%20and%20Publications/civ_pol-09_m_web.pdf

[58] https://www.bbc.com/news/world-europe-54353914

cycle paths have been built (though some of them temporary) and the number of cyclists increased from 1,000 before COVID-19 to 7,000. In Paris, EUR 20m was invested in cycling and cycling levels have increased by 27% compared with the same time last year. Some sections of roads became completely car free. The French Government is offering a EUR 50 subsidy towards the cost of bike repairs and free cycling lessons. Unlike other businesses, repair shops stayed open throughout the whole of lockdown. In Amsterdam one electric bike seller sold more bikes in the first four months of 2020 than he did in the previous two years. These examples show the potential cycling has to change cities and their dwellers. It is important that there is still a strong political will and investments to promote this trend further after the pandemic.

In Ukraine, the number of cyclists in the capital increased by 2.5 times during the lockdown. In order to extend this effect after the end of the lockdown, the city authorities will continue developing Kyiv's cycling infrastructure by increasing the number of bicycle lanes and expanding the Nextbike bicycle rental network.[59]

In Belarus, the GEF-funded "Green Cities" project promotes cycling as an integral part of green urban mobility and invests in building of cycling infrastructure in pilot towns. In Novopolatsk, the majority of residents expressed concerns about limited opportunities for bike parking and storage. The project responded with the construction of five new bike garages, each of them accommodating up to 20 bicycles. All new garages are thief-proof and protect bikes from weather conditions.[60]

SDG TARGETS

11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

RESOURCES

WHO has developed a comprehensive Health economic assessment tool (HEAT) for cycling and walking, to estimate the reduction in mortality resulting from regular walking or cycling, along with method and guidance for practitioners on inclusion of health effects in economic valuations of transport interventions that facilitate cycling and walking

UNEP: The "Share the Road" programme supports governments and other stakeholders in developing countries to move away from prioritizing the car-driving minority, towards investing in infrastructure for the majority: those who walk and cycle. https://www.unenvironment.org/explore-topics/transport/what-we-do/share-road

UNECE with WHO have prepared the pan-European Master Plan for Cycling Promotion, covering 54 countries across the region. When finalized, it will provide guidance about how to support cycling at the national level. https://ecf.com/what-we-do/cycling-all-policies/pan-european-master-plan-cycling-promotion

[59] OECD; COVID-19 response measures and their potential implications for greening the economies of Eastern Europe, the Caucasus and Central Asia; 2020

[60] https://www.by.undp.org/content/belarus/en/home/presscenter/pressreleases/2020/green_mobility_green_cities_covid19.html

CATEGORY: **Infrastructure, Transport and Mobility**

MEASURE 12

Improving and innovating rail transport as a component of an overall aim to develop green infrastructure contributing to sustainable growth

BENEFITS

In terms of investments, rail transport represents an action that is sustainable and offers the largest climate mitigation compared to road and air transport. Rail is six times more energy efficient than road and is nine times less CO_2 intensive than road for freight and air travel for passengers. The average CO_2 emission per passenger and per kilometre reaches 8.6 g with a train versus 168 g with a plane and 207 g with a car.[61] Rail helps to lower health damaging air pollution levels in urban centres, boosts urban sustainable development, lowers land use, and increases city liveability. Investing in rail infrastructure, maintenance and operation stimulates economic growth with long-term benefits and creates green jobs. In Europe infrastructure managers are amongst the biggest investors. In 2016, they invested a total of EUR 34.8 billion in existing line enhancement and the construction of new lines.[62]

BRIEF DESCRIPTION

Considering the relevance and number of benefits rail transport presents, including being an engine for job creation, investment in railway infrastructure should be high on the policymaker's agenda for post-pandemic recovery, and beyond. For instance, the European Commission has set a target of shifting 30% of goods transport away from trucks, and onto rail and inland waterways by 2030, and subsequently by 50% by 2050. There is a wide range of measures that policymakers may select from to facilitate an increase in use of rail transport, depending on the baseline situation and needs of the country. Countries that experience serious rail infrastructure deterioration need to invest in infrastructure development and improvement, to make rail transport more reliable, time efficient and attractive for customers. Policymakers may further support continued electrification of rail, including cross-border missing links; facilitate transport-related research and innovation by focusing on marketability of multimodal solutions and new clean technologies (e.g., systems capable of recovering, storing and reusing braking energy of rail-based public transport, automation); improve logistics of the intermodal (including international) cargo flows (for the freight transport); make best use of rail stations by integrating them into active mobility, electric urban public transport and city logistics; and encourage the shift to rail by levelling the competitive playing field through internalization of external costs (related to air pollution-induced human health impacts and premature deaths, accidents, congestion, and infrastructure wear and tear), starting with a balanced carbon pricing policy across all modes. Allowing private investors in the sector can result in efficiency gains and increased consumer welfare if appropriate organizational, institutional and regulatory, including sustainable procurement, conditions are met.[63] It is also important to continuously raise awareness on benefits of using rail transport.

[61] http://www.cer.be/sites/default/files/publication/CER%20Factsheet%20Climate%202018.pdf

[62] https://fsr.eui.eu/the-observer-green-finance-and-sustainability-which-role-for-railways/

[63] Additional information available in OECD, *The Role of Private Investment in Transport Infrastructure*, 2019, https://www.itf-oecd.org/sites/default/files/docs/role-private-investment-transport-infrastructure.pdf

CASE STUDY

Faster, greener connections to southeast Europe[64]

The corridor linking central Europe with South-east Europe and the Black Sea is a vital connection between more recent EU members and candidate countries. To improve the flow of imports and exports in this corridor, the FLAVIA project has encouraged better logistics, so that more freight moves off the road and onto ships and trains, which are more environmentally friendly and less prone to traffic backups. The FLAVIA project facilitated such an intermodal split through actions on several fronts, including: reducing delays of freight trains at borders, replacing obsolete terminal techniques and overcoming mental barriers that people involved in shipping seem to have against intermodal transport. Improved logistics for intermodal cargo flow led to better interconnectivity of the regions, resulting in economic growth on both sides of the EU border. Based on the situation analysis, FLAVIA provided for the missing liner services, or shuttle trains, regular transport connections offered by transport operators that connect different shipping terminals. The FLAVIA project carried out more than 20 pre-feasibility studies of new intermodal connections to encourage businesses that deal in freight to initiate and use more intermodal transport relationships. This helps the corridor develop in a more environmentally sustainable way. The project helps extend this efficient approach into the Black Sea countries. FLAVIA establishes national pro-rail and terminal alliances that will continue promoting and developing intermodal transport and help formulate any necessary legal and infrastructure changes.

One ticket for the Legnica - Głogów Copper Area[65]

A pilot project in the Polish municipality of Lubin investigated tariff cooperation by developing a uniform tariff for all buses and trains in the area. Public transport is easier to use if passengers have to buy only one ticket. Along with reducing barriers to public transport use in and around Lubin, the pilot serves as an example for other regions in Poland that are considering similar cooperation on transit fares.

SDG TARGETS

9.1: Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all

9.4: By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities

RESOURCES

UNIDO is a custodian agency for maintaining a database for indicators under SDG 9. It aims to advance environmentally sustainable growth, builds institutional capacities for greening industries through cleaner production technologies and resource efficiency methodologies, and creates green industries, spurred by technology facilitation, innovation and partnership building. https://www.unido.org/unido-sdgs

UNECE works to promote sustainable transport through the development of freight and personal mobility by inland transport modes, environmental performance, energy efficiency, inland transport security and efficient service provision. Its Working Party on Rail Transport provides a pan-European forum for exchange of information and best practices. See https://unece.org/about-us-14

[64] EU, Project Stories from the Central Europe Programme Sustainable Public Transport and Logistics, 2014, https://www.interreg-central.eu/Content.Node/2-transport-final.pdf

[65] EU, Project Stories from the Central Europe Programme Sustainable Public Transport and Logistics, 2014.

CATEGORY: **Transport and mobility, Air quality, Biodiversity action**

MEASURE 13

Promote greener cities (including through nature-based solutions), urban air quality and healthy urban lifestyles to build resilience to respiratory diseases and to the health impacts of COVID-19

BENEFITS

Every year around 7 million premature deaths in the world – or 1 in every 8 – are attributed to the joint effects of household and outdoor air pollution. Of these air pollution-related deaths, 94% occur in low and middle-income countries.[66] 97% of cities in low- and middle-income countries with more than 100,000 inhabitants do not meet WHO air quality guidelines;[67] this may cause an increase in premature deaths caused by air pollution by 50-100% by 2050.[68] The economic consequences of air pollution are significant, in terms of costs to global healthcare services and reduced productivity. Air pollution costs the global economy more than US$5 trillion every year in welfare costs (4.8% of global GDP) and around US$225 billion in lost income.[69] As the COVID-19 pandemic has shown, drastic measures to reduce exposure to the virus led to some short and long-term public health benefits, but they came at a high cost.

BRIEF DESCRIPTION

Many recent studies support a negative association between long-term air pollution and COVID-19 health outcomes, particularly in terms of PM2.5 and NO_2 and their role in virus spread and lethality. Studies point to the high level of pollution in Northern Italy as a possible additional co-factor of the high level of COVID-19 related lethality in the area.[70] Building back better through promoting greener cities for improved urban air quality and healthier urban lifestyles is essential not least to build resilience to future COVID-19 waves or new pandemics. There is a wide range of options available to policymakers to promote greener cities (including through nature-based solutions), urban air quality and healthy urban lifestyles. High quality green spaces and waterways provide innovative solutions to urban challenges, such as flooding, heat stress, drought, poor air quality and unemployment and help biodiversity to flourish. The direct and indirect contributions of nature-based solutions (e.g., mix of vegetation and trees, species, shape, spatial distribution of public green space and vegetation coverage) help, besides other benefits, to combat air pollution and reduce allergy potential of the urban environment. New tools, models, design guidelines, standards and protocols to integrate nature-based solutions into local decision making, including in spatial planning, need to be applied or developed. Other aspects and opportunities include innovative governance, business and finance models promoting participatory co-creation processes in developing, implementing and assessing the impact of nature-based solutions. An interdisciplinary approach, including citizen science and the participation of applied natural sciences, social sciences, data science and humanities disciplines (such as behavioural economics, gender studies, urban planning, design and governance), must be used to properly address the complex challenges of this topic.

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[66] WHO (2018). Burden of disease from the joint effects of household and ambient Air pollution for 2016

[67] WHO Global Ambient Air Quality Database (update 2018)

[68] OECD (2012). OECD Environmental Outlook to 2050: The Consequences of Inaction

[69] World Bank and Institute for Health Metrics and Evaluation (2016). The Cost of Air Pollution: Strengthening the Economic Case for Action

[70] Conticini, E. et al. (2020) Can atmospheric pollution be considered a co-factor in extremely high level of SARS-CoV-2 lethality in Northern Italy?
https://www.sciencedirect.com/science/article/pii/S0269749120320601?via%3Dihub

CASE STUDY

Enhancing Barcelona's resilience through nature-based solutions[71]

Barcelona is highly populated and one of the busiest tourist destinations in Europe. In 2012, the city fell well short of the European Union's recommendation on access to green space (6.82 m^2 per capita compared to the 26 m^2 per capita target recommended by the EU (Laghai, 2012)). Air quality in Barcelona is poor. It is estimated that 3,500 lives could be saved annually in Barcelona by reducing current levels of air pollution to meet WHO standards (Künzli and Pérez, 2007). The city is also facing rising temperatures as a consequence of climate change, leading to extreme weather events, such as droughts and heat waves. The City of Barcelona, with its Green Infrastructure and Biodiversity Plan up to 2020 (City of Barcelona, 2013), is implementing a range of actions to bring nature into the city. The main objectives are to preserve and improve the natural heritage of the city and to conserve its biodiversity. This would ultimately bring environmental and social benefits for local people. With a similar vision, but with different solutions, the Trees Master Plan 2016–2035 has the overall aim of maintaining a well-managed, healthy and biodiverse woodland to improve green corridors and tackle the urban heat island effect.

SDG TARGETS

3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

3.d: Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks

11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

RESOURCES

WHO Air Quality and Health unit provides technical support to WHO Member States in the development of normative guidance and tools and provision of authoritative advice on health issues related to air pollution and its sources. It monitors and reports on global trends and changes in health outcomes associated with actions taken to address air pollution at the national, regional and global levels. https://www.who.int/teams/environment-climate-change-and-health/air-quality-and-health

UNEP works to tackle air pollution also by inspiring city leaders to act, strengthening laws and institutions. The *Planting Healthy Air* report identifies the potential return on investment from tree planting in 245 global cities, which currently house about a quarter of the world's urban population. https://www.nature.org/en-us/what-we-do/our-insights/perspectives/how-urban-trees-can-save-lives/?src=r.global.healthyair

UNECE: The Committee on Urban Development, Housing and Land Management addresses the housing and urban development challenges of the UNECE region and is the highest policymaking body of UNECE in housing, urban development and land management. It supports strengthening of national urban policies through the development of Country Profiles on Urban Development, Housing and Land Management and supports the development and implementation of national action plans on sustainable housing and urban development. See https://unece.org/housing

[71] https://oppla.eu/casestudy/17283

CATEGORY: **Water, Waste Management**

MEASURE 14

Provide equitable access to clean water, sanitation and hygiene through investing in resilient water and sanitation infrastructure and systematic hygiene services provision for all and in all settings

BENEFITS

Sewage and wastewater emptied into rivers, lakes and nearby streams pollute resources of drinking water and affect plant and aquatic life. Every year, millions of people die from diseases caused by inadequate water supply, sanitation and hygiene. Diarrhoea is one of the main causes of death in children under 5 years old. An estimated 829,000 deaths attributable to poor sanitation, unsafe water and inadequate hygiene occurred from diarrhoeal diseases in 2016 globally, equivalent to 60% of all diarrhoeal deaths. Poor sanitation and unsafe water cause nearly 20% of workplace deaths and cost around $260 billion in lost productivity every year.[72] The burden of inadequate access to water and sanitation is often felt disproportionately by women and girls. In societies where women and girls are responsible for water collecting, they need to walk long distances to fetch clean water, with significant costs for their physical and mental health and their education. Educational institutions that have inadequate water, sanitation and hygiene (WASH)-related facilities also cause girls to spend less time at school. Poor WASH services in health care facilities impair patient safety, quality of care and infection prevention control. It is more cost-effective to investing in water and sanitation than to deal with the consequences of under-investment. For example, $1 spent on improving sanitation brings a return of $5 by keeping people healthy and productive.[73] The market for jobs in the sector is promising, with significant potential for growth.

BRIEF DESCRIPTION

Access to clean water and to sanitation are basic human rights, but are far from universal.[74] About 3 billion people lack hand hygiene facilities at home[75] and 1 in 3 facilities globally do not have hand-washing necessities where care is provided.[76] Supply shortages during the COVID-19 pandemic have made access to hand hygiene products even more challenging.[77] Immediate support should secure delivery of safe and reliable water and sanitation services to health facilities, schools and vulnerable groups (homeless people, refugees, migrants, nomadic populations, etc.) through, for example, public water taps and the provision of hand hygiene stations in all public buildings and transportation hubs. Water affordability issues for households should be treated by targeting social support and with financial support to utilities delivering essential services. In the longer term, countries should systematically invest in water and sanitation-related infrastructure development and modernization. Investment should be based on the water safety

[72] https://unfoundation.org/blog/post/tapping-benefits-clean-water-sanitation-hygiene-achieve-sustainable-development-goals/

[73] Hutton, G. (2012). Global costs and benefits of drinking-water supply and sanitation interventions to reach the MDG target and universal coverage. Geneva, WHO.

[74] For a recognition of the human rights to safe drinking water and sanitation and a reference to their normative content see United Nations General Assembly in Resolution 70/169.

[75] https://news.un.org/en/story/2020/10/1075412.

[76] https://data.unicef.org/resources/global-progress-report-on-wash-in-health-care-facilities-fundamentals-first/

[77] OECD; Tackling coronavirus (COVID-19) Contributing to a global effort Environmental health and strengthening resilience to pandemics; 2020.
https://www.unece.org/fileadmin/DAM/RCM_Website/OECD_Covid_env_health_brief_April_2020.pdf

and sanitation plans to assess the needs, challenges and risks for services provision, including those posed by climate change, and identify and cost adequate measures. Systematic inclusion of hygiene promotion and services in programmes and investments will improve effectiveness and increase benefits.

CASE STUDY

Safe drinking-water and effective water quality monitoring in rural Tajikistan[78]

The provision of safe drinking-water is a challenge for small water suppliers with higher frequencies of waterborne disease outbreaks. In Tajikistan, over 73% of the population lives in rural areas, with small systems being the main source of drinking-water. WHO/Europe and the Tajik government jointly implemented the project "Small and safe: scaling-up water safety planning and effective water quality monitoring in rural Tajikistan" since 2018. Key achievements include water safety plans (WSPs) introduced in five districts; a national WSP roadmap; a new drinking-water and sanitation law that incorporates the WSP approach; guidance for surveillance authorities on effective risk-based approaches to drinking-water quality monitoring; upgraded water quality monitoring equipment in the laboratories of partnering Sanitary Epidemiological Service offices; and rural communities increasing their understanding of the human right to water and the relationship between safe WASH behaviour and disease prevention.

Providing equitable access to water and sanitation in Armenia

In 2015-2016, Armenia applied the Equitable Access Score-card, a tool available under the Protocol on Water and Health. It was used to establish a baseline measure of the equity of access to water and sanitation, through self-assessment and disaggregated data collection. Key challenges were identified with respect to geographical disparities in access. Water supply was found to be a challenge for rural schools. The situation of vulnerable and marginalized groups was difficult, including because the legal framework did not define the terms vulnerable and marginalized groups. Armenia developed an Equitable Access Action Plan and the Water Code was revised to include the new definitions.

SDG TARGETS

6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all
6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations
6.b: Support and strengthen the participation of local communities in improving water and sanitation management

RESOURCES

WHO: Guidelines for drinking-water quality (https://www.who.int/water_sanitation_health/publications/drinking-water-quality-guidelines-4-including-1st-addendum/en/), flagship water safety plans, and WHO/UNICEF Hand Hygiene for All (https://www.who.int/initiatives/hand-hygiene-for-all-global-initiative). On WASH services: https://www.who.int/water_sanitation_health/en/.

UNICEF: One of the core mandates for children is the realization of human rights to water and sanitation. More information on UNICEF's WASH Strategy and interventions at: https://www.unicef.org/wash/

UNECE and WHO/Europe service the Protocol on Water and Health: https://unece.org/environment-policy/water/protocol-on-water-and-health/about-the-protocol/introduction.

OHCHR: Right to water and sanitation toolkit: https://www.ohchr.org/EN/Issues/ESCR/Pages/Water.aspx

[78] https://www.euro.who.int/en/health-topics/environment-and-health/water-and-sanitation/country-work/safe-drinking-water-and-effective-water-quality-monitoring-in-rural-tajikistan

CATEGORY: **Water**

MEASURE 15

Support sustainable water management by increasing water-use efficiency across sectors and through ensuring sustainable withdrawals and supply of freshwater to reduce the number of people suffering from water scarcity

BENEFITS

Quality of water and water supplies are essential to support health and livelihood conditions and economic development. The analysis in The United Nations World Water Development Report 2016 estimates that 42% of the world's total active workforce are heavily water dependent.[79] Investments in infrastructure and operation of water-related services can provide high returns for economic growth and for direct and indirect job creation. Water investments can also lead to production systems that are more labour intensive (e.g., in building and operating infrastructure for irrigation and water supply, distribution and treatment). Sustainable water management is also an essential driver of green growth and sustainable, inclusive development. Not investing in sustainable, climate resilient water management may, on the other hand, present costs related to disruption of water resources, declining crop yields and food stocks, severe disease outbreaks, and an increase in conflict and in numbers of refugees and internally displaced persons.[80]

BRIEF DESCRIPTION

Quality and quantity of available water are affected by pollution of water resources, water withdrawal by different sectors,[81] sedimentation affecting aquatic ecosystems and the effects of climate change. In Central Asia, it is estimated that climate change will result in the reduction of available water resources in the northern plains by 6-10% by 2030, and 4-8% by 2050.[82] Many European countries have faced more frequent and severe droughts in recent years. Responding measures, interventions and tools for sustainable water management may be grouped in the following areas: *assessment of countries' available renewable water resources*, taking into account the potential impact of climate change; *legal and regulatory instruments* (for water resources, including ecosystem protection, for water quality control, withdrawal use and discharge, etc.); *accountable and transparent institutions* at national and sub-national levels; *economic policy instruments:* regulatory, such as tariffs, taxes and subsidies, or voluntary, such as certifications for environmentally friendly forms of productions (mainly for private sector); *financial mechanisms* for building and improving water related infrastructure (grants, loans, public-private partnerships); creation of new markets to stimulate demand for *green technologies and innovations* to increase water use efficiency and water storage; and *awareness and capacity building* to increase understanding of a need to protect and use water efficiently. Finally, a nexus approach allows understanding of the interactions between water, food, energy and water-related ecosystems in river

[79] https://reliefweb.int/sites/reliefweb.int/files/resources/243938e.pdf
[80] Text in this section is largely adapted from the UN Water, Water and Jobs, 2016 https://reliefweb.int/sites/reliefweb.int/files/resources/243938e.pdf
[81] On average, 44 % of total water abstraction in Europe is used for agriculture, 40 % for industry and energy production (cooling in power plants), and 15 % for public water supply. https://www.eea.europa.eu/archived/archived-content-water-topic/water-resources/water-use-by-sectors
[82] Water Security in Central Asia and the Caucasus – A Key to Peace and Sustainable Development

basins that can be vital for ensuring that different and often competing needs are met in a coherent manner.

CASE STUDY

Scaling up laser land levelling technology application in Turkmenistan[83]

In Turkmenistan, more than 90% of water resources are used in irrigated agriculture, the main supplier of agricultural products ensuring food security of the country and employment for the majority of the population in rural areas. All irrigated zones of Turkmenistan are exposed to the negative effects of climate change, such as erratic rainy seasons, longer periods of drought and high air temperatures that affect agricultural activities, but the key problem is the growing shortage of water resources. Due to the persistent practice of inefficient tillage and irrigation, most farmers use water resources excessively, which results in irrigated land being under constant threat of secondary salinization. The modern methodology of laser land levelling was applied to improve the efficiency of irrigated agriculture. This method allows the creation of the necessary alignment and correct slope of an irrigated field, thus ensuring uniform distribution of irrigation water throughout the field. Within two years of application, the quality of irrigation has significantly improved, the time of irrigation as well as manual labour use for irrigation was reduced, water saving reached 20-30%, and yield increased by 20-25%. Practical training for interested departments and farmers were held at research sites. In August 2019, the Ministry of Agriculture and Environmental Protection of Turkmenistan began the purchase of laser planners and field training courses are being held for tractor drivers to properly operate the equipment.

SDG TARGETS

6.4: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity

6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate

6.6: By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes

RESOURCES

UNECE serves as the secretariat for the Convention on the Protection and Use of Transboundary Watercourses and International Lakes. https://unece.org/environment-policy/water and https://unece.org/environment-policy/water/areas-work-convention/water-food-energy-ecosystem-nexus

UNESCO works to build the scientific knowledge base for sustainable water management through the Intergovernmental Hydrological Programme (http://en.unesco.org/themes/ water-security/hydrology), through leading the UN-wide World Water Development Report (http://en.unesco.org/themes/assessment-wwap-0) and through Water Centres and Chairs.

UNDP delivers its Water and Ocean Governance Programme through mechanisms such as the UNDP-GEF International Waters portfolio (https://www.undp.org/content/undp/en/home/programmes-and-initiatives/UNDP-GEF-International-Waters-Portfolio.html), Cap-Net UNDP, UNDP-SIWI Water Governance Facility, UNDP GoAL-Waters programme: www.cap-net.org; http://watergovernance.org/

[83] https://www.tm.undp.org/content/turkmenistan/en/home/stories/Scaling-up-laser-land-leveling-technology-application-in-Turkmenistan.html

CATEGORY: **Water, Climate action**

MEASURE 16

Support transboundary water cooperation to ensure the timely and sufficient availability of water resources as a prerequisite for the provision of safe water, sanitation and hygiene, economic development, climate adaptation, protection of ecosystems, peace and security

BENEFITS

Across the world, 153 countries share rivers, lakes and aquifers. Transboundary basins cover more than half of the Earth's land surface, account for an estimated 60% of global freshwater flow and are home to more than 40% of the world's population. However, arrangements for transboundary water cooperation are often absent. Only 17 countries have all their transboundary basins covered by operational arrangements for transboundary water cooperation.[84] Almost three decades of cooperation under the UNECE Water Convention[85] show that transboundary water cooperation requires efforts and resources, but can generate multiple benefits related to economic development, regional integration, energy security, sustainable agriculture, adaptation to climate change, protection of ecosystems, and peace and security.

BRIEF DESCRIPTION

Many river basin organizations have health and mutual assistance in their mandate and some already play an important role in coordinating and supporting actions by riparian countries for COVID-19 recovery. Long-term cooperation in transboundary basins can be strengthened through: (a) development of transboundary water agreements and joint institutions as key instruments to discuss transboundary water management, including water quantity, water quality and health aspects; (b) monitoring and effective information exchange to ensure reliable information to inform decision-making in transboundary basins; (c) joint adaptation to climate change and disaster risk reduction in transboundary basins through the development and implementation of transboundary adaptation strategies and plans as a way to promote better resilience of countries, basins and people; (d) assessments of water-food-energy-ecosystems nexus issues in a transboundary context as a way to identify intersectoral issues and address them through concrete policy solutions at regional, basin, country, and local levels. Various soft-law instruments have been developed in the framework of the Water Convention to assist governments and stakeholders in strengthening transboundary cooperation in the above areas. New soft-law instruments are under development to address such pressing issues as water allocation in a transboundary context, financing of transboundary water cooperation and development of legal frameworks for cooperation. Through its programme of work, the Convention provides support to countries and stakeholders in operationalizing and strengthening transboundary water cooperation in specific basins.

[84] Result from the first SDG indicator 6.5.2 monitoring exercise (2017–2018); UNECE, UNESCO (2018). Progress on transboundary water cooperation: Global baseline for SDG indicator 6.5.2. See https://unece.org/environment-policy/publications/progress-transboundary-water-cooperation-global-baseline-sdg

[85] UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes

CASE STUDY

Setting up legal frameworks for mutually beneficial transboundary water cooperation in the Chu-Talas River Basins[86]

In Central Asia, the sharing of water resources between upstream and downstream countries is particularly problematic, sometimes generating tension and insecurity. The cooperation on the Chu and Talas Rivers shared by Kazakhstan and Kyrgyzstan is a remarkable example of progress towards finding mutually beneficial solutions. The two countries concluded an agreement in 2000 and inaugurated the Chu-Talas Commission in 2006. The Commission is a mechanism for Kazakhstan and Kyrgyzstan to share responsibility for water infrastructure used by both countries. In the early 2000s, the Water Convention supported the establishment of the Commission. Since that time, the Convention in partnership with other organizations (OSCE, UNDP, GEF) continues to help the two riparian countries broaden their cooperation with an emphasis on integrated water resources management and joint adaptation to climate change.

Climate change adaptation in transboundary basins[87]

Facing the growing impacts of climate change in their transboundary basins, Parties to the Water Convention work together to identify possible solutions. They have developed the Guidance on Water and Adaptation to Climate Change,[88] which provides a roadmap on how to assess the impacts of climate change and jointly develop harmonized policies and measures for adaptation. A global network of basins working on climate change (some with a focus on water scarcity, others on floods) under the Convention helps countries to develop and implement joint adaptation strategies and exchange experiences. For example, in the Dniester River Basin, shared by the Republic of Moldova and Ukraine, the Convention supported development of the transboundary adaptation strategy and plan with a focus on the lower Dniester, which faces water scarcity and is the most vulnerable part of the basin to climate change.

SDG TARGETS

6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate

13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

RESOURCES

UNECE provides the secretariat for the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, which aims to ensure the sustainable use of transboundary water resources by facilitating cooperation; see guidance documents at https://unece.org/environment-policy/water and https://unece.org/publications/environment-policy/water

[86] https://unece.org/environment-policy/water/areas-work-convention/projects-central-asia
[87] https://unece.org/environment-policy/water/areas-work-convention/water-and-adaptation-climate-change
[88] https://unece.org/environment-policy/publications/guidance-water-and-adaptation-climate-change

CATEGORY: **Industry, Infrastructure**

MEASURE 17

Facilitate deployment of green technologies and innovations by investing in R&D, skills development, providing access to markets, technology transfer and greening the public procurement procedures

BENEFITS

Green technologies and innovations generally feature five characteristics: (1) high efficiency of energy and resource use, (2) low cost, (3) do not generate secondary pollutants, (4) use of renewable energy and/or materials, and (5) are beneficial to human health and ecosystems.[89] As such they address a number of critical issues, such as climate change mitigation and adaptation, increasing energy and resource demands, circular economy in general and sustainable waste management. Green technologies and innovations, if planned and developed in a smart way, can contribute to improving human welfare and social equity and reduce the risk of resource scarcities. In many countries they can improve domestic infrastructure, help reach underserved communities that lack or limited access to electricity, clean water and sanitation, but also to financial means and create jobs.

BRIEF DESCRIPTION

Green technology involves eco-innovation in products, processes and services. Among the possible areas, from where green technologies and innovations development and application are expected to come, are green energy, organic agriculture, eco-friendly textiles, green building construction and manufacturing of related products and materials to support green business. Addressing climate change while promoting sustainable economic growth will, however, require large-scale deployment of green technologies, especially across the sectors such as power generation, transport and energy use. Following the integration of green growth principles into the governments' recovery and development plants and policy processes, governments should invest in research and development (R&D), support commercialization, strengthen markets and foster technology diffusion. Special attention should be paid to supporting MSMEs, which are becoming the backbone of many economies and having the key role in innovation and R&D. In the EU for instance, they provide two out of three private-sector jobs and contribute to more than half of the total value-added created by businesses. Governments should support both development and adoption of green technologies by creating supportive regulations, including introduction of mandatory environmental standards in public procurement systems, facilitate access to public and private finance (e.g., green credit lines by local banks or subsidies to support the uptake of the technology), and provide for management and technical skills of both women and men. Technology transfer from developed to developing countries is a necessary part of this process. Such transfer should involve the process of sharing knowledge and adapting technologies to meet local conditions. Last but not least, awareness raising campaigns and incentives to drive demand for green products and services will need to be put in place.

CASE STUDY

International Centre for Green Technology and Investment in Kazakhstan[90]

In April 2018, Kazakhstan established the "International green technologies and investment projects Centre" NJC (Centre). The centre serves as an information, education and capacity-building hub. It covers seven main activity areas: power sector transformation, sustainable urban development, green business

[89] Shu-Yuan Pan, at all: Development and Deployment of Green Technologies for Sustainable Environment; *environments*, 2019

[90] https://www.greengrowthknowledge.org/big-e/kazakhstan-establish-international-center-green-technology-and-investment; https://igtipc.org/en/about

development, transfer and adaptation of green technologies and best practices, development of green funding, development of renewable energy sources, and capacity-building for green growth. The centre focuses primarily on the countries of Central Asia, Afghanistan, Azerbaijan, the Islamic Republic of Iran and Mongolia. The projects of the International Centre will involve national holding structures and development institutions, international financial organizations, leading world and Kazakhstani universities and research centres and NGOs.

"AquaRefining" technology – an alternative for ultra-pure lead production of batteries and other products[91]

AquaRefining™ is a technology that aims to meet the increasing production capacity of batteries, Internet data centres and energy production industries by providing systems that reduce environmental impact. The technology is water-based, non-pollutant and optimal in room temperature. The demand for metals and other materials that constitute raw material to manufacture tech products and batteries has been increasing. Lead, one of the materials in demand, is known not only for its high toxicity, but also for the environmentally invasive extraction process and for environmentally hazardous traditional purification process. Its accumulation in the environment is a human health and environmental hazard. The AquaRefining™ technology is based on a closed-loop methodology that can ultra-purify lead paste from recycled batteries. By using modular systems, it can increase overall lead production without increasing emissions from the process. The environmental impact and other challenges typically associated with smelters are considerably diminished. AquaRefining technology has been used in many countries around the world, including Europe, North America and East and South-east Asia.

SDG TARGETS

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

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

RESOURCES

UNIDO Investment and Technology Unit (BIT/ITU) implements technical assistance programmes together with national and international partner networks such as the Investment and Technology Promotion Offices, Subcontracting and Partnership Exchanges, International Technology Centres and Investment Promotion Agencies. https://www.unido.org/sites/default/files/2013-10/BIT_Brochure_Web_0.pdf

ILO: Produces policy-oriented research and provides technical assistance on skills for greener economies and sustainable enterprise development. https://www.ilo.org/skills/projects/WCMS_115959/lang--en/index.htm Read its recent report "Skills for a greener future: Key Findings" (2019). https://www.ilo.org/global/topics/green-jobs/areas-of-work/cas/WCMS_709121/lang--en/index.htm

[91] Yale-UNIDO Global Green Chemistry Initiative, Yale-UNIDO Technology Compendium, GEF-UNIDO, 2019. https://www.global-green-chemistry-initiative.com/technology-compendium Reference in this document to commercial companies or products does not imply any endorsement by the United Nations or its Member States; this reference is intended to be illustrative of private sector initiatives in green technologies.

CATEGORY: **Economic instruments**

MEASURE 18

Setting up systems for sustainable public procurement[92] to provide financial savings for public authorities and equip them to meet evolving environmental challenges

BENEFITS

Public procurement wields enormous purchasing power, accounting for up to 30% of GDP in many developing countries. Leveraging this purchasing power by buying more sustainable goods and services can help drive markets in the direction of sustainability, reduce the negative impacts of an organization and produce positive benefits for the environment and society.[93] Sustainable public procurement (SPP) can also be a major driver for (eco)innovation, providing industry with incentives to develop environmentally-friendly works, products and services. The following examples show benefits generated by European authorities through SPP: "The City of Vienna saved EUR 44.4 million and over 100,000 tonnes of CO_2 between 2004 and 2007 through its EcoBuy programme; CO_2 emissions would be cut by 15 million tonnes per year if the whole EU adopted the same environmental criteria for lighting and office equipment as the City of Turku, Finland - reducing electricity consumption by 50%".[94]

BRIEF DESCRIPTION

Sustainable public procurement needs to deliver the desired environmental, economic and social outcomes such as energy efficiency, emission reduction, waste prevention, local economic development and poverty reduction. Key obstacles to successfully implement SPP are the perception that green products and services are more expensive than conventional ones, public officials' lack of technical knowledge on integrating environmental standards in procurement, and the absence of monitoring mechanisms to evaluate SPP achievements. While it is true that some sustainable products and services cost more than traditional options (e.g., LED lighting compared to incandescent bulbs), the calculation of costs often changes when the entire life cycle of a product is considered. To have a functional SPP system in place countries need to take the following measures: definition of SPP criteria, regulations, policies and guidelines; setting up of the professional procurement team (institution); improvement of knowledge on SPP and its effectiveness as a tool to promote a greener economy; integration into processes and procedures; adoption of methodologies based on life-cycle costing; promotion and marketing of green products and services; and development of a monitoring system to evaluate progress. It is inevitable to engage private sector actors as they will have to react to the public sector's demand for more sustainable products and services, and because they can influence the market through their own procurement practices. The most typical categories where governments apply SPP are purchases of office IT, office paper and stationery, vehicles, cleaning products and services or furniture.

CASE STUDY

Introducing green criteria for contracting cleaning services in Romania

The National Environmental Guard (GNM) is responsible for law enforcement and compliance in Romania. GNM is one of several authorities within Romania's Ministry of the Environment, which is supporting the

[92] Also referred to as 'green public procurement (GPP)'.

[93] UNEP, *Global Review of Sustainable Public Procurement 2017*

[94] https://ec.europa.eu/environment/gpp/benefits_en.htm

uptake of SPP in the country. GNM decided in 2017 to "green" its tender for cleaning services (for its 35 offices) by introducing specific requirements for environmentally friendly cleaning products, toilet paper and paper towels. Green specifications were derived from the EU Ecolabel and the Romanian SPP Guide. The technical offer had to comply with the quality control system (ISO 9001 or equivalent) and with environmental management (ISO 14001) standards. The winning contractor provided the cleaning service using products carrying the EU Ecolabel. The specific cleaning method (pre-impregnation) ensures a higher level of hygiene, reduces water consumption by about 75%, results in lower consumption of detergents and leads to a reduced amount of wastewater discharged in sewerage networks. The case encouraged GNM to develop a systematic process for conducting SPP. GNM is currently developing a SPP National Action Plan. GNM's plan will be based on a series of market consultation actions aimed at prioritizing the products and services that should be purchased through a green procurement process.

Greening Economies in the EU Eastern Neighbourhood

The EaP GREEN project, funded by the EU and implemented by OECD, UNECE, UNEP and UNIDO, supported, besides other countries and actions, the introduction of SPP in the Republic of Moldova and Ukraine.[95] It resulted in the elaboration of national SPP handbooks and policies, analysis of market readiness and the prioritization of product categories (for pilot tenders). In Ukraine, there are 28 successful tenders, as of May 2018.

SDG TARGETS

8.4: Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead

12.7: Promote public procurement practices that are sustainable, in accordance with national policies and priorities

RESOURCES:

UNEP supports public authorities in partner countries with introducing SPP frameworks. https://www.unenvironment.org/explore-topics/green-economy/what-we-do/economic-and-fiscal-policy/fiscal-policy/policy-analysis-1

UNECE adopted recommendations on sustainable procurement to advance responsible business practices in May 2019. https://unece.org/trade/publications/recommendation-43-sustainable-procurement-ecetrade451

UNIDO supports countries in establishing national road maps for greening the supply chain, determining benchmarks and indicators, disseminating and sharing best practices, running clean technology programmes. https://www.unido.org/our-focus/safeguarding-environment

[95] http://www.green-economies-eap.org/resources/EaPGREEN_BR_UPDATED%20AND%20FINAL_NOV27_WEB.pdf

CATEGORY: **Fiscal measures**

MEASURE 19

Facilitate governments in enabling climate finance for applying green bonds – instruments specifically earmarked to raise money for climate and environmental projects

BENEFITS

Green bonds are like any other bonds except that the issuer promises to use the proceeds for green investments, green projects or eligible green assets being refinanced. As such they present an instrument that helps to finance any project or initiative that is relevant to our transition to a low-carbon economy and to address new environmental challenges. The International Energy Agency suggests using several tools, including green bonds, in order to achieve the target of US$53 trillion in clean energy investment needed by 2035 to keep global warming under two degrees. Green bonds can advance adoption of innovative new technologies, finance projects that provide green jobs, and promote economic and climate resiliency across regions.[96]

BRIEF DESCRIPTION

Green bonds started off as a tool to mainly finance renewable energy projects. They are now used to help finance any project or initiative in the areas of green buildings (energy efficient buildings), water investments and even agriculture. Green bonds provide governments with a chance to brand themselves as forward thinking, innovative and sustainable. Their role is not to fully fund, but to enable the climate finance for their application. That means sorting out economic and energy planning and then to reduce key risks — notably government-related policy risk — enough to deliver secure long-term investment returns. “Capital steerage” is how to channel private capital towards low carbon investment. Governments can use capital steerage tools and instruments to create a deal flow that fits these size and risk investment preferences, but that is also green. A key point to emphasize is that it is largely green infrastructure that is needed, and governments have played a role in mobilizing capital for various infrastructure investments for centuries. Therefore, many existing and well-proven tools can be used by policymakers to increase green investment through the bond market. Policies both on the demand side and supply side of green bonds play a role to grow the green bonds market and increase investment in climate solutions. There is a high demand for low risk investments, as institutional investors with relatively low risk-return profiles dominate the bond markets. However, green investments are often perceived as a “novelty”, which means higher risk is attached to the investments, and investors therefore require higher returns – or become reluctant to invest. In order to reduce the perceived risk, governments need to put in place policies to reduce the risks and make them investment grade.[97]

CASE STUDY

Sovereign Green Bonds: Poland sets a precedent

2017 was marked as “the year of the sovereign” in the green bond market, with inaugural issuances from Poland (and France) setting a precedent in late 2016. Investments deriving from Poland’s green bond are

[96] More information on benefits for both investors and issuers of Green Bonds are at: http://www.gogreenbonds.org/why-green-bonds/

[97] Text in this section is adapted from The Climate Bonds Initiative, which has identified a range of policies for policymakers to support the growth of a green bonds market. https://www.climatebonds.net/policy/policy-areas

to help achieve Poland's National Renewable Energy Action Plan, targeting 15% renewable energy consumption by 2020, and the creation of carbon sinks through its National Programme for the Augmentation of Forest Cover. The green bond issuance was led by the Public Debt Department, with the collaboration of multiple departments in the Ministry of Finance, responsible for processing data from other Ministries and other Government Agencies of Forest Cover. Six eligible sectors were identified: renewable energy, clean transportation, sustainable agriculture operations, afforestation, national parks and reclamation of waste heaps. The sectors are aligned with the broad categories included in the Green Bond Principles. Eligible expenditures include budget allocations (including excise tax exemptions), subsidies and projects. Eligible expenditures will be approved by the State Treasury, represented by the Minister of Development and Finance. According to Sustainalytics, Poland's green bond framework is a step towards achieving its objective of transitioning to a low-emissions economy. The proceeds of the bond will have clear positive environmental impacts and the framework report was to be robust, credible and transparent. The bond was issued in December 2016. A EUR 500m issuance was targeted, and finally upsized to EUR 750m.[98]

Transport for London's green bond[99]

Transport for London (TfL) is the owner and operator of the largest integrated transport network in Europe and was one of the first issuers of a green bond in the United Kingdom. Proceeds from this green bond are used to fund low-carbon transport projects from TfL's business plan through to 2021, including station and line upgrades on the London Overground and Underground networks, low-emission hybrid buses and cycling improvements. Resultant carbon savings are important: for example, every US dollar invested in rail infrastructure results in between three and 10 times less CO_2 than for the equivalent spend on roads. The project also helped alleviate pressure on air quality, overcrowding and noise, while enhancing safety for Londoners.

SDG TARGETS

8.10: Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all

17.1: Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection

RESOURCES

Climate Bonds Initiative is an international, investor-focused not-for-profit. They are the only organisation working solely on mobilising the US$100 trillion bond market for climate change solutions. https://www.climatebonds.net/.

UNDP Financing Solutions for Sustainable Development and its partners meet the significant demand for guidance on identifying and operationalizing financing solutions across many sectors and thematic areas. For information on green bonds go to https://www.sdfinance.undp.org/content/sdfinance/en/home/solutions/green-bonds.html.

ILO: through its Social Finance Programme, ILO supports efforts to strengthen financial services and investments to promote better jobs, reduce vulnerabilities and advance sustainable development https://www.ilo.org/empent/areas/social-finance/lang--en/index.htm

[98] https://www.climatebonds.net/files/files/Sovereign_Briefing2017.pdf
[99] https://www.columbiathreadneedle.co.uk/insights/2019/07/case-study-transport-for-londons-green-bond

CATEGORY: **Fiscal measures, Economic instruments**

MEASURE 20

Create strategic framework for applying green budgeting tools to increase the efficiency and effectiveness of budgetary processes and align them with environmental sustainability objectives

BENEFITS

Green budgeting can help facilitate the implementation of post-pandemic green recovery packages. Incorporating environmental dimensions into fiscal frameworks, including the annual budget document, evaluation of tax and expenditure policies and long-term sustainability analysis, will help governments to become more accountable for their environmental commitments and support them in transforming towards sustainable and resilient societies. Well-communicated spending and tax policy choices that look at long-run benefits in terms of people's well-being, environmental protection and resilience to climate change and future shocks can increase public acceptance. By contrast, recovery packages that leave the longer-term decarbonisation objectives aside risk pushing societies and businesses towards consumption and investment choices that will delay the transition towards a low-carbon future and increase the costs of the transition both for business and society.

BRIEF DESCRIPTION

The SDGs, the Aichi Biodiversity Targets and the UN Convention to Combat Desertification, among many other commitments, all demand urgent action— and budgets. Yet, between 2010 and 2015, fossil fuel subsidies amounted to US$373-617 billion annually across 76 economies, which collectively contribute 94% of global CO_2 emissions.[100] In contrast, the amount that governments spend on biodiversity, estimated at about US$50 billion per year, is approximately one tenth of the spending on fossil fuels.[101] Green budgeting can be a valuable tool to increase the efficiency and effectiveness of budgetary processes and align them with environmental sustainability objectives. Regardless of the national circumstances and stage of development, an effective approach to green budgeting is underpinned by four mutually reinforcing key building blocks: 1. *Strong strategic framework*; the government's strategic priorities and objectives relating to the environment and climate have to be clearly set out to help inform fiscal planning and guide tax and spend decisions (e.g., in national climate change or environmental strategies). 2. *Tools for evidence generation and policy coherence* gather evidence on how budget measures impact environmental and climate objectives. These may include: Green budget tagging; Environmental impact assessments; Ecosystem services, including carbon, pricing; Green perspective to spending review; and Green perspective in performance setting; 3. *Reporting to facilitate accountability and transparency*; Adequate reporting to relevant stakeholders (e.g., parliament and civil society) facilitates scrutiny of the quality and the impact of green budgeting. For example, a Green Budgeting Statement accompanying the budget helps to provide an overall picture of how the budget is aligned with green objectives in any given budget year. 4. *An enabling budgetary governance framework;* This includes a budgetary framework

[100] https://www.oecd-ilibrary.org/energy/oecd-companion-to-the-inventory-of-support-measures-for-fossil-fuels-2018_9789264286061-en

[101] https://www.greengrowthknowledge.org/blog/paris-collaborative-green-budgeting-joining-forces-towards-our-green-commitments

where there are links between strategic planning and budgeting, multi-annual budget envelopes, outcome and evidence-based budget processes, along with close engagement with parliaments and civil society.[102]

CASE STUDY

How green budget tagging supported the design of a green recovery package in France[103]

France has recently developed a comprehensive approach to green budget tagging initiated from its participation in the OECD's Paris Collaborative on Green Budgeting. This involves classifying budget lines according to their impact (either positive or negative) on six environmental objectives: climate change adaptation, climate change mitigation, biodiversity and sustainable land use, circular economy and risk prevention, water resources management and pollution abatement. The analysis was presented for the first time as part of France's Budget for 2021. France was able to use its new approach to green budget tagging to support the design of its recovery plan, announced in September 2020. The French Government set an objective of having 30% of the EUR 100 billion "Plan de Relance" allocated explicitly to green measures. Green budget tagging was carried out in relation to the initial planned expenditure. This allowed the Government to identify expenditure measures that would help France meet its objective of having EUR 30 billion dedicated towards the green transition. It also allowed the identification of harmful expenditure measures that were counter to France's environmental and climate objectives.

Incorporating environmental considerations in long-term fiscal sustainability analysis in Germany[74]

The 2009 study, commissioned by the Ministry of Finance, uses different scenarios of socioeconomic and climate development to examine potential impacts of climate change on Germany's fiscal sustainability. The report includes a qualitative and quantitative assessment based on 10 case studies covering the most affected sectors (buildings, agriculture and forestry, energy, water, tourism, transport, insurance and health) and two cross-sectoral ones on sea-level rise and the importance of international influences.

SDG TARGETS

8.10: Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all

17.1: Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection

RESOURCES

OECD launched The Paris Collaborative on Green Budgeting in 2017, to drive improvements in the alignment of national expenditure and revenue processes with climate and other environmental goals. For more information see http://www.oecd.org/environment/green-budgeting/

Joint UNEP, ILO, UNIDO, UNDP and UNITAR Partnership for Action on Green Economy (PAGE) supports nations and regions in reframing economic policies and practices around sustainability to foster economic growth. For more information see https://www.unep.org/explore-topics/green-economy/what-we-do/partnership-action-green-economy

[102] Text in this section is adapted from the: Paris Collaborative on Green Budgeting: OECD Green Budgeting Framework – Highlights, http://www.oecd.org/environment/green-budgeting/OECD-Green-Budgeting-Framework-Highlights.pdf

[103] http://www.oecd.org/coronavirus/policy-responses/green-budgeting-and-tax-policy-tools-to-support-a-green-recovery-bd02ea23/