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Susanne Luther (Hrsg.)

CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT

The Need for International Cooperation

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PREFACE

|| Susanne Luther

Dear readers,

"We are unanimously convinced that rapid, radical redressment of the present unbalanced and dangerously deteriorating world situation is the primary task facing humanity. (…) This supreme effort is a challenge for our generation. It cannot be passed on to the next. The effort must be resolutely undertaken without delay, and significant redirection must be achieved during this decade."[1] This statement comes from the seminal work "The Limits to Growth", published by the Club of Rome in 1972.

Half a century later, following the discussions on the outcome of the 26th Conference of the Parties in Glasgow past November, the paragraph above seems vaguely familiar, as one of the main statements of the final document "stresses the urgency of enhancing ambition and action in relation to mitigation, adaptation and finance in this critical decade to address the gaps in the implementation of the goals of the Paris Agreement".

Another noteworthy message from the "Limits to Growth" states: "if the global society waits until those constraints are unmistakably apparent, it will have waited too long." And indeed, in recent years, climate change has developed from being a vague future scenario with no immediate effects, to a visible catastrophe that can be directly experienced, even in the northern hemisphere. In recent years, no one could escape the images of extreme and unprecedented weather events like floods, storms, severe heatwaves and droughts, the burning Amazon forest and wild fires in the US, Australia and Southern Europe; not to speak of the fact that we find ourselves amidst a mass extinction of species which is linked to the changes in climate and environmental degradation.

Have we waited too long? Although there has been much movement in climate politics in the past few decades, some scientists believe that some self-reinforcing tipping points in the Earth system will be reached sooner than expected, thus making climate change irreversible and ever increasing in speed. What we will face, when the targets of the Paris Agreement will not be met – a recent study projects an average rise in temperature between 2,2° and 2,9°[2,3] – is hard to imagine. But some of the expected impacts will become reality within our, or our children's, lifetime. Within this setting, developing countries – which contribute and have contributed least to climate change – are among the ones that already feel the worst effects.
For these reasons, the focus of climate science in all relevant areas of life and increasingly also in politics, lies not only on preventing or slowing down climate change, but also on concrete measures to mitigate the already noticeable effects of climate change and to strengthen societies' resilience.

Many developing countries are only at the beginning of full industrialisation. Since development in its traditional form is often still interpreted as economic growth via industrialisation and thus is following the traditional Western paradigm of modernisation, this will further accelerate global warming and environmental degradation. It is a task for all na-

tions and for all actors in the field of development to think ahead and leave beaten paths. It is also a task to think boldly about new – or old – proposals for economic models that do not focus only on economic growth as a desirable outcome and indicator for development.
Against this background, it should be emphasised that among the main drivers of climate change are industrial production, energy and heating, agriculture and forestry, and global and individual transport. This means that for a sustainable future, virtually all areas of human life will be under scrutiny and, in the best case scenario, will have to be rethought.

But although the likely consequences of global warming and rampant environmental degradation have been known for many decades, it seems to be part of human nature to easily brush aside even the logically and scientifically obvious when the consequences are unclear and the required actions inconvenient, and on first sight mean giving up some comfort and consumption on the individual level. Moreover, across the political spectrum, short-term issues that require immediate political attention – such as tackling the COVID-19 pandemic, economic emergencies or geostrategic challenges – seem to distract from humanity's most pressing problem. Not to mention that any structural change, even if it leads to the frequently invoked win-win scenario, means hard work first and foremost.

This issue of “Argumente und Materialien der Entwicklungszusammenarbeit” (Arguments and Materials for Development Cooperation) deals with questions such as how the consequences of climate change are affecting people and societies in our partner countries, which adaptation strategies are needed and which political, social and economic instruments are being used to achieve the climate- and sustainable development goals.

Adi Wolfson, Ofira Ayalon, and Yoni Sappir contribute an article focusing on the ramifications in the State of Israel. Their paper describes actions needed to fulfil Israel’s greenhouse gases reduction goals for the benefits of the people of Israel, the world and future generations – yet, so far, the authors consider Israel's goals and performances as very limited.

The article "The EU as a global leader on climate action between ambition and reality" examines the ambitious EU policy initiative unveiled by the Commission in 2019, which has the potential to drive global climate action efforts and give the EU a real leadership role on the world stage, but also the limits of the European Union's room for manoeuvre.

Christoph Rapp from the Technical University of Munich (TUM) and Christian Springer from the University of Applied Sciences (UAS) Erfurt present an example of an experimental knowledge exchange project in hydraulics, "Lab-in-a-Bag", on which partners from Tanzania and Germany have been working since April 2021. The project is easily replicable, and set within the framework of an experience-based teaching concept, focusing on the central role water plays in global warming processes.

Magnus Bengtsson, Patrick Schröder & Michael Siegner present the concept of circular economy in the article "Building back better through circular economy – opportunities for ASEAN countries", especially its relevance for low and middle income countries. It shows why circular economy practices should be part of the ASEAN region's recovery from the COVID-19 pandemic to help build economies that are both more inclusive and resilient.

Shi Gendong, the executive director of the UNESCO Chinese National Working Committee on Education for Sustainable Development (ESD) describes the achievements made in ESD in China. As theoretical research and innovatory practice go deeper, he envisages ESD to become a distinctive mainstream strand in the overall onward advance of the modernisation of education nationwide and serve as important arenas for innovation.

Hyun-Ah Choi and Bernhard Seliger discuss South Korea’s ambitious Green New Deal,

which won worldwide acclaim, even when details of it were still unknown. When the COVID-19 pandemic hit the world, South Korea was one of the first countries answering with a large-scale deficit-spending programme at the same time purporting to tackle the issue of growth and green transformation.

In his article "Climate Action and the Indian Imperative", Sandeep Kumar Dubey focuses on climate finance and water governance. He argues that climate finance and technology transfer from developed to developing countries are not enough to bridge the capability gap as the focus is one-sided on climate change mitigation actions. He tries to explain why it is important for India to raise its ambition on climate change by improving climate finance mobilisation, developing adaptation technologies and strengthening its climate policy.

With a focus on Africa, Daniel Seiberling gives a brief introduction of the Hanns Seidel Foundation's Regional Sustainability Network (RSN), followed by an extensive review on "the Role of Civil Society Organizations and Networks in Advancing and Achieving the Paris Agreement and Sustainable Development Goals".

In this article, Sixbert Mwanga provides an overview of the role played by CSOs in Tanzania to advance and achieve the United Nation Framework Convention on Climate Change (UNFCCC-Paris Agreement) and SDGs targets.

This edition concludes with an interview conducted by Barbara Kahatjipara – "Ahead of the COP26: Namibias fight for climate change mitigation and adaptation". Bernadette Shalumbu-Shivute, Jonathan Kamwi, and Clemens von Doderer discuss the prospects for Namibia, which is severely affected by climate change. Since the country has huge potential for renewable energies such as solar energy, there are opportunities for a sustainable, "green" growth, also in the context of post-COVID recovery.

Dear readers, the way ahead will not be easy. But despite the undeniable challenges, international cooperation on climate and environmental issues have, and hopefully will pave the way for more understanding between cultures in our common concern for our people and the planet. The Hanns Seidel Foundation is strongly committed to issues of environmental sustainability, both in Germany and in our project offices in 74 countries around the world. In cooperation with and as a mediator between civil society and politics, we will play our part and do our best to advance the agenda for a sustainable future.

I wish you an interesting read.

|| **Dr. Susanne Luther**

Leiterin des Instituts für Internationale Zusammenarbeit der Hanns-Seidel-Stiftung

NOTES

1 Meadows, d. et al. (1972) The Limits to Growth. A report for the Club of Rome's project on the predict ament of mankind. Universe Books, New York

2 Sognnaes, I., Gambhir, A., van de Ven, DJ. et al. A multi-model analysis of long-term emissions and warming implications of current mitigation efforts. Nat. Clim. Chang. 11, 1055–1062 (2021). URL https://www.nature.com/articles/s41558-021-01206-3

3 The Monitoring Report 2019 on the German Strategy for Adaptation to Climate Change confirms that average rise in temperature has already reached 1,5°C. See Monitoringbericht 2019 zur Deutschen Anpassungsstrategie an den Klimawandel Bericht der Interministeri ellen Arbeitsgruppe Anpassungsstrategie der Bundesre gierung URL https://www.bmuv.de/fileadmin/Daten_BMU/Download_PDF/Klimaschutz/monitoringbericht_2019_bf.pdf

INHALT

Adi Wolfson, Ofira Ayalon and Yoni Sappir

The need for deeds: A call for proactivism in Israel‘s climate policy

The ‘climate crisis’ is now the greatest threat to the Planet Earth and to all Humanity. Climate change is not a theoretical, scientific matter — it is happening here and now. Due to its geographical location, the climate crisis is expected to have very extreme ramifications in the State of Israel. Yet, so far, Israel‘s goals and performances are very limited. In this paper we describe the actions needed to fulfill Israel’s modest GHG reduction goals for the benefits of the people of Israel, the world, and future generations

Keywords:
Climate change - Israel - mitigation - adaptation - Paris Agreement - National Goals - GHG Reduction - Electricity Sector - Transportation Sector - Industrial Sector

The need for deeds: A call for proactivism in Israel's climate policy

|| Adi Wolfson, Ofira Ayalon and Yoni Sappir

Introduction

The State of Israel was founded in 1948. As of 2021 the population is approximately 9.4 million people living on 22,000 square kilometres of land. Israel, situated in the Middle East, is a transitional region, between a desert climate and a Mediterranean one; as such, it has a unique variety of biological species and valuable nature. In addition, Israel, being surrounded by neighbouring countries, some of which have undeveloped infrastructures, is, in fact, an island of water, energy and other infrastructures.

Since its establishment, Israel has undergone similar processes to those that have occurred elsewhere in the world, but they happened over a shorter time-period and in a more intensive manner. By the mid-20th century, Israel's local economy was primarily based on commerce and traditional, mechanized agriculture, though heavy industrial processes were not yet being conducted across the country. During the 1960s and 1970s, Israel underwent an accelerated process of development that included an intensive transition to intensive agriculture, industrialization and the construction of many different infrastructures, alongside population growth and rapid urbanization processes.[1] All these, as well as the unsupervised dumping of waste products and sewage, caused – within a relatively short period of time – serious damage to human health, the environment and biodiversity, due to the pollution of the soil, the air and sources of water and the sea. In order to enable a sustainable progress and economic growth, in 1968, within the framework of Israel's "National Research Council," the "National Committee for Water Quality" was founded, becoming (after two years) the "National Committee for the Biosphere and Environmental Quality." In 1973, the Israel Prime Minister's Office established the "Environmental Protection Service" and, in 1988, the Ministry of Environment was founded, changing its name to Ministry of Environmental Protection (MoEP) in 2006.

Nonetheless, the early environmental legislation in Israel was not well-developed and its enforcement was as lax as the national investment in ecological issues was meagre. During the 1960s, and even more so during the 1970s, civil awareness began to grow regarding the matter of environmental protection. Various environmental organizations were founded in Israel that – over the years – dealt with relevant legislation, enforcement and public struggles. This global and local awakening followed in the wake of the Brundtland Commission's report, published in 1987 by the "World Commission on Environment and Development" and well known for its definition of the term "sustainable development".[2]

The environmental conditions and challenges related to the insufficiency of the natural resources in the tiny country of Israel were, and still are, unique, and often led to the development of innovative, groundbreaking solutions, like new methods for water desalination and sewage treatments, as well as novel drip-irrigation and forestry techniques.[3] Similarly, in order to reduce the need to import energy sources for the production of electricity and to better utilize existing natural resources, the sunny State of Israel also pioneered the field of solar energy, including a mandatory placement of solar water-heaters on rooftops back in 1980.

This document summarizes the goals of the Government of Israel in regard to the reduction of Israel's carbon footprint and presents data and recommendations that have previously been submitted to various Israeli Government Ministries, national authorities and also to research bodies and other relevant private and public organizations, for the purpose of promoting policies for sustainable development and climate remediation in Israel over the upcoming decades.

The Global Climate Crisis

The 'climate crisis', referring to the frequent and extreme climatic changes happening on Earth these past few decades, is now the greatest threat to the Planet Earth and to all Humanity.[4] Its effects are clear and tangible. Already today, the destructive impact of extreme climatic events on both the natural environment and Humanity caused by rising temperature is unmistakable: heat and cold waves; melting glaciers; rising sea levels; floods and mudslides; droughts as well as damages to agricultural crops and more.

To cope with this crisis and to prevent a further rise in the average temperature caused by the accelerated emission of greenhouse gases (GHGs) produced by human processes, a wide range of local and global actions have been taken in the recent years and innovative technologies to reduce the release of GHGs or, contrarily, to intentionally capture and store GHGs have been developed.

In 2015 the U.N.'s "Paris Climate Agreement" was adopted[5] in order to establish quantitative goals for the reduced emission of GHGs and the allocation of means for the funding of the required actions to that end. The Agreement set a goal to limit the increase in world temperature to 1.5°-2° C by the end of the century, compared to the period before the Industrial Revolution – rather than suffering the predicted 4.5° C rise, if a 'business as usual' approach is taken. In fact, this would mean that it is necessary to reduce about 50% of all GHG emissions by the year 2030, relative to the levels in 2010. Furthermore, a recently published comprehensive report[6] by the U.N.'s Intergovernmental Panel on Climate Change (IPCC) stated unequivocally that not only is Humanity responsible for causing the climate crisis, but that it also has far-reaching ramifications on the Earth's atmosphere, hydrosphere and biosphere, as well as on daily socioeconomic factors. This report added that, in the next few decades, we should already expect a 1.5° C rise in temperature and that the many changes occurring in the oceans and on land may not be prevented and will become irreversible for many hundreds or thousands of years. Therefore, it is necessary to unite all the global efforts to reduce GHG emissions and to moderate global warming post-haste.

Beyond the significant impact of the climate crisis on the natural environment, it also produces long-range social and economic effects. Climate change causes deaths, the spread of diseases, damage to property as well as conflicts over natural resources and the migration of refugees and more. The climate crisis influences economic parameters, such as the prices of goods, trade agreements, economic performances, competitive national economies and inequality. Over the past few years, more than 120 countries have presented their plans for the promotion of a zero-carbon economy by the year 2050. These plans include enormous investments in new infrastructures for energy, transportation, agriculture and in the employment sector and more, alongside regulation and legislation, such as enacting a "Climate Law" and/or the imposition of a 'Carbon Tax', as well as the

innovative development of climatic and environmental technologies.

The Climate Crisis and the State of Israel

Due to its geographical location the climate crisis is expected to have extreme ramifications in the State of Israel. According to the Israel Meteorological Service, "the average temperature in Israel has risen by about 1.4° C over the period from 1950 to 2017 and is expected to increase by a few more degrees by the year 2050, with this rise in temperature being especially blatant during the summer seasons."[7] Moreover: "It seems that in the worst case scenario, the average temperature in Israel is expected to rise another 4° C by the end of this century… Apparently, the summer's low temperatures will rise by 5° C, assuming the worst scenario."[8] All this will lead to the ongoing decline of precipitation and a shortening of the rainy season. Furthermore, the warming of the Mediterranean Sea (forecast for +2.97 °C by 2070)[9] will add. According to another report by a network of Mediterranean Sea climatic and environmental experts, the water temperature in the Eastern Basin is rising at a quicker pace and will increase by another 3° C by the end of the century, at the very least – if not sooner.[10] These data oblige the State of Israel to prepare for changes and to develop plans for adaptation on the national and local governmental levels. They will have to plan their mobilizations for scenarios including flooding, fires, heat and cold waves, urban heat islands, etc.[11]

As recorded by the Israel Central Bureau of Statistics (CBS), in 2016 (the most recent year for which the CBS has provided official data on GHG emissions), the absolute GHG emissions from the State of Israel were 79,951 thousand tons, relatively low compared to other countries. Yet, the emissions *per capita* in Israel were relatively higher than those measured in most of the European countries. While OECD countries reduce their absolute GHG emissions, Israel has failed to honour its modest pledges.[12] As will be discussed later, Israel has pledged to reduce its GHG on *a per capita* basis, which is likely to increase the total emissions, as the population grows.

Indeed, since the discovery of natural gas (NG) off the coast of Israel in 2009, the State pinned all its hopes on the transition to the use of NG, defined the world-over as being a temporary, transitional fuel source, for use in producing electricity, mobile transportation and other industries – a process that actually only postpones progress and the application of a real transition to renewable energies, especially solar energy in the case of Israel. Note that a reduction in GHG emissions related to energy in the national economy will not hinder Israel's long-term growth goals – on the contrary, it will produce both direct and indirect benefits, such as the reduction of air pollution, increased energy efficiency and an increase in jobs. Thus, the reduction of GHG emissions may bring a real increase in Israel's gross domestic product (GDP) and improved social welfare.[13]

Climate change is also a **security threat** to the State of Israel. According to a report by the Institute for National Security Research, the most significant risks to Israel's national security will be outcomes of climatic changes, like rising temperatures, reduced precipitation and the rising sea levels that will be experienced by neighbouring countries less fortified and less prepared for these changes. Especially weak and divided states, lacking suitable means for coping with such climatic trends will be adversely affected,[14] and will add to existing tensions regarding ethnic, social and economic conditions, particularly when living under unstable regimes. Therefore, climate crisis is a crucial factor for any national security agenda and preparedness actions.

National goals for emission reduction

The State of Israel is small and crowded. Recently, a special report provided a peek at the way in which the State of Israel will probably look in the year 2050.[15] The forecast is that 18 million citizens, crowded high-rise and underground urban construction, and a significantly different Israeli social structure

will characterize the State. Additionally, it is important to note that Israel's economic performances have ranked the country in line with the world's developed states, but that it also shares many demographic and social characteristics with developing countries, including high population growth.

Although the State of Israel had pledged that it would reduce its GHG emissions within various international frameworks even before the "Paris Climate Agreement," signing that Agreement meant committing to begin reducing them immediately, as ratified by the Israeli Government in September 2015.[16] The goals that were approved are:

1. By 2025, the emission of GHG *per capita* should not exceed 8.8 tons; by 2030 – 7.7 tons *per capita*; that is to say, a reduction of 26% of GHG *per capita*, compared to 2005.
2. A reduction of at least 17% in the consumption of electricity by 2030, as opposed to the anticipated consumption for that same year, if a 'business as usual' approach is taken until then.
3. The production of electricity from renewable resources would be 13% of the total production of electricity by 2025, and 17% or less of the total consumption of electricity by 2030.
4. A reduction of 20% in private mileage by 2030, in lieu of the expected private mileage for that same year, if a 'business as usual' approach is taken until then.

By the end of 2020, the Israeli Government approved the increased production of electricity from renewable resources until 2030, from 17% to 30%.[17] However, it is worth noting that, once again, Israel did not even meet its prior, much lower, renewable-energy goals. In 2020, electricity produced in Israel from renewable resources, primarily from solar energy, was only 6%.[18] Likewise, in July 2021, as part of the "Paris Climate Agreement," the Israeli Government ratified a national, low-carbon, economic programme with long-term goals, as follows:[19]

1. The State of Israel recognizes the importance of reaching the goal of zero GHG emissions by 2050, in accordance with the "Paris Agreement," and accepts its international obligation to prevent the crossing of the global warming tipping point – 1.5° C. Going forward, the Government would, from time to time, reassess the reduction goals it had set itself in this decision.
2. The national goal to reduce GHG by 2030 should be regularly updated, such that the annual GHG emissions in 2030 will be at least 27% less than it was in 2015, when the amount was about 79 million tons.
3. A national goal should be set for the reduction of GHG emission by at least 85% less than it was in 2015 in the year 2050. In line with the above, the annual GHG emissions in 2050 should only be about 12 million tons.

To attain those national goals, Israel determined sectorial goals for the reduction of GHG emissions and strove to make energy use more efficient, as detailed below. It was also attested that earmarked budgets have been allotted for 2021-2022. Within the parameters of this proposed budget, the MoEP was granted the sum of 625 million NIS (New Israeli Shekels, 3.8 NIS per 1 Euro) towards the preparation of a plan for the combating the climate crisis.[20] Meanwhile, the Energy Ministry was awarded an unprecedented investment of over 2 billion NIS for the coming decade, for the benefit of plans to become more energy efficient, to develop self-sustaining energies and to switch to the use of 'green' energy; this, in addition to 700 million NIS for energy-efficiency grants, 130 million NIS for establishing the Joint Energy Institute (together with academic institutions), and 100 million NIS with the application of the programme to prepare local authorities for climatic changes.[21]

Notice that all these governmental decisions above are not anchored by legislation and their budgets have not yet been ratified.

Actions needed

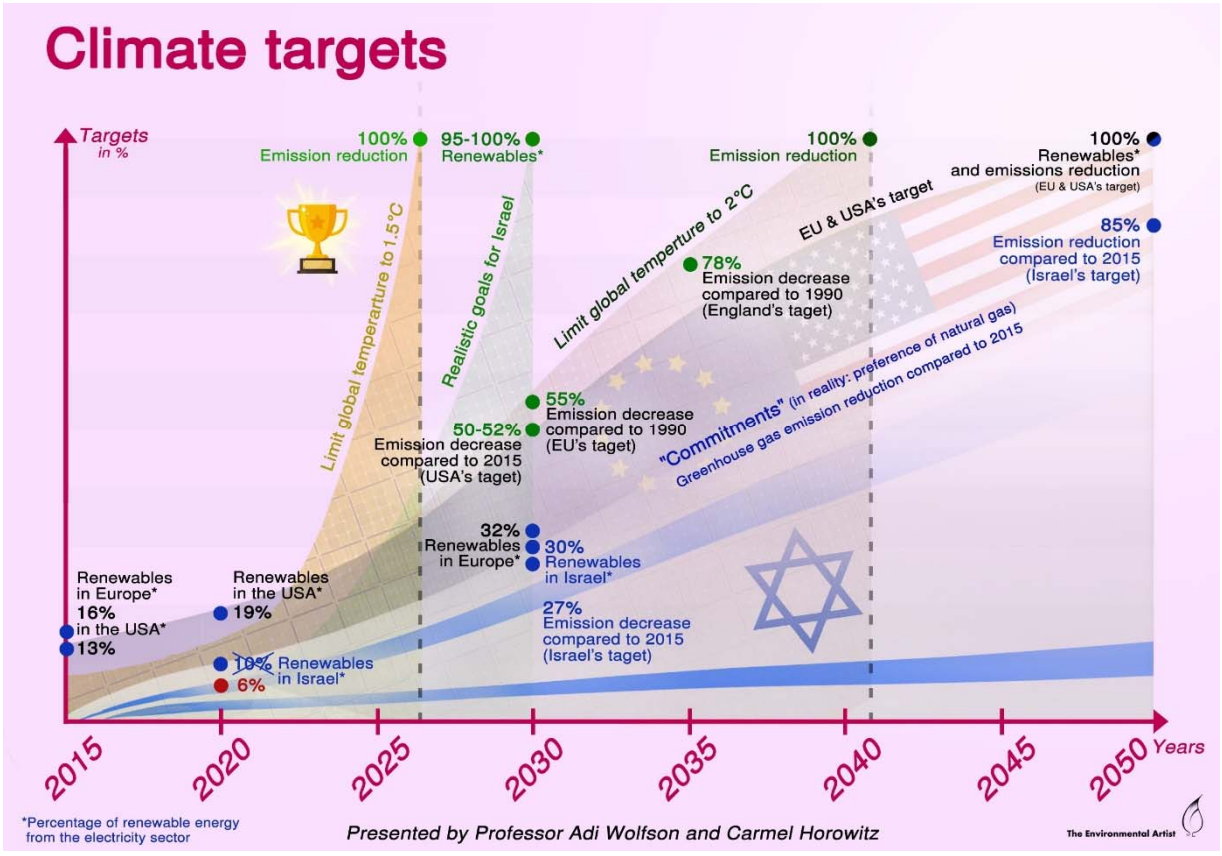
The following sections will describe the actions needed to fulfil Israel's modest GHG reduction goals.

A. The electricity sector

Goals set by the Government: Reduction of GHGs originating from the production of electricity before the year 2050 by at least 85%, as compared to what was measured in 2015, which was 37.4 million tons. To that end, Israel's Energy Ministry must evaluate the current energy mix being used to produce energy and then determine the renewable-energy goals for 2050, while insuring an attainable, reliable and self-sustaining national energy economy.[22] The production of electricity from fossil fuels (coal, petroleum and NG) is the primary cause of GHG emissions in Israel, starting from the process of extracting these fuels and through to their combustion.

The needed deeds: Over the last years, the Government of Israel has started a rapid transition from the use of coal and diesel oil to produce electricity to the use of NG, planned for completion by 2025. This transition to NG has many advantages, the greatest of which is the reduction in air pollution and the increased energy efficiency of the electric power plants. However, the very process of extracting this methane gas, an aggressive, toxic GHG, release pollutants into the sea and air. It has become clear that the uncontrolled emissions and leaks of the NG itself, throughout its entire supply route, during its separation and transport, contribute significantly to global warming.[6]

This being the case, the transition to renewable energy sources becomes a central goal in the reduction of GHG emissions, alongside the reduction of many air pollutants. In sunny Israel, the dominant renewable energy source is solar energy, the production of which requires space and complementary energy-storing batteries for the night hours and winter seasons. Moreover, due to Israel's relatively small size, dense population



and the value of its open spaces and biodiversity, it is preferable to produce solar energy atop buildings and to opt for dual use of agricultural land, water reservoirs and other areas of land.

In addition, it is obvious today that the energy-storage technologies are ready and that the production cost per kilowatt/hour of electricity from solar field arrays of photovoltaic cells is lower than that of a kilowatt/hour of electricity produced by NG.

Furthermore, one of the most effective ways to reduce energy consumption in general, and GHG emissions in particular, is by the wise use of energy. Decreasing energy consumption may be achieved by improving the energy efficiency in private and public buildings and in public and industrial areas. Energy efficiency contributes to lowering costs, to improving the quality of life and to the reduction of pollution of the air and of water sources. Ultimately, relevant regional cooperation with Jordan, Egypt and the Palestinian Authority, will enable a more efficient and sustainable production of solar energy, while strengthening international relations.[23]

B. The transportation sector

Goals set by the Government: Reduction of GHG emissions originating from transportation before the year 2050 by at least 96%, as compared to what was measured in 2015, which was 17.6 million tons; stopping the increase of GHG emissions from transportation by 2030, so that the emission rate stays at 3.3%, relative to what was measured in 2015; limitation of the GHG emissions permitted from new vehicles weighing up to 3.5 tons, registered as of Jan. 1, 2030, to an amount equal to no more than 5% of the average GHG emission for new cars weighing up to 3.5 tons, registered in the year 2020. As of 2026, all newly purchased urban buses must be clean vehicles.

The needed deeds: Mobility and traffic are key characteristics of modern society that provide many advantages, both social and economic. The transportation sector is another of the main sources of GHG emissions in the Israeli national economy, responsible for 40% of the national energy consumption, most of which is still based on polluting fuels.[24] As such, a reduction of private mileage must be attained by the promotion of public transportation, bicycle paths and pedestrian walkways, as well as the provision of mechanisms for joint and cooperative ridesharing, alongside the transition to electric transportation (trains, buses, trucks and private vehicles), and appropriate municipal planning for pedestrian and alternative mobility – all of which should lead to significant reduction in GHG emissions and the air pollution associated with this sector. Investment in public and alternative transportation should also increase accessibility and mobility within the national economy and equality in employment.

In 2016, the Government presented another national plan for alternative fuels, the purpose of which is to decrease the use of petroleum in Israeli transportation by 60% before 2025, with the support of 'green' technologies, especially the transition to electric transportation.[25] In 2019, a national-strategic plan was published "for sustainable movement in urban space" – 'movement', including public transportation, walking, bicycling and motorized biking, dealing primarily with the search for efficient solutions for 'the last kilometre' in large cities and in general. This programme set its goal – that 40% of all travel within metropolitan areas should be on means of public transportation.[26] In another report on the goals of the national energy economy for the year 2030, it was stated that, as of 2030, vehicles fuelled by gasoline or diesel oil will be banned from entering Israel –all those for private vehicles will be entirely banned; heavier vehicles, primarily (commercial) trucks weighing up to 5.3 tons and buses, while heavier vehicles, over 5.3 tons category, will be run on compressed NG (CNG).[27]

Ultimately, it is important to note that this discussion should be expanded beyond the scope of transportation alone and should consider all manner of movement; that is, mobility and accessibility in the broadest sense and their impact on social and environmental jus-

tice. It is necessary to make certain that the above plans are both budgeted and executed. The benefits of their actualizations surpass their costs tenfold (e.g., the decrease in national expenditures spent on fighting air pollution, traffic accidents, time wasted in traffic jams, etc.).[28]

C. Food and wastes

Goals set by the Government: A 71% reduction in the quantity of municipal waste landfilled by the year 2030, as compared to the amount in 2018, which was 4.5 million tons. A 47% reduction of GHG emissions originating from solid waste by 2030, at least when compared to the emissions measured in 2015, which were 5.5 million tons. And a 92% reduction of GHG emissions originating from municipal waste by 2050, at least when compared to the emissions measured in 2015, which were 5.5 million tons.

The needed deeds: The agricultural sector is responsible for approximately 20% of all Humanity's GHG emissions. The production of food is a process rich in resources and rife with energy consumption. Agricultural and farming activities not only release carbon dioxide (through various uses of energy), but also methane (originating from ruminant livestock – the major emitters of methane) and also nitrous oxide, emitted by fertilizers and from over-tilled soil (1.5% of the total GHG emissions recorded in 2016 in Israel). To date, Israel has not yet established specific goals for the reduction of agricultural/farming GHG emissions – neither for the crops, nor for the livestock. In fact, according to a national report, 35% of all the food produced in Israel is wasted and 6% of Israel's GHG emissions are due to food loss.[29] Nonetheless, Israel does not have a national plan in place to reduce consumption, in general, nor the waste of food, in particular. A CBS report states that the dumping and burial of wastes contributes 7% of all the GHG emissions in Israel.[30] A sustainable waste treatment policy is a crucial stage in the efforts to reduce Israel's GHG emissions causing climate change. Recently, the Ministry of Environmental Protection presented a strategic programme for the management of wastes in Israel.[31] Its main goal is to reduce the volume of waste in landfills from 80% to about 20% by 2030. This plan is based on the 'circular economy principle' and on the 'waste hierarchy', that focuses on reuse and recycling, rather than the disposal of waste products at landfills. As such, this programme presented goals focusing on the treatment of those waste components that produce the greatest amounts of GHG emissions, like organic wastes, biological decomposition and more. By treating organic waste in dedicated containers, where they undergo anaerobic digestion and/or by collecting the methane emitted from landfills and biomass digesters — what was once wasted can be recycled and reused as a renewable energy source.

D. The industrial sector

Goal set by the Government: To reduce the GHG emissions from the industrial sector by 56% before 2050, at least in comparison with the parallel emissions recorded in 2015, which were at 12 million tons.

The needed deeds: Most of the GHG emissions resulting from industrial processes are emissions from the production of energy or electricity by burning fossil fuels. In addition, during various industrial processes, such as cement or fertilizer production, chemicals are involved which may be released into the air, among them GHGs. The transition to the use of renewable energy and the installation of hermetically sealed infrastructures to supply NG to the heavy industrial plants may help to significantly reduce these GHG emissions.

Complementary tools for promoting national climate policy

Besides the aforementioned reduction goals and the various plans for the relevant sectors, in order to meet the planned goals for a low-carbon economy, it is necessary to combine these programmes with the use of certain complementary tools, such as the ratification of a "Climate Law," enforcement of the costs of carbon, the promotion of regional coopera-

tion in the areas of energy production, water resource management and the development of environmental and climatic technological innovations, alongside a national programme for the socioeconomic adaptation to all these significant changes.

A. "Climate Law"

A "Climate Law" should function as a framework for short-, medium- and long-term policy making and coping with the climate crisis, by providing a stable and permanent legal basis for the goals presented to all the governmental ministries, that obligates the Israel's Government to formulate a perennial, national programme for the reduction of GHG emissions and to make suitable preparations for the climate crisis, under ongoing independent supervision and oversight. Note that the execution of such a law requires cooperation and agreements between all the sectors in the Government's national economy, local authorities, the industrial and business sectors and, naturally, civil society. In recent publications, it was stated that there are five key components to successful climatic legislation: 1) the definition of clear goals; 2) the design of the steps and policies; 3) monitoring the progress; 4) defining institutional responsibility; and 5) encouragement of public participation. In addition, note that a portion of the climatic legislation must be specifically related to the issue of socioeconomic adaptation to all the required changes.[32]

B. Carbon tax

The accepted macroeconomic approach for assessing the benefits of the struggle against global warming equates the costs incurred by reducing the warming trend (in terms of decreased GDP and present welfare) with the costs involved in decreasing GDP and future welfare under increasing global warming. A research team at the Bank of Israel noted that the placement of a price-tag on carbon use was meant to remedy a significant market failure, caused when the polluter is not obliged to pay for emitting GHGs. Taxing carbon usage is thought to be the most efficient means for promoting reduction in GHG emissions and creating certainty in the economic markets. Various calculations indicate that, in this case, adopting an ambitious policy may reduce the emissions in Israel by 92% before 2050, as compared to the data from 2005.[13] However, complementary steps must be taken to provide easements to those groups that will carry the burden of this 'carbon tax'. In fact, note that when a 'carbon tax' is imposed, it is usually on the fossil fuels. As such, to gain maximal benefit from carbon taxation, especially when the taxes on fuels are already very high in Israel – <u>all</u> the sources of GHG emissions should be taxed, e.g. food production, waste landfills, airline flights and so forth.

C. A National Adaptation Plan

Due to the high sensitivity and vulnerability of Israel and its cities to climate changes, in 2017, a "National Strategy and Action Plan" was prepared for dealing with climate changes.[33] This plan includes recommendations to the Israel Government regarding national strategies and operations in the various economic sectors – aimed at preparing for and coping with climate change and extreme weather events that occur in our region or are foreseen. This plan delineates five operative goals, provides detailed action plans for attaining each of those goals and addresses them to the relevant governmental ministries and offices, e.g. health, education, security, construction etc. The primary goal of this plan is to reduce the amount of human harm and property damage, while building economic fortitude, by way of monitoring cases of morbidity and mortality and caring for high-risk groups; implementing the master plan for national water management; making appropriate preparations in the sectors of energy production and supply, construction and tourism; preparing for the prevent of forest fires and firefighting; protecting Israel's biodiversity, unique habitats and ecosystems; increasing our scientific knowledge, so that it may serve as a basis for decision making; informing and education the general public; and so on. Pursuant to the above goals, in 2018, an

Inter-ministerial Administration for Climate Change Adaptation was established, but so far, no funds were allocated for its actions.

D. Innovation and entrepreneurship

The State of Israel is frequently perceived as being a 'start-up nation' with its Israeli *hutzpah* (i.e. raw gumption), local entrepreneurship and ability to develop, promote and export technologies. Adjacent to the Israeli branch of high-tech, recent years have seen the sprouting of additional branches, such as cleantech, biotech, foodtech and agrotech.[34] Despite the large risks imposed by the climate crisis, it also presents many possibilities and opportunities for more development and commercialization of such technologies. National investment in the development of solutions and technologies for the reduction of GHG emissions and in ways of dealing with the climate crisis will place the State of Israel at the scientific and technological forefront of battle against this crisis. Recently, the Israel Innovation Authority, together with the Ministry of Environmental Protection, set up a special support programme, offering funding for pilot programmes that deal with environmental protection, climate change, renewal energy, smart transportation, marine environmental protection and more. Similarly, the Energy Ministry was granted 130 million NIS budget for 2021-2022, for the purpose of establishing a Joint Energy Institute, together with academic institutions.

E. International cooperation

In a globalized world under real crisis, there is special significance to cooperation between different countries. While the Kingdom of Jordan, one of Israel's adjacent neighbours, has large areas of available land that may be used for the installation of arrays of solar panels, it suffers from chronic water shortage. Meanwhile, Israel, that suffers from a dire shortage of available open land, has advanced desalination technology and access to the Mediterranean Sea. It is easy to see how these two neighbouring countries may fill each other's needs. In fact, Israel's Ministry of Energy is currently considering laying an submarine cable, that would run to Cyprus and on to Europe.[35] It might enable support of the isolated Israeli electrical grid and the importing of renewable energy from countries at other longitudes, where the sun shines at different hours than in Israel and who have developed wind energy and hydroelectricity. Several cooperative agreements were made in with other countries in the region, for example, the "2020 Abraham Accord" with the United Arab Emirates,[36] that may promote the mutual supply of renewable energy and environmental technologies, as well as joint innovation. Furthermore, the diplomatic relations between Israel and the UAE would certainly benefit by the strengthening of economic ties.

Summary

The greatest challenge to Humanity today is the climate crisis. However, though it poses a significant threat to Israel, to date, it is not yet located in the crosshairs of Israel's domestic and foreign policies. Nevertheless, over the past few months, in light of the changes in Israeli politics and with the new US Biden Government and the European Union's announcement of instigating a 'carbon border tax', and in view of Israel's commitment to the "Paris Climate Accord" – the Government of Israel has decided to promote a national, low-carbon, economic plan, including the goal to significantly reduce GHG emissions and the provision of earmarked budgets to that end for the relevant sectors (production of electricity, transportation etc.). With the advent of the "Climate Law," carbon taxation and the execution of the "National Strategy and Action Plan," all of these may provide new and unique opportunities for Israel in the arena of development and/or the transition of technologies and the development of skills relevant to sustainability.

It is time to act, quickly, robustly and resolutely, for the benefits of the people of Israel, the world and future generations.

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Constantin Blaschke, Dietrich John and Julia Wagner

The EU as a global leader on climate action between ambition and reality

The European Green Deal is the EU's recent ambitious flagship policy aimed at fundamentally transforming the EU towards a more sustainable future. It underlines the EU's claim and ability to exercise climate leadership on the global level. In addition to the internal impact on EU legislation, the external dimension of the Green Deal implies engagement in climate diplomacy, climate targets for the EU's external financing instrument NDICI, as well as a greater focus on climate issues in the EU's partnerships. While the European Green Deal is an ambitious policy initiative that holds the potential to boost global climate change efforts and endow the EU with a genuine leadership role on the world stage, it must also be acknowledged that there are limits to what the EU can realistically achieve. In this context, this article emphasises the need for the EU to, inter alia, join forces with like-minded partners, effectively implement climate spending targets, align climate goals with foreign and development policy objectives, but also ensure local ownership such as in Africa.

Keywords:
Climate action - EU global leader - climate leadership - European Green Deal - economic transformation - climate diplomacy - policy coherence - climate spending targets -NDICI - Africa

The EU as a global leader on climate action between ambition and reality

|| Constantin Blaschke, Dietrich John, and Julia Wagner

The European Green Deal – the core of EU climate action

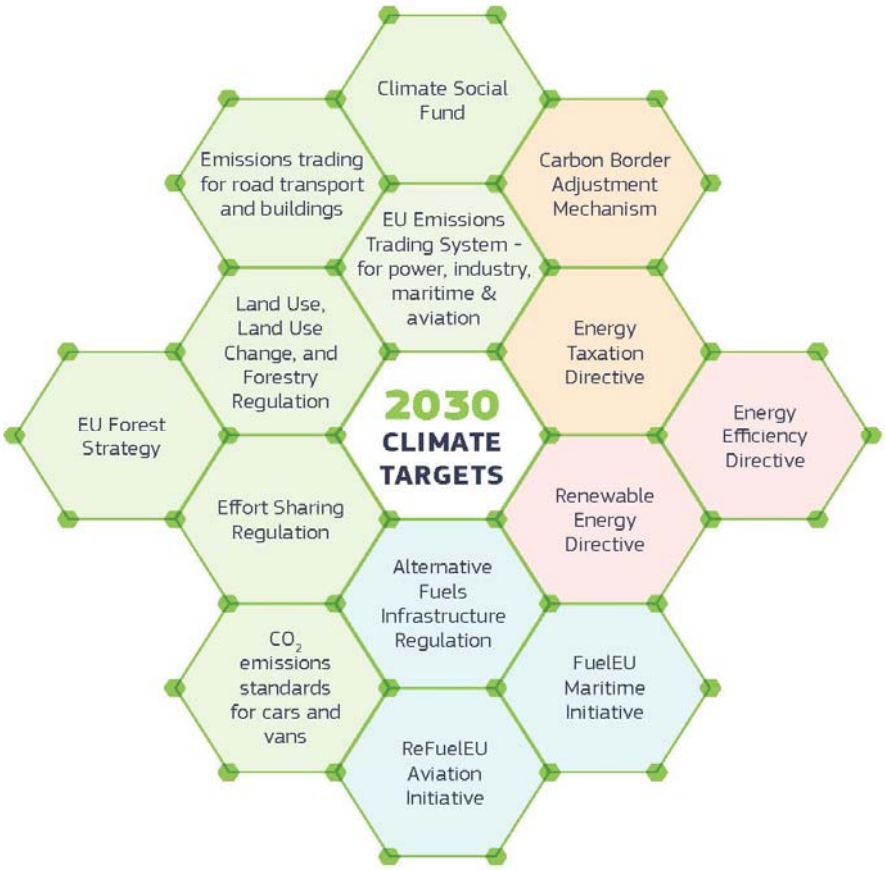
In December 2019, the European Commission unveiled the European Union's new flagship policy: The European Green Deal. This policy package, unique in regional integration projects, marks the onset of a new age in climate policy. Climate change mitigation and adaption measures thereby transcend policy fields to capture the economic sphere, ranging from transport and infrastructure to the energy sector as well as the international arena, whether reflected in trade or development policy. The Green Deal builds on the monumental challenge to achieve climate neutrality, both at home and abroad, and represents an opportunity for the EU to realize a €1 trillion investment scheme under the paradigm of green and sustainable growth. Climate neutrality, in other words, net zero greenhouse gas emissions, has become the key policy priority to be attained halfway through the 21st century. Environmental protection, climate action and economic considerations are, henceforth, inextricably intertwined. This approach signifies one of the most important elements in the EU's contemporary discourse, that is of both internal and external significance for the EU.

Internal significance – expectations and the quest to deliver

Without doubt, the European Union is a seasoned actor on climate policy. It holds a highly developed internal environmental regime, directed at long-term structural change, that is ever more aspiring since EU integration in the field gradually gained momentum in the 2000s.[1] The EU's mix of policy instruments incorporates market, regulatory and procedural components, focusing on climate mitigation.[2] For example, the EU regulates greenhouse gas emissions by setting an emission cap for all sectors and introducing the Emissions Trading System.[3] Brussels has also introduced regulatory policies such as emission standards for cars or energy efficiency rankings for household appliances and buildings. EU climate governance has thus charted a long-term trajectory of rising ambition and sustained action on climate change, principally towards decarbonisation.[4]

The European Green Deal reflects the spirit of climate policy efforts und concerns of our time. It includes a plethora of policy initiatives aimed at fundamentally transforming the EU's economy towards environmental sustainability. Not least in the context of the post-Covid-19 recovery, this offers promise and utility as a stimulator of renewed economic growth. Part and parcel thereof, the European Climate Law and the Just Transition Fund tighten EU targets and standards on the one hand, and provide financial support to the most vulnerable and least developed parts of the EU on the other.

Graphic 1: EU Green Deal policy proposals



Source: European Commission

The Green Deal, arguably the most important policy of a generation[5], reveals a fundamental political difficulty in devising the way forward: the right balance between political appetite for ambition and the feasibility of reforms must be found. Recent extreme weather across Europe and the U.N. climate panel's landmark report[6] underline the urgency for greater climate action. Nonetheless, legitimate concerns of social sustainability and inclusion require ample time and attention to detail**.** Apropos of the EU credo "no one is left behind", debates on the EU's 'Fit for 55' legislative package are a prominent example that highlight the fragility and challenges of ambitious climate policy.[7] To mitigate the impact on people's lives, particularly, those at the sharp end of polices, it is therefore imperative both to address the exacerbation of inequality and promote social inclusion in the EU.

External dimension – global climate leadership

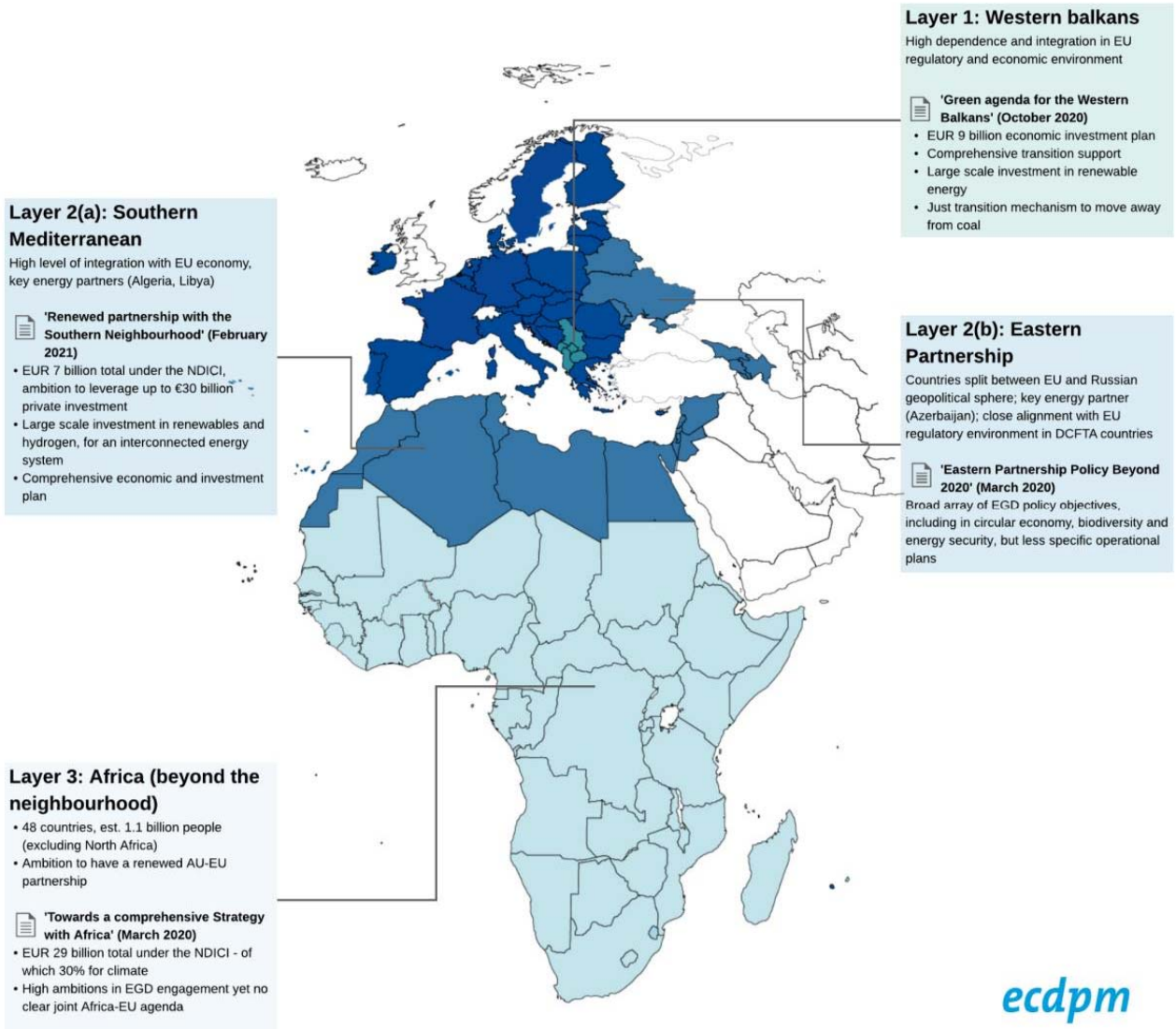
While climate action is of fundamental importance in the EU internally, it has traditionally been derived from and justified with international commitments and the global context. EU internal climate policy, in turn, gains significance through its external dimension. With the rise of climate change to the global agenda, the EU and its member states aspire to lead, with efforts yielding varying degrees of success. The EU emerged as a protagonist in the negotiation of the landmark multilateral climate treaties, as early as in the adoption of the 1992 UN Framework Convention on Climate Change and 1997 Kyoto Protocol, and as recent as the 2015 Paris Agreement.[8] The EU exerts global climate leadership by means of its exemplary policy framework and the strategic use of diplomacy. Internal policies and targets as well as resulting climate outcomes reinforce its

international credibility. Thereby, it has the potential to inspire the adoption of similar policies, and also provides a substantial material incentive to align legislation in view of EU market access.[9] The EU as a diplomatic actor is thus theorised to occupy a unique role in global climate politics, that of a leader and mediator, in short 'leadiator'.[10] As such, the EU pursues a strategic approach in consideration of the international context.[11] It puts an emphasis on building bridges to unite and form international coalitions.[12] In this regard, the EU persistently advocates for the boldest science-based international commitments among major economies.

Impact on EU external action and bilateral relations

The European Green Deal, unquestionably, has geopolitical implications.[13] Most fundamentally, the repercussions feature EU energy security, the global energy market, especially oil and gas exporters, and global trade in general. In particular, the expectation of stricter climate and environmental standards, including the carbon border adjustment mechanism, bear a coercive element on third states.[14] Hence, the European Green Deal requires fine-tuned external engagement conjoining foreign, trade and development policies. The EU reconfirms its multilateral, alli-

Graphic 2: Integrating the external dimension in EU regional strategies



Source: Teevan, Chloe / Medinilla, Alfonso / Sergejeff, Katja (2021): The Green Deal in EU foreign and development policy, ECDPM Briefing Note No. 131

ance-building approach, notably towards Africa and the European neighbourhood.[15] The EU depends on international partnerships that are instrumental in promoting sustainable trade relations and green transitions globally if it is to achieve its goals. By implication, climate change is a globally shared responsibility after all.

As far as international cooperation is concerned, the green policy framework is integrated into the regional strategies of the EU in terms of investment and development programming.[16] In context, the EU instrumentalises its budget and development policy to support the external dimension of the Green Deal, i.e. promoting climate action and the green transition globally. Thus, the new Neighbourhood, Development and International Cooperation Instrument (NDICI or "Global Europe"), the EU's €79.5 billion external instrument for the period 2021-2027, illustrates the pledge to consolidate climate action in the EU's external policies and hence, earmark 30% of the resources for supporting climate objectives, as evident during the current programming phase.

Limitations of EU climate engagement – Internal factors

Whereas the EU is vocal about its ambitions, Brussels is well aware that its room for manoeuvre and ability to achieve change has limits. This is due to internal and external factors.

Consumption patterns

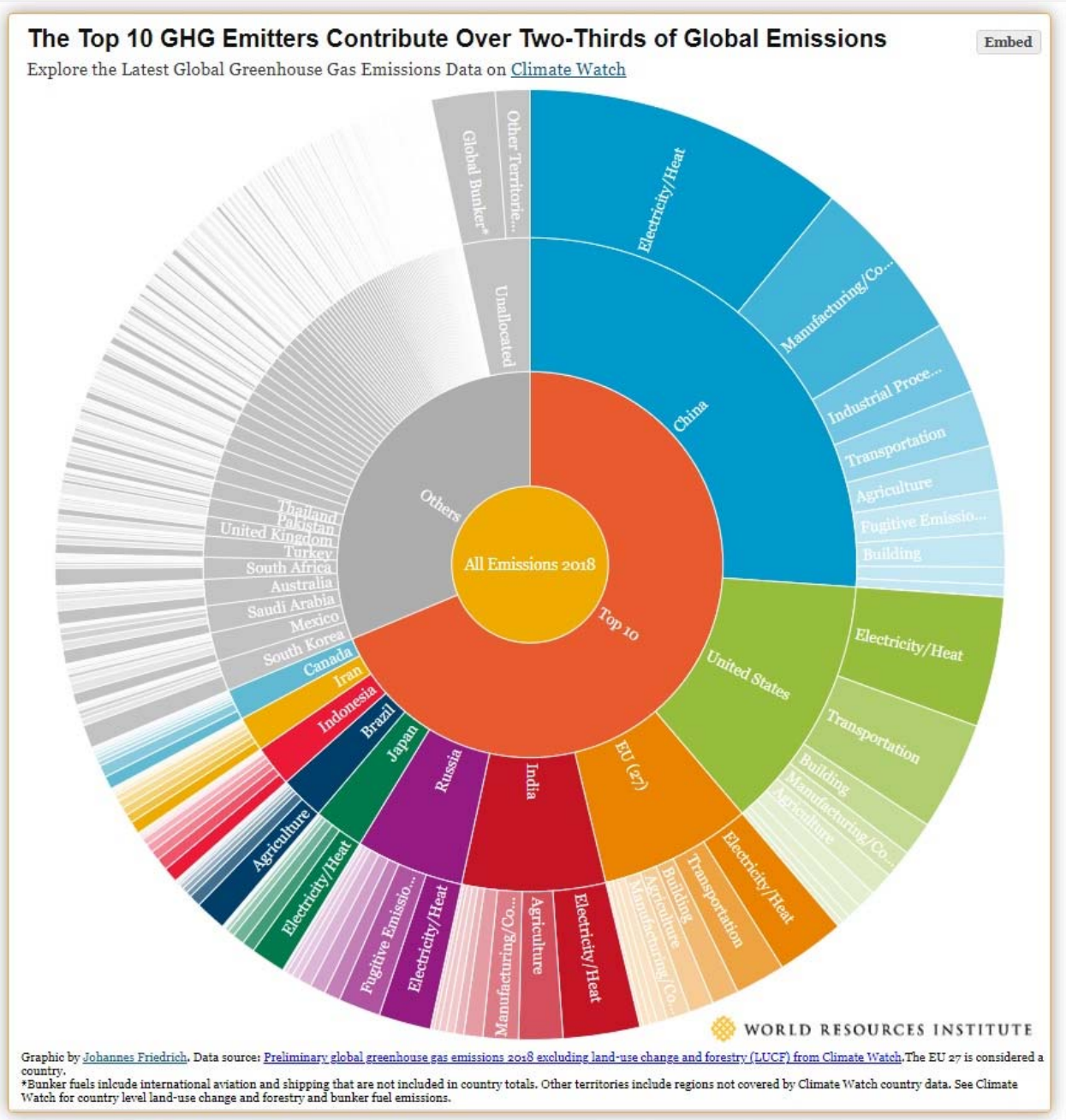
Internally, a major factor is the behaviour of European consumers. The EU would be badly advised if it wanted to regulate the smallest details of people's lives; yet a change in consumer behaviour is indispensable to combat climate change. The textile industry for instance requires high amounts of water and emits micro plastics and toxic substances into the oceans.[17] The production of a t-shirt consumes as much drinking water as one person would need for 2,5 years, while clothing and footwear production generate more greenhouse gases than international flights and maritime shipping together.[18] Under these circumstances, fast fashion is unsustainable. Another example concerns coffee to go. Studies show that even reusable cups are not necessarily better for the environment than disposable cups, so consumers should get used to bringing their own cup from home.[19] While these are just two examples among many, consumers need to be sensitised accordingly, politically difficult as it may be.

The EU's climate finance architecture

Besides consumer patterns, existing climate-related spending targets affecting the Green Deal's external dimension might be limited in their effectiveness. The aim of spending 30% of NDICI funds on fighting climate change falls short of expectations by NGOs of a 50% spending target.[20] Moreover, it is not clearly defined which projects count into this target – those focussing exclusively on the objective of fighting climate change or also those contributing only to a limited extent to this aim?[21] In any case, the target remains aspirational – it is no legally binding provision in the NDICI regulation.[22] Others criticise that the EU's financial institutions invest more in climate projects in middle-income countries (MICs) than in those most in need and most affected by the reverse effects of climate change, i.e. low-income (LICs) and least developed countries (LDCs). The latter face great challenges to receive funding due to their often unstable economic environments and underdeveloped financial markets. The EU's funding mechanisms, however, can shoulder the risks of investing in innovative proposals in LDCs, filling the funding gaps.[23]

Another point of criticism towards the NDICI climate target is the focus on mitigation instead of adaptation despite the already tangible negative consequences of climate change in many poorer countries.[24] Moreover, the EU's funding architecture with respect to climate projects is complex: Financing can come from within the NDICI's pillars, its investment tools European Fund for Sustainable Development plus (EFSD+) and External Action Guarantee (EAG), other European Financial Institutions

Graphic 3: Top Net Greenhouse Gas Emitters.



Source: World Resources Institute, https://www.wri.org/insights/interactive-chart-shows-changes-worlds-top-10-emitters

like the European Investment Bank and the European Bank for Reconstruction and Development, and from programmes under other headings of the EU budget, such as Horizon Europe, the EU's programme to support research and innovation.[25] Ensuring coordinated, coherent external climate action will therefore not be easy. In the worst case, outcomes risk falling short of existing potential, thus not only undermining the EU's efforts, but also its claims to global climate leadership.

Policy coherence in EU external action

More broadly, the need for policy coherence does not only concern the EU's climate financing mechanisms, but extends to the entire realm of EU external action. The EU's external objectives can, at times, be contrary to one another. For instance, there are fears that the planned carbon border adjustment mechanism could hurt Africa's development which is, in fact, one of the EU's foreign policy priorities.

Studies suggest that by 2030, not even 10% of energy in Africa will come from renewable sources. Thus, the continent is likely to continue depending on fossil fuels for the production of goods for a long time, making their import into Europe expensive.[26] Although the EU will likely have to grant exemptions to LDCs in order to comply with World Trade Organisation rules, countries other than LDCs might be hit hard.[27]

Limitations of EU climate engagement – external factors

Climate diplomacy

Externally, climate diplomacy is undoubtedly one of the most critical aspects of the EU's aim to reduce global warming. The EU has been actively engaged in diplomatic efforts with third countries long before announcing the Green Deal, and has strengthened its bilateral efforts after the failure of the Copenhagen summit in 2009.[28] With rising awareness of the threat climate change poses to the world, climate diplomacy has become increasingly significant.

It is evident that the EU's internal efforts alone are not sufficient to reduce the warming of the earth to the desired level of 1.5°C above pre-industrial times. Globally, the biggest emitter of greenhouse gases per capita are big oil and gas producers such as Brunei and the United Arab Emirates.[29] In net terms, the main emitter is by far China, followed by the US, the EU, India, Russia, Japan and Brazil.[30] The 2015 Paris Agreement, where all of these players committed to reduced emissions, is considered by many as a major success of EU climate diplomacy, with the EU fulfilling its 'leadiator' role.[31]

While relentless efforts by all major emitters are crucial to limit climate change, the EU's ability to influence other actors is naturally limited, and not all countries follow the EU's ambitious path. For example, the EU could not impede former US President Donald Trump to take the country out of the Paris Agreement. Brazil's President Jair Bolsonaro cut back significantly on environmental protection and encouraged deforestation of the Amazon despite calls from European leaders to stop.[32] Regarding China, Beijing's introduction of an Emissions Trading System similar to the EU model is considered as an EU success, and said to be based on both the EU's political engagement and practical, technical cooperation.[33] Nonetheless, China could not be convinced to step up its commitments at the recent meeting of the G20's energy and environment ministers in July 2021. Instead, with India, China blocked an ambitious agreement which should have served as preparation to the COP26 in Glasgow in November 2021.[34]

Thus, the EU's climate diplomacy has so far only achieved limited success and encountered intermittent setbacks. Much will depend on the political will of foreign governments, with current commitments known to be insufficient to limit the warming of the earth to 1.5°C. Realistically, however, the EU has only limited capabilities to incentivize third countries to pursue more ambitious climate goals.

Respecting local ownership

This plays into the broader context of "ownership". A key principle in development cooperation, the Paris Agenda on Aid Effectiveness from 2005 defines it as "*Partner countries exercise effective leadership over their development policies, and strategies and co-ordinate development actions.*"[35] Donors have to respect local leadership. With respect to climate policies, there is a tight line to walk for the EU – on the one hand pushing for bold climate action, on the other hand respecting national decisions and priorities. For instance, as mentioned above, the EU focusses in its external action on mitigation. However, as Africa emits currently only around 4% of global greenhouse gases, many African States consider mitigation to be a responsibility of developed countries and prefer to focus more on adaptation.[36]

The EU as global leader on climate action – the way forward

The EU considers itself, many would argue rightly so, as a global leader in the fight against climate change as well as in promoting and implementing climate action. The European Green Deal entails ambitious objectives in a wide range of policy domains to reduce greenhouse gas emissions across the EU and fundamentally transform and restructure the EU's economy and society, making it more sustainable and future-oriented. Besides its internal relevance within the EU, the Green Deal exerts significant influence in the realm of EU external action, from foreign to trade to development policy. This is reflected not only in EU engagement in multilateral and international fora, but also, for example, in its budget for external action, and priority-setting towards EU partners.

This unique approach to environmental issues distinguishes the EU on the global stage from other international actors. It also inspires the EU's claim to global climate leadership and serves as a basis for the EU to pressure other global players to step up their efforts. At the same time, however, it is important to acknowledge existing limits to what the EU can achieve. This can help to set realistic expectations – politically and environmentally – and facilitate the successful implementation of the EU's green agenda in practice.

This undoubtedly starts "at home". Continuously raising environmental awareness and successfully transforming the European economy from the perspective of both supply and demand will be essential to provide Brussels with the factual legitimacy for its external climate engagement. The post-pandemic recovery can be considered as an "ideal opportunity" to strategically invest in a sustainable future. However, in view of the reality that the EU cannot, should not, and will not stem global climate efforts by itself, the importance of ever-closer cooperation with like-minded partners around the world cannot be overstated. The re-emergence of the US under the Biden administration as a major global player in the field of climate change represents an excellent opportunity to join forces while creating constructive competition that serves a common and shared purpose. More broadly, the EU has already woven the "green" agenda into its numerous international partnerships, but must continue to do so. In the relationship with Africa for example, the EU must foster, inter alia, cooperation on energy transition and climate change adaptation in the agricultural sector, transform trade relations, key issues being fossil fuel exports and waste management, and help develop a circular economy.

Persuading other actors to pursue and, where needed, intensify their efforts in the fight against climate change will be crucial. Where this is financially underpinned with NDICI spending, the key is to effectively integrate existing climate targets in the programming of funds and implementation of projects. This includes ensuring that the countries most in need receive the bulk of support to modernise their economies in a climate-friendly way.

Furthermore, the success of "green" EU external action will depend on how well policy coherence can be safeguarded, i.e. whether EU climate objectives can be aligned with strategic foreign and development policy objectives. In this context, EU decision-makers must also be open to continuously debate and adjust existing policies in line with the evolving insights of the scientific community. Moreover, the EU must avoid negative repercussions, for example trade-related, arising from the external pursuit of its "green" agenda. Equally important, in this respect, will be to consider the priorities and needs of its partners, such as in Africa, and to cooperate closely with actors on the ground, including civil society, as part of the efforts to ensure local ownership.

Outlook

The role and performance of the EU as global leader on climate action will doubtlessly continue to attract a high degree of attention. For the time being, the EU's Green Deal can be considered a major step forward in global climate change efforts and represents a

significant and ambitious attempt to inspire other key actors to step up. It is the coming years, however, that will show to what extent the EU can live up to its ambitions and contribute to addressing what is arguably the most urgent challenge of our time.

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Christoph Rapp and Christian Springer

Lab-in-a-Bag

This paper presents an integral knowledge exchange project within the framework of an experience-based teaching concept on water, a topic that is gaining more and more urgency and relevance worldwide. In doing so, the importance of a sound university education in hydraulics, hydraulic engineering and urban water management is derived via the central role that water plays in global warming processes. The focus of this article is on the DAAD-funded exchange project “Lab-in-a-Bag“, on which partners from Tanzania and Germany have been working since April 2021.

Keywords:
Water - climate change - knowledge exchange - experience-based teaching - mobile teaching labs - hydraulics - hydraulic engineering - urban water management

Lab-in-a-Bag

|| Christoph Rapp and Christian Springer

1. Introduction

Since time immemorial, people have settled near water because it provides them with everything they need to live. Besides drinking water, the food supply from aquatic life was significant. Later, the irrigation of fields, process water for tanneries, for example, and the receiving water for wastewater were added as important factors. Thus, the first advanced civilisations emerged precisely where water was not abundant, but had to be managed intelligently: in the so-called Fertile Crescent. The dynasty of the pharaohs, for example, emerged from district rulers who managed the irrigation canals along the Nile. Further examples from Asia and South America will not be given here.

At the latest with industrialisation and the use of large quantities of (cooling) water for power plants and factories and the trades routes spreading over the waters – especially also for fossil fuels – the access to the world's rivers and oceans was a strategic advantage in the development of metropolises. As settlement pressure increased, rivers were controlled more and more, their flood plains straightened and trimmed. Protection against flooding and the extraction of groundwater moved to the forefront of "cultural hydraulic engineering".

With climate change and the associated rise in sea levels, concerns grew, especially for coastal agglomerations. But after the major flood disasters that occurred in Germany in 2021, the question is being asked more generally: "Is it still safe to live by the water?".[1]

The connection between climate change and river gauges has been evident for a long time.[2] In recent years, the focus has rather been on the ever decreasing precipitation, as the title "Germany's soils are thirsty" shows.[3] While the effects are now causing a media outcry even in the climatically moderate, industrialised Germany, the catastrophic consequences in the poorer, drier regions of the world go almost unnoticed. However, the developments were anticipated by the Intergovernmental Panel on Climate Change (IPCC) as early as 2007.[4] For the anthropogenic temperature increase of 1°C in 2020, the authors of the report predicted that an additional 400-800 million people worldwide would live in water-deficient areas. In 2050, with a temperature rise of 1°C to 2°C, there will be 1.5 billion people, with a temperature rise of 2.5°C, 2.4 to 3.5 billion people living without access to clean water.[5]

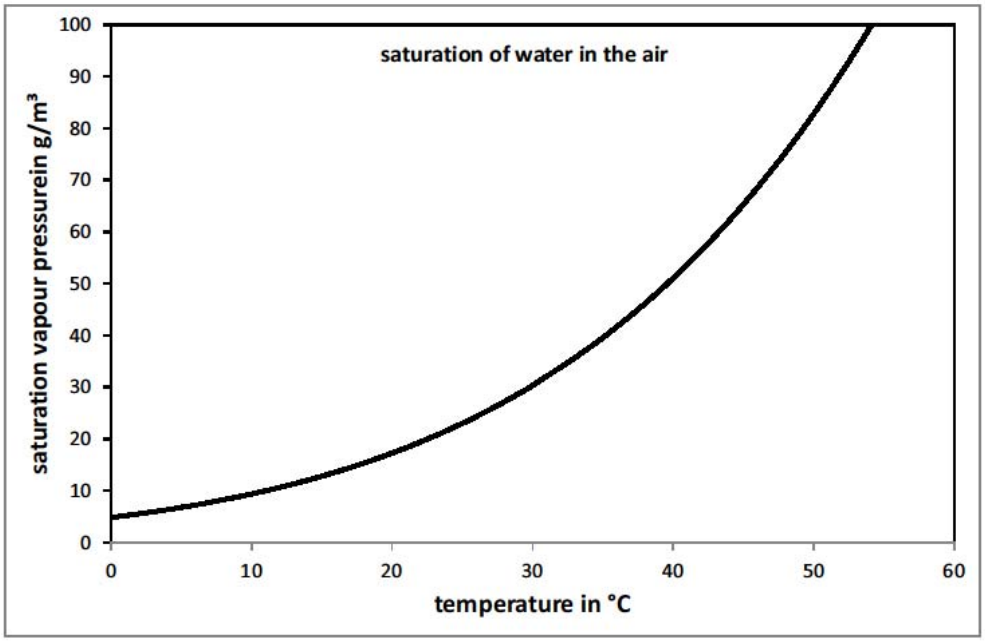
It should not be forgotten that water is the climate change element par excellence. Water in its three phases – gaseous (0.001%, i.e. water vapour), liquid (97% salt water and 0.7% fresh water) and solid (2.3% ice) – has a significant influence on the climate of our planet, not only because it covers 71 per cent of its surface.[6] The oceans absorb a large amount of CO_2 and have warmed by about 0.011°C since industrialisation – which saved the atmosphere a warming of 11°C – water vapour is the number one greenhouse gas (also with a rebound effect[7], see below)[8] and the ice albedo effect, i.e. the reduced reflection of sunlight due to melted glaciers, is a major rebound effect.

Rising temperatures will lead to less frequent, but much heavier precipitation due to the higher saturation vapour pressure (exponential function) (see Figure 1). This is because precipitation does not occur until the saturation vapour pressure is reached. The cold, Siberian air is dry; humid, warm air leads to tropical rainfall.

just as Antoine Lavoisier once discovered in 1783: Water consists of one part "vital air" and two parts "inflammable air".

Water thus plays a central role in climate change and adaptation. To meet the challenges, humanity will need the creativity of many well-trained engineers and scientists in this field. One approach to meeting this need is described in this paper.

Figure 1. Saturation of water in the air



Source: Created by the authors

Especially if the local effects are considered (e.g. a global warming of 2°C affects the Mediterranean region with a temperature increase of 4°C), one can imagine the consequences. Locally, the "distribution systems" must then also be questioned. One of these circulation systems, the AMOC (Atlantic Meridional Overturning Circulation), known to us as the Gulf Stream, is in danger of collapsing due to the melting Greenland glaciers, according to recent findings.[9]

Water also plays the central role in solving the climate crisis: after all, 17 percent of the world's electricity consumption is supplied by hydropower. And in future, H_2O is to be split into its atoms by electrolysis and the hydrogen extracted in this way is to be used as an energy carrier. Its combustion releases energy, water is created and the cycle is closed,

2. Knowledge Exchange

It is evident that knowledge is the basis of development. In a massively digitalised and networked world, it seems easy to exchange knowledge. With the permanent increase in knowledge, the degree of complexity in application also increases. This means that responsible tasks can often only be taken on by well-trained experts who have internalised the knowledge. Therefore, learners need to understand and fully grasp the subject matter.

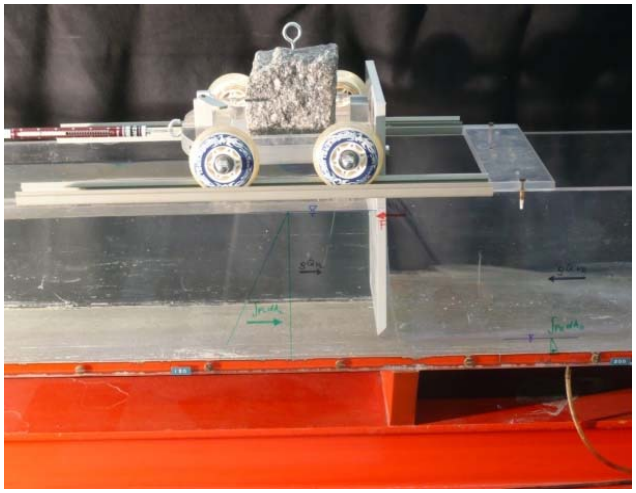
The basis for this is primary education, which, according to the United Nations Sustainable Development Goals, should be made possible for all citizens of the world.[10] However, it must not be forgotten that education at secondary schools and universities for an appropriate proportion of the population (for the

smartest, not for the richest) is elementary for the sustainable development of good living conditions. In all educational institutions, those imparting knowledge have to ensure that the facts are prepared, explained and placed in the right context. Enthusiastic knowledge transfer by passionate educators is essential for successful learning.

Currently, however, the education of these engineers, especially in developing countries, often does not meet these requirements. Complex physical and chemical contexts are usually only discussed or read out in books and taught in front-of-class at colleges and universities. At best, commercial physical experiments or software are used in teaching and black-box results are generated; which does not leave any space for creativity. Exams are mostly about reproducing, not projecting the actually understood content onto new questions, i.e. applying it. The engineers are thus often inadequately prepared for the requirements and questions of their future work. They are often unable to question given situations, which leads to the impediment of innovation and ultimately the development of societies.

A teaching concept was developed in the hydraulics department at the Technical University of Munich and has been used for years at teaching institutions abroad. It is based on the idea that learners follow the same path that the researcher of the phenomenon has followed.[11]

Figure 2: Force on a sluice gate.



Source: Rapp/Springer

Observe → Understand → Conclude → Challenge → Apply

This idea is illustrated by the following example of determining the flow force on a sluice gate, as it is used millions of times worldwide (see Figure 2).

Observe

A sluice gate is attached to a trolley which is placed on a Plexiglas channel; this trolley is held in the horizontal direction with a spring balance. When the flow in the laboratory flume is started and the amount of water is increased, the flow depth in the flume increases, causing a build-up by the sluice gate. It can be observed that the carriage initially moves in the direction of flow until it finally stops. The movement of the carriage has stretched the spring balance; a force can be read directly from it.

Comprehend

So there must be a balance between the flow forces and the holding force of the spring balance. The students can feel from this experiment that a dynamic force, the so-called impulse current, also prevails. The flow depth upstream of the sluice gate is large and small directly downstream; the flow depths can be marked on the Plexiglas wall. Since the flow as a product of flow cross-section and velocity is the same upstream and downstream due to mass conservation, it is obvious that the flow velocity downstream of the sluice gate must be much greater than upstream. So if you hold your hand in the channel up- and downstream of the sluice gate, you can feel that the impulse current, the product of flow, velocity and density, is much smaller upstream of the sluice gate than downstream.

Conclude

Obviously, there is an imbalance between the sum of hydrostatic pressure force and impulse current (together supporting force) upstream and downstream of the sluice gate, which is compensated by the force of the spring balance.

Challenge

The so-called momentum theorem, which theoretically describes the prevailing forces, can be easily derived for a fluid volume fixed in space. The result from the equation can then be compared with the measurement result of the spring balance. Slight deviations in the results from theory and practice can be explained by the friction force that is included in the horizontal reaction force – and not measured by the spring balance of course; however, this is quite noticeable on the test rig. The relationships must be further questioned on the basis of examples and experiments.

Apply

Applying knowledge to new tasks is an important part of the learning process. There are various interesting questions to be asked. This illustrative teaching method was implemented in the spirit of von Humboldt's principle – the connection between science and teaching – at various universities in Africa and Latin America through the "Verein zur Förderung des internationalen Wissensaustauschs e.V." (Association for the Promotion of International Knowledge Exchange). In Mozambique and Tanzania, teaching laboratories were set up and teaching materials were designed to support experience-based knowledge transfer (see Figure 3). In this context, a textbook was published in 2017 by Springer-Verlag titled: Hydraulics for Engineers and Scientists – a Course with Experiments and Open Source Codes[12], which has since been reprinted.[13] The book has been translated into English and will be made available worldwide, digitally and free of charge. The textbook is flanked by open source codes and simple and inexpensive experiments. These are now to be developed in cooperation with the University of Applied Sciences Erfurt and the Arusha Technical College in a way, that they can be packed into bags.

Figure 3: Experiments on pipe hydraulics (Karume Institute of Science and Technology, Zanzibar, 2013)

Source: Rapp/Springer

2. Lab in a Bag

As part of the project – which is funded by the DAAD (German Academic Exchange Service) –, staff and students from Erfurt University of Applied Sciences, Arusha Technical College, the associated Kikuletwa Renewable Energies Training and Research Center and the Verein zur Förderung des internationalen Wissensaustauschs e.V. (Association for the Promotion of International Knowledge Exchange) are developing mobile water teaching laboratories that can be used not only in developing countries. With the help of the experiments, complex relationships are to be presented in a simple way and brought closer to the students. The teaching concepts for the cases will also be developed jointly and included in the curricula of the participating universities.

2.1 Concept

The experiments cover hydraulics (fluid mechanics of water), hydraulic engineering and water quality or wastewater treatment. Accompanying instructions are created, vide-

os of the experiments are shot and made freely available via Massive Open Online Courses (MOOCs). Furthermore, open source codes for calculations of hydrodynamic issues round out the open approach of the project, which is expected to have a positive effect beyond the participating partners (Codes are available through github: https://github.com/christophrapp).

Following the project, the water teaching labs are to be produced by a start-up in a developing country and distributed worldwide; it is planned that the start-up uses the associated Kikuletwa Renewable Energy Training and Research Center as a hub.

Ultimately, the aim is to encourage students to think independently in a subject area that presents one of the major challenges of the future, not only in developing countries. With the open-source approach, other target groups can be reached as well, as in principle anyone interested can replicate and expand the Lab-in-a-Bag. Since, in addition to appropriate public documentation, MOOCs are intended to create access to the subject matter, this is not limited to universities, but environmental organisations, water supply and disposal companies, authorities, etc. can also benefit from the training materials and courses.

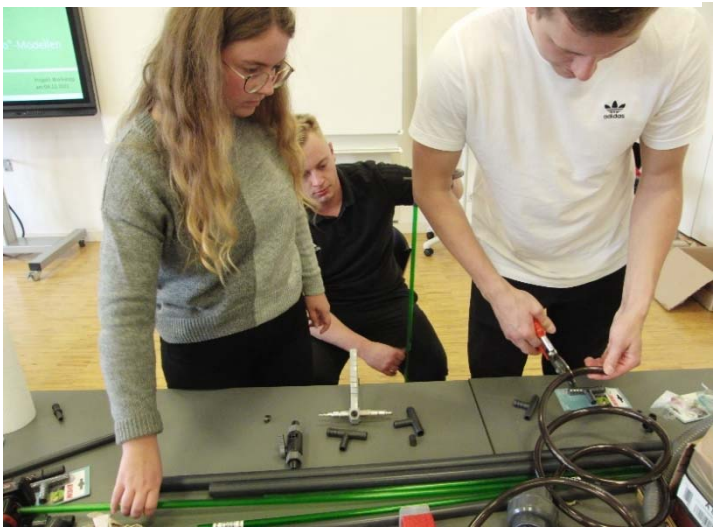
There are several conditions for the durability and practicability of these teaching materials: The materials to be used should be available on the market, also in developing countries, in an as standardised way as possible. This also means that the contents of the case must have an as low monetary value as possible so that parts can be easily replaced. Furthermore, the parts should be used as singularly as possible for the experiments in order to prevent misuse.

2.2 Implementation

The teaching materials are developed jointly by all project participants. In order to create sufficient space for discussions, scientific presentations, the preparation of scientific publications and the joint work on the teaching concepts, so-called retreats take place with five participating persons (teachers, doctoral students, students) from each university.

The retreats are arranged thematically along the project process; during the first retreat, which only allowed a virtual exchange between the partners due to COVID-19, the focus was on hydraulics or hydraulic engineering and modern teaching concepts (incl. digital applications) (see Figure 4).

Figure 4: Retreat in Erfurt - without the partners from Tanzania due to COVID-19.



Source: Rapp/Springer

At the second retreat, which will hopefully take place in Tanzania in spring 2022, parts of the Lab-in-a-Bag prototype will be tested by students and lecturers. Furthermore, documentation and accompanying documents will be discussed. The third retreat will then focus on urban water management and with it the second "Lab-in-a-Bag". An essential part of the cooperation between the project partners is the exchange of students and doctoral candidates. Stays of up to two months are intended to enable joint work, but also to create understanding as a prerequisite for genuine knowledge exchange in both directions. In detail, Tanzanian students and doctoral candidates will have access to the facilities of the University of Applied Sciences Erfurt and will be able to carry out internships with partners in industry and public enterprises. German students will have access to the facilities in Tanzania.

Figure 5: Wind water tower in Michamvi, Zanzibar

Source: Markus Heinsdorff

Ultimately, a large part of the development of the "Labs-in-aBag" and the associated teaching materials, concepts and videos is to be created or supported through student participation. To this end, it is also planned that the exchange participants will be involved in teaching at the respective partner universities. Since the start of the project, four students from Germany have already been recruited to write their theses within the framework of the project.

In addition to the assignment at the partner universities, visits to other universities are planned where the "Labs-in-a-Bag" will be presented with the associated teaching concepts.

3. Outlook

As part of a research project – and parallel to this project – Markus Heinsdorff (www.heinsdorff.de) plans to construct a simple laboratory building from regional, low-cost recyclable materials (e.g. cleaned waste) at the Kikuletwa Renewable Energies Research and Training Centre in order to test the simplest construction forms with locally available resources. The projects will be coordinated in order to leverage synergies among the professors and students involved and to be able to provide the "Lab-in-a-Bag" with a cost-effective space at each location. This cooperation is based on the joint experiences in a GIZ-funded PPP project in Zanzibar (see Figure 5).[14]

|| **Christoph Rapp**

Dr. Christoph Rapp was an assistant at the Department of Hydromechanics at the Technical University of Munich and, after receiving his doctorate, became head of the laboratory. In addition to experimental research into complex flows, he also devoted himself to descriptive teaching, for which he received several prizes, including the Ernst Otto Fischer Teaching Prize for an innovative teaching concept. He works for an energy supplier and is the managing director of a hydropower company. He also currently teaches at universities in developing countries through the Verein zur Förderung des internationalen Wissensaustauschs e.V. (Associa-

tion for the Promotion of International Knowledge Exchange), which he founded, and as a lecturer at the Bauhaus University Weimar.

|| Christian Springer

Prof. Dr. Christian Springer worked at the Bauhaus Institute for Future-Oriented Infrastructure Systems (b.is) at Bauhaus University Weimar and has been working on theoretical, experimental and practical issues in environmental and wastewater technology for many years. He has long-standing experience in the management of research projects as well as technology development. As head of the distance learning programme "Water and Environment" at Bauhaus University Weimar, Prof. Springer has also been able to gain experience with various forms of online teaching since 2015. He is currently successfully using 360° excursions and a quiz app in regular teaching at UAS Erfurt. His professorship of Urban Water Management and Environmental Engineering at the UAS Erfurt has a laboratory for water analysis and a workshop for the production and construction of test rigs.

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Magnus Bengtsson, Patrick Schröder and Michael Siegner

Building back better through circular economy - opportunities for ASEAN countries

The vision of a circular economy, requiring fewer natural resources and generating less waste, is attracting growing attention, from both governments and the private sector. This article introduces the circular economy concept and explains its role in wider sustainable development, in particular its relevance for low- and middle-income countries. It shows how circular economy approaches could help ease some of the tensions that exist between different sustainable development objectives, such as between different goals and targets of the Sustainable Development Goals (SDGs). The article then looks at Southeast Asia by reviewing how the member states of the Association of Southeast Asian Nations (ASEAN) have incorporated circular economy approaches into national policies and how the concept is gradually being mainstreamed into the ASEAN regional cooperation framework. Finally, it shows why circular economy practices should be part of the ASEAN region's recovery from the COVID-19 pandemic, helping to build economies that are both more inclusive and more resilient.

Keywords:
Climate change - ASEAN- circular economy - CEAP - Sustainable Consumption and Production (SCP) - Sustainable Development Goals - SDGs - COVID-19 Pandemic - Recovery - Building Back Better

Building back better through circular economy – Opportunities for ASEAN countries

|| Magnus Bengtsson, Patrick Schröder and Michael Siegner

1. The role of circular economy in sustainable development

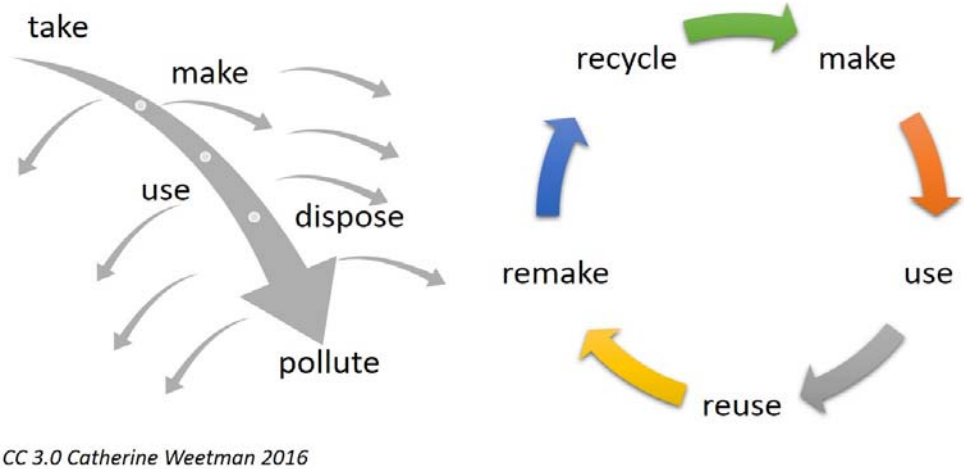
In recent years, the concept of the circular economy (see box below) has gained increasing attention in sustainable development discussions. For high-income countries, it offers opportunities to shrink their outsized consumption footprints while maintaining households' access to services and the wellbeing this enables. For low- and middle-income countries, it can be part of an alternative development model that reduces the tensions between lifting people out of poverty and protecting the planet, thereby increasing the scope for meeting the SDGs.

1.1 The contribution of circular economy practices to achieving the SDGs

Numerous studies have shown that circular economy practices, such as repair of electronic

Box 1: What is the circular economy?

The current prevailing economic model is based on a 'linear' logic and therefore highly wasteful – resources are extracted, processed and manufactured into products which are used and then thrown away – often after a short service-life. In contrast, the circular economy is an economic model that saves natural resources, minimises waste generation, and keeps materials and products 'in the loop' for as long as possible. A circular economy also maximises the use value of products by making them available to multiple users through product sharing and collaborative consumption. The circular economy is applicable to many sectors of the economy. It is commonly associated with the 3Rs – reduce, reuse, recycle, but also includes a wide range of other practices such as maintenance, repair, refurbishment, remanufacturing, and repurposing. The effective adoption of such circular practices often requires changes in product design so that products and their parts are made for staying in the loop for a long time. In some industries, shifting from physical products to immaterial services can also be part of the circular economy agenda.



Source: Wikimedia Commons

products, refurbishment of buildings, reduction of food waste, upcycling and recycling of plastic packaging, to name a few, can generate multiple sustainability benefits, including employment/livelihood opportunities and reduced environmental impacts. Such practices can also provide new business opportunities, making the concept interesting to the private sector. Circular economy practices can create synergies and reduce trade-offs between several SDGs and the associated targets.

Circular economy practices can be regarded as a "toolbox," which can contribute to the achievement of a large number of SDG targets. The strongest relationships exist between circular economy practices and the targets of SDG 6 (Clean Water and Sanitation), SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 12 (Sustainable Consumption and Production), and SDG 15 (Life on Land). If implemented in a socially inclusive manner, the circular economy will also contribute to poverty reduction, reducing inequalities and gender equality.[1] A shift to a circular economy can also play a significant role in climate change mitigation (SDG 13), thereby helping countries meet their commitments under the Paris Agreement.[2]

1.2 Strengths and weaknesses of circular economy as a development model

The circular economy has many environmental, economic and social benefits compared to the wasteful 'linear' economy that dominates today. However, the circular economy approach is not a silver bullet solution and not a replacement for sustainable development. Policy makers and other practitioners need to be aware of its strengths and weaknesses in order to see how it can be usefully applied. In addition, circular economy is not a fixed and well-defined concept; there are various interpretations and schools of thought on circular economy. There

The Hanns Seidel Foundation's Regional Project on Sustainable Consumption and Production (SCP) in ASEAN

HSF has been working on sustainable consumption and production patterns in ASEAN countries at both the national and the regional levels since 2014. The concept of circular economy naturally is a key approach in the implementation of this project. HSF's work follows a two-fold approach: facilitating an inter-regional dialogue platform between Asia and Europe on SCP mainly through the partnership with the Asia-Europe Foundation (ASEF) and the annual Asia-Europe Environment Forum while also providing technical support to selected ASEAN member states to develop their national policies on SCP. The project is implemented by HSF's Representative Office in Vietnam.

Source: HSS

are currently lively discussions on its significance as an approach to sustainable development and on how it can best be utilised. Table 1 summarises some key features of the circular economy approach.

1.3 Adapting other policy approaches to ASEAN countries

While China was one of the pioneers in developing circular economy policies, most of the existing policy experiences are from high-income countries. When ASEAN countries are now developing policy frameworks to steer their socioeconomic development in a more sustainable and resilient direction, other countries' experiences and lessons learnt can be useful. However, each country working towards a circular economy applies the concept slightly differently - tailored to its major needs and capacities and reflecting its economic structure, trade patterns, and other national features. Some of the main partners of ASEAN – the EU, China and Japan – have developed circular economy policies. The recent updates of the policies give an indication of the relevance for these countries' development pathways.

EU: In March 2020 the European Commission adopted the new Circular Economy Action Plan (CEAP)[3]. It is one of the main building blocks of the European Green Deal, the agenda for sustainable growth. The EU's transition to a circular economy is expected to reduce pressure on natural resources and create sustainable growth and jobs. The CEAP has announced initiatives along the entire life cycle of products, such as the Sustainable Product Initiative, which targets how products are designed, promotes circular economy processes, encourages sustainable consumption, and aims to ensure that waste is prevented and the resources used are kept in the EU economy for as long as possible. In addition, European

Table 1. Strengths, weaknesses, opportunities, and threats of a circular economy approach to sustainable development.

Strengths ● Circular principles can be applied across many sectors of the economy ● Enhanced material efficiency through creating loops - potential for "doing more with less" ● High technology innovation potential ● Linked to digital transformation of the economy	**Weaknesses** ● Limited focus on social equity issues, e.g. informal sector working conditions and fair access to resources ● So far, CE solutions have mainly resulted in relative decoupling from economic growth, but not absolute reductions in resource use, pollution, and waste ● Coordination challenges - Implementation often requires coordinated action by multiple actors at different stages of value chains ● Limited focus on sustainable consumption and sufficiency, e.g. 'living well with less'
Opportunities ● Many new initiatives on the international level that offer cooperation opportunities ● New business models and job creation opportunities ● Many low and middle income countries have vibrant repair sectors and reuse models, which can be upgraded and professionalised ● Opportunity for low and middle income countries to adopt a resource efficient alternative development model	**Threats** ● Valuable secondary materials are captured by dominant actors in value chains ● Low and middle income countries are used as dumping grounds for low-value waste

Member States have developed circular economy roadmaps; an example is the "Circular Economy Roadmap for Germany".[4] The roadmap includes a common target vision for a circular economy in 2030 and formulates concrete recommendations for action. It is a science-based framework for action that systemically describes the necessary steps for Germany's transition to a circular economy.

China: has been promoting the circular economy since 2008 through the Circular Economy Promotion Law. Under the new 14th Five Year Plan for the period from 2021-2025, China is prioritizing the development of the circular economy for the country. It includes planned goals to maximize resource use and the lifecycle of products with the expectation of increasing resource efficiency, spurring innovation, and meeting climate commitments. These will have direct consequences for businesses engaged in the manufacturing sector and create new market opportunities for green enterprises.

Japan: Since the early 2000s, the Japanese government has been advancing the 3Rs (Reduce, Reuse, Recycle) through a wide range of policies aimed at reducing the amount of final waste disposal and improving the recycling rates. Building on the 3R framework, in May 2020, Japan's Ministry of Economy, Trade and Industry (METI) published the 'Circular Economy Vision 2020' with three different viewpoints in mind: (1) shift to new business models with higher circularity, (2) acquiring appropriate evaluation from the market and society, and (3) early establishment of a resilient resource circulation system to present Japan's basic policy directions for a circular economy.[5]

Taking such international policy experiences into account, the London-based Think-Tank Chatham House has identified a set of policies that benefits circular business models and drives the uptake of circular practices by industry:

National circular economy roadmaps and strategies: Many governments around the world have included circular economy elements in their national development plans, as well as their policy frameworks for environment and climate, including Nationally Determined Contributions (NDCs), submitted in accordance with the Paris Agreement. These strategies include targets for the recycling and reuse of waste materials as well as plans for linking the circular economy and climate action, and plans to stimulate innovation and job creation through the shift to a circular economy. Circular economy roadmaps often include stakeholder processes to bring together important national players, including the finance sector.

Material resource efficiency and recycling targets for industrial activity: Resource efficiency covers a range of resources, including materials, water, energy, biodiversity and land. It refers to the sustainable use of these resources through reduced use, optimization and recycling to reduce material intensity – with the focus on producing the same level of output with fewer material inputs. Resource efficiency can be supported through adopting practices such as 'lean' manufacturing and product lifetime optimization, which in many industrial sectors are not being used at anywhere near their full potential.

Extended producer responsibility: EPR is a financial and/or operational instrument that aims to internalize environmental externalities related to end-of-life management. Under this policy approach, producers of goods are given a significant responsibility for the recovery, treatment or disposal of post-consumer products and waste. This approach shifts responsibility away from national, subnational or local authorities. The aim is to incentivize waste minimization at source, promote more environmentally conscious product design and support the management of waste by the public sector. EPR is considered a key cornerstone for the circular economy.

Table 2. ASEAN circular economy policy overview

Country	Circular economy strategy/ roadmaps	Waste management/ recycling	Product policies	Extended producer responsibility (EPR)	Fiscal policies	Description
Brunei					X	The government introduced a 3 percent tax on imports of plastic products in 2017.
Cambodia	X	X	X			National Strategic Plan on Green Growth 2013-30; policies towards waste management, recycling and pollution control; regulations on charges for plastic bags and types of materials allowed.
Indonesia	X	X				Multi-stakeholder Action Plan on plastic pollution; policies to provide infrastructure for integrated waste management, including hazardous materials.
Laos	X				X	The National Strategic Plan on Green Growth 2013-30, including payment for ecosystem services, environmental tax and fuel tax mechanisms.
Malaysia	X					Roadmap towards zero single use plastics 2018-30.
Myanmar		X				Target to achieve a zero waste, resource-efficient and sustainable society by 2030.
Philippines		X	X			Various policies to regulate the use of plastic bags and other packaging materials
Singapore	X			X		Zero Waste Masterplan; Resource Sustainability Act (RSA) from 2020 creates a framework whereby producers bear the cost of collecting and treating products.
Thailand			X		X	Roadmap on Plastic Waste Management 2018-30; tax breaks and incentives for investors for bio-circular-green economy.
Vietnam		X	X	X		Revised Law on Environmental Protection of 2020 identifying CE as a priority approach. New EPR law entering into effect in 2022: companies will be held responsible for collecting and recycling used plastic packaging; taxes on plastic bags for companies; fines for not classifying waste.

Source: Chatham House Policy Tracker circulareconomy.earth

Product policies (including eco-design, bans on single-use products and product lifetime extensions): Eco-design is an approach to products that considers environmental impacts during a product's whole life cycle. Eco-design can also facilitate easier repair and optimize remanufacturing processes. For new products, the design process needs to include principles such as designing for energy efficiency, reparability, recyclability, the minimization of packaging, and chemical safety. Product design policies – as they currently exist – need to change considerably in order to enable a circular economy.

Fiscal policies and taxation regimes are considered key policy tools that can help create markets for circular business models, address social and environmental externalities and generate public funds to finance the transitions. The transformation of taxation systems on both international and national levels is key to shifting to an inclusive circular economy. Tax regimes are a way for national governments to attract companies to establish circular operations in their country. Countries can reap an economic advantage by structuring their tax incentives according to their national resource priorities. The alignment of tax incentives makes sense for countries lacking within their territory certain critical resources crucial for their economic development or for solving environmental issues related to waste streams, as in the case of plastics. Specific measures include cutting taxes on labour and long-term investment returns, as well as increasing the tax burden on primary resource extraction and polluting energy generation.

1.4 Circular economy as a development strategy for low and middle-income countries

An increasing number of low- and middle-income countries across Asia, Latin America and Africa are beginning to apply circular economy approaches as part of their long-term development strategies. For example, the African Circular Economy Alliance (ACEA) brings together countries with the ambition to accelerate Africa's transition to a circular economy. Member countries currently include Nigeria, South Africa, Rwanda, Ghana and the Ivory Coast. Several others have indicated interest in joining including Niger, Senegal, Malawi and the Democratic Republic of Congo.

Similarly, in February 2021, the Latin-American and the Caribbean Circular Economy Coalition was officially launched as a new multi-stakeholder initiative to promote the circular economy. It has the aim of supporting the region to advance and invest in the circular economy transition as part of the COVID-19 recovery. Several countries including Colombia, Chile, Costa Rica and Uruguay have developed national strategies and roadmaps for the circular economy.[6] Initiatives like the LAC Circular Economy Collation bring to evidence the region's commitment to the implementation of the 2030 Agenda.

Many ASEAN countries are already actively developing circular economy policies. For example, in Indonesia the new national action plan from 2021 'Radically Reducing Plastic Pollution in Indonesia: A Multi-Stakeholder Action Plan', lays out an evidence-based roadmap to reduce the amount of plastic leakage into Indonesia's oceans by 70% by 2025, as well as achieving near-zero plastic pollution by 2040 through transitioning to a circular economy for plastics.[7] The country has also conducted a study on the positive impacts of circular economy practices in five major economic sectors.[8] On the basis of this study, the Planning Ministry is currently developing a national circular economy roadmap.

The circular economy is expected to be important for the future of manufacturing in ASEAN. The COVID-19 pandemic has seen an acceleration of digitisation and automation. The fourth wave of technological advancement in manufacturing, referred to as Industry 4.0, has been linked to the development of the circular economy.[9] In the ASEAN context, combining these two approaches can help to reduce material intensity of manufacturing, waste reduction from industry, and improve industrial innovation. In ASEAN countries, a large fraction of municipal solid waste is organic. There are also significant amounts of

HSF's work in Vietnam related to Circular Economy

The Hanns Seidel Foundation has been working on sustainable development in Vietnam for over a decade. Since 2020, this work has focused on two major policies adopted by the Government of Vietnam: The Law on Environmental Protection which was revised in 2020 (LEP) and the 2020 National Action Plan (NAP) on Sustainable Consumption and Production. As both define various targets and priorities, HSF's activities facilitate international expertise into the implementation process. This includes for instance, the development of a roadmap on Circular Economy which was identified as a priority in the LEP together with the Institute of Strategy, Policy on Natural Resources and Environment (ISPONRE) and the Ministry of Natural Resources and Environment (MoNRE). HSF also cooperates with the Ministry of Industry and Trade (MoIT) to develop guidelines for Vietnam's provinces to develop their own tailor-made Provincial Action Plans on Sustainable Consumption and Production.

Source: HSS

agricultural residues and growing amounts of by-products from food processing. These material streams have great potential for circularity and can, when properly managed, contribute to improved agricultural productivity and reduced dependence on costly synthetic fertilizers, among other benefits. To unlock this potential, governments should revise existing policies that inhibit circular business models for organic waste unnecessarily (such as free landfill disposal or unmotivated restrictions on treatment of human waste). Circular models for organic waste promote wider provision of sanitation to poor communities and can also reduce carbon emissions

2. Current status of circular economy policies in ASEAN and its member states

2.1 Overview of circular economy policies in ASEAN member states

Policies for the circular economy are not new to ASEAN countries, which have already adopted a range of policies of various kinds, including Extended Producer Responsibility policies, recycling mandates, sustainable product policies for several years. However, in most cases, these policies have not been part of any broader policy frameworks or roadmaps. In several countries, the recent strong attention to plastics issues has led to the development of national strategies or similar comprehensive plans. These strategies are often explicitly based on a circular economy approach and have helped spread awareness around the concept. Table 2 provides a snapshot of the current situation of circular economy based on the set of policies presented above.

2.2 Status of mainstreaming circular economy into ASEAN regional cooperation frameworks

Circular economy is not well reflected in the three ASEAN Blueprints – the key documents guiding the region's cooperation until 2025. When these plans were drafted in the mid-2010s, the circular economy concept had not

yet entered the mainstream of policy making. However, as noted above, the circular economy has recently gained more attention and is now explicitly referred to in several ASEAN high-level documents, including the ASEAN Comprehensive Recovery Framework[10] (ACRF, adopted at the ASEAN Summit in November 2020), and the ASEAN Regional Action Plan for Combating Marine Debris[11] (adopted in May 2021). The recognition of circular economy in the ACRF is especially noteworthy given that this is a cross-cutting plan adopted at the highest political level. For example, the ACRF highlights the need for human resource development and skills upgrading, including with a focus on SMEs. Such capacity building programmes offer great opportunities to include the topic of circular economy, to build understanding of the need for a shift to circular economy and the benefits this can have, and to provide participants with related skills. Similarly, the Framework includes activities to prepare the region for Industry 4.0 and to accelerate the adoption of digital technologies. Circular economy practices can often be facilitated by the use of such technologies so this provides an opportunity to include circular economy as one key area of application.

Two new ASEAN Frameworks relevant to circular economy are under development at the time of writing (August 2021). The ASEAN Economic Community is developing a Circular Economy Framework, which is expected to be a general framework with guiding principles and strategic priorities without providing details on specific initiatives. Meanwhile, an ASEAN Framework on Sustainable Consumption and Production (SCP) is under development as part of the ASEAN Socio-Cultural Community, which is the part of ASEAN that deals with environmental protection. This process is supported by UNEP and the EU, and the document is expected to include circular economy practices within the broader concept of SCP. ASEAN is now in the second half of the implementation of its three Blueprints and discussions on the post-2025 framework have already started. The Mid-Term Review of the ASEAN Economic Community Blueprint 2025, conducted in early 2021, generated a number of recommendations that would provide opportunities to promote circular economy practices through regional initiatives. This includes, for example, strengthened science and technology cooperation, deepened economic integration through harmonised rules and standards (which could be designed to favour circular and resource saving practices), and strengthened capacity to handle cross-cutting issues (which would make it easier to advance a circular economy as a multi-dimensional policy concept).

3. Building Back Better - Key opportunities to incorporate circular economy in COVID-19 recovery strategies

According to the Asian Development Bank (ADB), the COVID-19 pandemic led to an economic contraction in developing Asia in 2020 for the first time in 6 decades, including $163 billion to $253 billion in projected losses in gross domestic product across Southeast Asia.[12]

Governments around the world, including ASEAN, have pledged to “build back better,” using the recovery from the pandemic as an opportunity to accelerate sustainable development. However, in reality, most governments seem to be prioritising quick economic bounce-back over a sustainable recovery. Only $341bn or 18.0% of governments’ recovery spending is considered to be “green”, mostly accounted for by a small group of high-income countries.[13] Recovery spending has so far missed the opportunity for greening investment and the economy. It is therefore critical to direct funding towards green and circular solutions and create bankable green projects for the recovery.

Many studies have highlighted that the flawed linear model is no longer fit for ASEAN development. In contrast, the circular economy offers several opportunities to build back better from the pandemic for the long-term. The following are some of the main reasons why ASEAN Member State governments should make the promotion of circular economy practices a key pillar of their recovery efforts.

Circular economy practices can provide **more jobs and more resilient livelihood opportunities**, less vulnerable to shocks such as the COVID-19 pandemic. In Indonesia, it has been estimated that over 4 million new jobs could be created by 2030 through the adoption of circular economy practices in five major sectors.[14] In Bali, where the virus crisis caused a sharp decline in tourism, seaweed farming has expanded significantly.[15] This growth is part of an international boom in sustainably sourced ocean-based food products. Compared to other major industries in Bali, such as fishing and tourism, seaweed farming is much more resilient to supply-chain disruptions and economic crises.

People with livelihoods in the informal sector have been severely impacted by the COVID-19 crisis. According to ILO, around 80% of those engaged in the informal sector in lower-middle income countries were hurt economically by the lockdowns and declines in economic activities related to the pandemic.[16] Many of these informal workers are engaged in waste collection and materials recovery - activities that have been significantly disrupted by the pandemic. Providing better support for these groups and involving them in emerging formalised recycling systems could both have social benefits and make recycling systems more stable.

Circular economy practices can help **retain value that would otherwise be lost** when materials are discarded as waste. For example, the value of plastic packaging that is discarded each year in Malaysia, the Philippines, and Thailand has been estimated to US$6 billion.[17] Another example is agricultural residues where there is a great potential for conversion into raw materials, such as fibres for textile production.[18]

Circular economy practices can **reduce the generation of waste and thereby reduce costs for local governments** with strained budgets.

Facilitating sustainable recovery by supporting innovative Start-ups

HSF's Regional Project on Sustainable Consumption and Production provides support to innovative Start-ups with green and sustainable business ideas in various ASEAN member states. In collaboration with the Korean-based ASEM Eco-Innovation Center (ASEIC), HSF facilitates Green Start-up competitions that include extensive trainings on sustainable production techniques, circular economy approaches and management skills. By including the relevant governmental stakeholders in the activities, the programme also facilitates dialogue on regulatory challenges between young eco-entrepreneurs and policy maker

Source: HSS

Costs of waste collection, transport, and disposal take up a large share of local budgets across the ASEAN region. A recent study in Indonesia suggested that circular economy could help reduce waste generation in some major sectors such as food and packaging by more than one third.[19]

Circular economy practices can **make companies in ASEAN better prepared** to be part of international production networks. Global brands are increasingly trying to shift to circular practices, not only in their own operations but also across their supply chains. This means that parts manufacturers and other suppliers that do not apply circular economy principles are becoming less competitive. In this context, it is important to note that **international cooperation beyond ASEAN** will be an important element for success. Other regions like the EU and its member states actively seek cooperation with ASEAN to accelerate the transition to a circular economy.

Circular economy practices can help **make countries and sub-national regions more self-sufficient and thereby less vulnerable** to geopolitical risks and price fluctuations in international markets. With an emphasis on meeting local needs with locally available resources and on keeping products and materials in use, circular economy can reduce the reliance on long-distance trade and the associated risks. One example is food production in peri-urban areas where the use of wastewater and biofertilizers from human waste could improve yields and contribute to improved food security.[20]

Dato Lim Jock Hoi, Secretary General of ASEAN, said to build back better countries should continue to work together and strengthen cooperation. He stressed the need to embrace technologies and digitalization, innovation, sustainability initiatives, and inclusivity in plotting the region's recovery.[21] The circular economy can potentially deliver on all of these requirements, if designed and implemented in an inclusive and ambitious way. For example, the Indonesian Government aims to facilitate the shift to an innovation-based economy by granting up to 300 percent tax reduction on research and technology expenditures to encourage industry to develop more innovative products. A circular economy approach to product innovation can ensure that products are sustainable, repairable, high-quality and non-toxic. Similarly, the Thai government had announced that the Bio-Circular-Green (BCG) economy model will be part of its effort to promote a green recovery after COVID-19.

As this article shows, in a world facing multiple ecological constraints, the resource-hungry and wasteful linear economy model is no longer viable. In contrast, the circular economy approach holds considerable potential to help countries' transition to sustainable development. For a number of years, the economically dynamic ASEAN member states have adopted various circular economy policies, often to address waste issues. More recently, several ASEAN countries are developing comprehensive strategies, making circular economy principles part of their socioeconomic development visions. However, as governments in the region try to lessen the impact of the COVID-19 crisis and plan for a recovery from the pandemic, there is a risk that funding will flow to conventional linear solutions rather than supporting the transformation to a circular economy. This would be a lost opportunity. The region's development partners have an important role to assist countries and various stakeholders in finding practical ways to implement circular economy practices, overcoming challenges to building back better.

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Education for Sustainable Development in China: A Review of Progress to Date and Future Prospects

In the period since the announcement of the Global Action Programme on Education for Sustainable Development (GAP) (2015-2019) at the Second World Conference on Education for Sustainable Development held in Aichi-Nagoya in 2014 considerable achievements have been made in education for sustainable development (ESD) in China. As theoretical research and innovatory praxis go deeper, we are sure to see ecological civilization and ESD become a distinctive mainstream strand in the overall onward advance of the modernisation of education nationwide and serve as important arenas for innovation.

Keywords:
Climate change - China - Education for sustainable development - Education for ecological civilisation - Peak carbon emissions and carbon neutrality

Education for Sustainable Development in China: A Review of Progress to Date and Future Prospects

|| Shi Gendong

Since the announcement of the Global Action Programme on Education for Sustainable Development (GAP) (2015-2019) at the Second World Conference on Education for Sustainable Development held in Aichi-Nagoya in 2014, China has engaged in a wide-ranging programme of theoretical research and practical innovation in education for sustainable development (ESD). Taking as catalyst the implementation of the range of policy papers promulgated at the Third World Conference for ESD held in Berlin in May 2021, the experts' group from the Chinese National Working Committee on Education for Sustainable Development (CNWCESD) has engaged in multiple exchanges and discussions with various higher educational institutions and primary and middle school principals from across the nation to review and summarise work advancing ESD in China over the past five years, and to look forward to identify the likely trends in development and key tasks ahead for ESD over the coming decade. This paper presents a summary of the outcomes of those engagements.

1. Summary review of ESD in China

Looking back, the achievements in advancing ESD in China over the past five years can be categorised under the following five aspects of work:

1. Study and dissemination of literature concerning ecological civilisation and ESD published by the UN, UNESCO and the Chinese government.
2. Carrying out theoretical research into ecological civilisation and ESD and publishing a series of papers based on the outcomes of that research.
3. Offering advice to government and advancing the inclusion of ecological civilisation and ESD in national public education policy.
4. Conducting research for innovation in curriculums, pedagogy and study to promote more meaningful content in schools and fostering a new batch of model schools and districts demonstrating ESD as catalyst for higher-quality education.
5. Running a range of activities helping foster the practice of sustainable living among young people and encouraging their participation in the building of a society founded on ecological civilisation.
6. Further improving systems and effective methodologies for sustainability training for principals and educators at both national and local levels
7. Creation and extension of a cooperative alliance for ecological civilisation and ESD in partnership with other stakeholders such as

certain social organisations, museums and enterprises.
8. Consolidating a platform for the collection, archiving and exchange of ESD-relevant information plus related services, including print magazine, website and WeChat public account formats.
9. Assembling an accomplished team well able to conduct research, organise work and offer guidance for ESD.
10. Setting up a robust international network of ESD specialists and platforms for exchanges.

In summary, the value of the successful experience and innovation embodied over the course of implementing ESD programmes in China over the past five years and longer includes:

- guaranteeing that research programmes for ESD are characterised by correctness in direction, being forward-looking and in the value of the guidance they offer, because there has been an emphasis on aligning the top-level design of theoretical and practical research to the demands of trends in social, economic, environmental and cultural sustainable development at the global level and the requirements of the domestic building of an ecological civilization;
- attaining high levels in research into educational theory and practise in the domestic arena, to good effect, because of the emphasis placed on a primary goal of creating a theoretical framework based on fostering youth achievements in sustainable development and rooted in the requirements for reform and innovation in the way schools are constituted. This has a produced a series of research outcomes among which the road map for ESD, sustainable development trainings for young people, E-STEAM [ESD in science, technology, engineering, art and humanities, and mathematics] courses, sustainable learning classrooms, schools for sustainable development and ESD experimental regions can be seen as representative examples.
- achieving excellent results over a broad area in ESD in the ongoing promotion of high-quality education in participating schools because we made sure to avoid the shortcomings of "teaching to the test" style pedagogy, adapted to the needs of social and personal sustainable development and paid attention to solutions suggested by principals and educators regarding a model of skills training guided by ESD principles.
- the team achieving a transition from ESD as an abstract concept to a broadly applied practice in schools at a speed much faster than the international average, thanks to our painstaking design and full participation in evidentiary research into holistic (WIA) systems of ESD praxis that includes establishing new educational concepts, innovations in curriculum content, the creation of ESD learning centres, practising sustainable ways of living and taking part in building a green society.
- bringing together a wide range of stakeholders and various social forces to work towards fostering a new generation of citizens educated in sustainable development and playing an active part in exploring the theory and practice of life-long learning, thanks our concentrated efforts in establishing a collaborative ESD network that schools, government agencies, social partners and enterprises can jointly participate in.
- enriching our own knowledge and praxis by studying research outcomes and learning from the successful experience of the UN and other nations, thanks to the attention we gave to correlating and conducting linked research into how international trends in education relate to the progress of reform and innovation in Chinese education, and also sharing Chinese insights into ESD with the world, in the shape of distinctive research outcomes and outstanding case studies, an embodiment of our team's spirit of international partnership.

2. Prospects for ESD over the next ten years

After thorough study of the core message of documents such as UNESCO's *Roadmap for ESD for 2030* published subsequent to the May 2021 Third Global Conference on ESD held in Berlin, and particularly in light of our summation of the achievement of work to advance ESD in China over the past five years, the following is how we see the prospects for the building an ecological civilisation and ESD in China and what we regard as the major tasks:

Emphasise theoretical research for ecological civilisation and ESD.

The concept of ecological civilization represents the sum of the material and cultural progress mankind can achieve in the process of achieving the goal of harmonious development for man, Nature and society. Sustainable development is core to a society based on ecological civilisation. At present, most countries are at the stage of making the transition from industrial societies to ecological civilisation. As a country's sustainable development advances, it will of necessity spur the continuing increase in ecological civilisation elements which will then in turn speed up the transition away from industrial to ecological civilisation. As we face a post-pandemic world full of instability and uncertainty, it is essential we help every learner understand that sustainable development and ecological civilisation theory represent an arsenal of the thinking required to tackle the many severe challenges we face such as global warming, pandemics and economic downturns. It is of vital importance not just for humanity as a whole or the various nations, but also for each individual citizen.[1]

In this regard, the major research themes we will be engaging with include: the theoretical underpinnings of ecological civilisation and sustainable devolvement; the interrelatedness and particularities of education for ecological civilisation and ESD; outline programmes for making ecological civilisation and ESD part of elementary education and the same for adult education and vocational training; the make-up and methods of a programme to foster green living among young people; innovatory models in curriculum design and pedagogy when teaching ecological civilisation and ESD; and a strategy for creating green campuses with the distinctive features of ecological civilisation.

Bringing the concepts of peak carbon emissions, carbon neutrality and low carbon living into the national education system.

The Chinese government's major strategic policy position on peak carbon emissions and carbon neutrality represent an effort to resolve the most prominent limiting problems in the resource environment and a necessary choice if the Chinese people are to achieve long term development, and are also a solemn undertaking to be part of building a shared future for humanity.

The specific goals of this strategy include achieving the initial structural foundations of a low carbon economy by 2025, a drop in domestic energy use of 13.5 percent compared with 2020, a decrease in CO2 emissions of 18 percent compared with 2020, the proportion of energy from non-fossil fuel sources reaching around 20 percent and forest cover growing to 24.1 percent. It is hoped that by 2030 clear advances will be apparent in the transition to a green society and economy, with efficiencies in the most energy-use intensive industries achieving the best international standards, and the targets are a 65 percent reduction in CO2 emission against the 2005 figure, 25 percent energy from non-fossil fuels and forest cover up to around 25 percent. CO2 emissions should by then have peaked and begun a stable decline. By 2060 it is hoped to have a fully low carbon economy and clean, safe and efficient energy generation, with non-fossil fuels providing above 80 percent of supply, the goal of carbon neutrality realised, major achievements in building an ecological civilisation and the beginning of a new world where man and Nature are in harmony. [2]

To achieve these twin carbon targets, besides fully integrating the goals of peak car-

bon emissions and carbon neutrality into long-term plans for economic development and optimising the structural arrangements of high-quality development regions such as Beijing-Tianjin-Hebei and Guangdong-Hong Kong-Macau in line with these carbon goals, another major basic policy decision by the Chinese government has been to introduce the concepts of peak carbon emissions, carbon neutrality and low carbon living into the national education system, with a view to speeding up the adoption of green lifestyles and creating a public consensus that will make full public participation come more quickly.

To assist in this respect, our team will draft an *Outline for Integration of Peak Carbon Emissions, Carbon Neutrality and Ecological Civilisation Concepts in the National Education System*, a *Model Curriculums for Education on Peak Carbon, Carbon Neutrality and Green Living for Primary and Middle Schools* and similar model curriculums for adult and vocational education, higher education and enterprise trainings, and we will also be conducting activities in cities across the nation to educate young people regarding best practice in peak carbon, carbon neutrality and green living and give awards to the best examples.

Attention paid to innovations in ESD curriculums – innovation in learning.

Faced with a future prospect of frequent challenges from environmental disasters and great uncertainties in the outlook for sustainable development, it is essential that educators and learners make the rational choice and decide their responsibility as teachers and learners is to make the school an ecological society and the classroom a place where environmental problems get solved. With that in mind, it is also essential that we rethink and indeed abandon old ways of teaching and adopt in their place new ways of teaching and learning where the educator guides, the learner is proactive and the process is collaborative. This will help make time spent learning in school for the broad mass of primary and middle school students an experience in directly addressing real issues around green living and sustainable development and present an opportunity to take part in their resolution. This will in turn enrich practical experience and make students better prepared in terms of knowledge, capabilities, values and hands-on experience for the demands of building a future green society.

In this regard, we will be carrying out project-based learning experiments on ecological civilisation that innovate in teaching and learning in colleges, primary and middle schools. These will provide a learning platform for getting to understand ecological civilisation, a linked-up platform where multiple scientific disciplines combine and complement one another, a platform were fostering green living is put into practice, where experience is gained in responding to environmental risks and disasters, a platform for innovation in researching and implementing solutions and where people can participate in the advance towards an ecological civilisation. The implementation principles for this project-based learning will be setting environmental topics with multiple disciplines brought to bear, innovations applied where they had previously been absent and the creation of an opportunity for learners to grow together. Specific requirements are for the combination of questions regarding real-world environmental issues, knowledge for building ecological civilisation in the different disciplines and strategies for coping with environmental disasters into integrated multi-theme research; taking the best from each of the various disciplines and combining their tenets so they can work together to help attain project goals; bringing in innovation where none was before in research for project-based learning in an effort to make the time spent learning result in concrete contributions to building an ecological civilisation; cooperative learning in teams so learners can grow together as they acquire knowledge, capacity and values and learn new ways of living.

Emphasis on establishing ESD model schools or other outstanding centres of learning in rural and urban locales – learning institutions.

Schools are important centres for the broad implementation of ecological civilisation and ESD in both urban and rural settings. Studying the experience in nations such as China, Japan and Germany, we find there are eight quality standards for experimental and model schools for ESD: in-school teaching promoting ecological civilisation concepts to both the collective and individuals; a curriculum that has "learning about sustainable development" as its core theme; sustainable learning classrooms becoming the norm; green and smart school campuses as local exemplars of low waste and low emission living; creation of a system to combat and prevent pandemic with staff and student cooperation and implement it effectively; widespread adoption of green living by students and staff; normalising youth participation in the building of ecological civilisation.[3]

In this respect, we will be giving guidance to government and education departments at various levels to help speed up the drafting and revision of specific quality standards and operating regulations for ESD model schools, and we will be organising teams of experts to make regular visits to schools to look for, find and disseminate examples of best practice. These will be used in annual meetings where successful experiences are shared and outstanding principals and educators receive commendation. We will also seek to encourage the establishment of similar schools under various names: green schools, ESD schools, eco-schools, ASP schools, environmental education schools and so on. We will also continue to promote the establishment of ESD model districts in urban and rural locales. Basic standards for these experimental districts include: local government drafting mid and long terms plans for ESD and setting up the necessary institutions; ESD at more than a third of local schools; trainings in ESD for school leadership and all teaching staff; local education authorities to draft ESD curriculums and guiding documents on teaching for ESD and oversee their implementation; local primary and middle school students taking part in a planned fashion in practical ESD and green living public education or science innovation activities, for example in combating pandemics or addressing climate change; setting up local youth activity centres for green living; opportunity for ESD to offer suggestions on greening local society, economy, environment and culture and positive outcomes from the same. At the same time we will be seeking to make education in green living and sustainable development universal so it can take a leading role in the creation of a broad alliance for the building of an ecological civilisation and promote ESD as part of a system of life-long learning.[4]

Encouraging rural and urban young people to take part in environmental activities as individuals or in groups.

At the present time, with an increasingly difficult outlook in the global fight against the pandemic and the response to climate change internationally and multiple challenges to sustainable development on the domestic front, it becomes essential that we encourage the broad participation of young people in local activities to build ecological civilisation in their urban and rural hometowns. In this regard we will be organising practical themed activities for young people to take part in: on healthy living (including green living in terms of consumption, travel, resource and energy economy in the home, classroom, school and community); on combatting pandemic (including preventing infection in the school, classroom, library, canteen, home and community and proposing science and technological innovations); seeking out examples of best practice in urban and rural communities (including in pandemic prevention, earthquake and tsunami safety, drought and flood prevention and control, smog safety and control and responding to climate change); organising a survey of sustainable development issues in urban and rural areas and drafting proposed amelioration measures; making a survey of urban and rural public education in income

growth and local economic revival and the situation for poor households, the disable and welfare recipients, plus drafting proposals for amelioration measures; work to preserve and pass down the best traditional cultural heritage of the various nations and regions (particularly those countries and regions affected by the One Belt One Road initiative); and seeking to understand and protect world cultural heritage and our natural heritage.

Road map for ecological civilisation and ESD

Two broad social functions:

1. education promoting sustainable development in culture and the socio-economic environment;
2. education promoting the building of an ecological civilisation.

Two educational goals:

1. education concentrating on the sustainable development of individuals;
2. education concentrating on fostering a green citizenry.

Three tiers of curriculum setting:

1. National curriculum: implement an "Education for Ecological Civilisation Plus" (EEC+) and ESD+ curriculum;
2. Regional curriculums: develop and implement local EEC and ESD curriculums;
3. School-based curriculums: develop and implement school-based EEC and ESD curriculums.

Two modes of teaching and learning:

1. Sustainable learning classroom

   >*Four principles for teaching and learning:* themed investigations, comprehensive immersion, cooperative activities, equal priority for knowledge and action.

   > *Four methods for teaching and learning*: guide students to make advances in their classroom studies, direct students in the successful completion of reports on their investigation assignments, arrange for student participation in classroom evaluation and cooperative discussion, coach students in the design of plans for problem resolution.

2. Ecological civilisation project learning:

   >Four principles for teaching and learning: ecological themes. Interdisciplinary approach, introducing innovations where previous absent, growing as a team.

   > Four methods for teaching and learning: joint selection of themes by teachers and students; guidance from multiple teachers from different disciplines; team cooperation in critical thinking, investigations and evidentiary research; writing and exhibiting a project report.

Creation of four types of eco-space:

1. Green smart classroom;
2. Green smart campus;
3. Green smart home;
4. Green smart communities.

Four modes of sustainable living:

1. Moderation and simplicity;
2. Low carbon;
3. Healthy living for disease prevention;
4. Healthy and harmonious.

Four expected outcomes:

1. Producing many innovatory educators and outstanding course examples;
2. Producing many excellent schools with their own trademark styles;
3. Producing many inspiring stories of young people working to build ecological civilisation;
4. Producing multiple outstanding leadership figures ready to take the mission of building an ecological civilisation

In general terms, the common and interlinked guiding ideas, basic philosophy, mode of operations, working principles and expected outcomes of the implementation of ESD in learning institutions and the wider education system (including basic education, vocational and adult education and higher education) can be summarised in the "road map for ecological civilisation and ESD".[5]

As we all know, the UN *2030 Agenda for Sustainable Development* with its seventeen goals for sustainable development has set out an ambitious blueprint for social and economic reform and progress over the coming decade. The report of the 19th Congress of the Communist Party of China set out a vision of the future to be created by goals set for the 2020 to 2035 period and then on to 2050. With this as the background, an active interest in the result of related international research and a willingness to learn from it and the inclusion and all-round implementation of ecological civilisation goals and ESD in the 14th Five Year Plan are bound to have an enormous positive impact on the "creation of a high-quality education system" (the development goal set for education in China over the coming five years).[6]

Looking to the future, we firmly believe that achieving the UN's seventeen sustainable development goals and realising China's own vision for 2035 and 2050 are significant for national prosperity and local development and are a vital factor in the individual health and lives of every citizen as well as the well-being of their families and a sustainable future for their careers. Faced with a series of ecological crises and the severe challenges of unsustainable development, it is essential that we implement EEC and ESD in our national education system and life-long learning system in a major way. In this regard, it is essential that everyone, be they state official, business manager, academic, educator, media worker or working at the community grassroots, takes inspiration from the spirit of the fight against COVID and is proactive in grasping the fundamentals of EEC and ESD, that they speed up their preparedness and work constantly to improve their own attainments in EEC and ESD; they can then work to encourage their millions of fellow citizens to come and join in the work of advancing ecological civilisation and sustainable development through education, learning, publicity, training and innovations in praxis and so contribute to the more rapid achievement lasting peace and sustainable development for all.

|| **Shi Gendong**

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Hyun-Ah Choi and Bernhard Seliger

Korea's Green New Deal between short-term political goals and long-term structural change

When the COVID-19 pandemic hit the world, South Korea was one of the first countries answering with a large-scale deficit-spending programme at the same time purporting to tackle the issue of growth and green transformation. This Green New Deal won worldwide acclaim, even when details of it were scarce. But what does it really mean? Is it merely "greenwashing" of government spending, or will it be able to bring South Korea to a growth path at the same time stable, carbon-neutral and sustainable? In the recent environmental history of South Korea, the large-scale afforestation starting in the 1960s was an example for a successful green transformation. However, the results are now challenged due to the alleged poor carbon absorption characteristics of forests. This paper discusses South Korea's New Green Deal, its impact on environment and the economy, and in particular the Korean forest policy.

Keywords:
South Korea - Green New Deal - Sustainable Forestry - Green Growth - Afforestation

Korea's Green New Deal between short-term political goals and long-term structural change

|| Hyun-Ah Choi and Bernhard Seliger

1. Introduction – from "the world's greatest carbon villain" to climate hero?

The 2021 G 20 summit and the run-up to the Glasgow UNFCCC COP 26 both were dominated by the debate how modern industrial societies can at the same time become carbon neutral, a goal deemed indispensable to cope with global warming, and still maintain economic growth, indispensable not only to overcome in the short term the economic ramifications of the Covid-19 pandemic, but also in the long-run to achieve development and maintain wealth and comfortable life styles. This debate is not at all new: when the famous Club of Rome report on the "limits of growth" was published in 1972, the debate was wide open. Ironically, though none of the doomsday predictions of the Club of Rome, which in a nutshell predicted the end of most important raw materials and energy sources by the year 2000, ever came close to true, this report is today cited by many environmentalists as a proof that action on climate is urgent. This time, the focus is a little different – global warming is the target, no longer resource limitations – but the argument is very similar; we have only one earth, and mankind, in particular developed countries, overuse the capability of this world to store and cope with CO^2 by far, thus bringing the earth's ecosystem to a collapse. In a vulgar, but widely-believed version, this argument also maintains that market economies brought this disaster about, since they grow most, and that only decisive state intervention can solve these problems, though all evidence points to the contrary, namely that where states were entirely responsible for the economy, in socialist states, environmental problems were by far the biggest.

In this situation, countries try to combine policy actions to overcome the severe short-term contractions resulting from crises with long-term goals to de-carbonize the economy. Basically, nothing is wrong with this, indeed it would be laudable to achieve these goals in unison. However, often short-term goals might be more powerful than long-term, lofty visions, and then easily policy can only become green in name – "greening" policies becomes "greenwashing". The greenwashing of otherwise unsustainable policies at the company level or state level brought about a whole literature critically dissecting it. In South Korea, the first very visible green initiative was the "green growth" policy under President Lee Myung-Bak after the global financial crisis of 2008-2009. That time, eighty percent of the funding of the post-crisis stimulus project went to green projects. However, soon allegations were raised that much of the project was not green at all, and indeed the signature "four river restoration", itself a euphemism, had severe negative ecological consequences. Nevertheless, President Lee was very successful in marketing green growth, and in record speed a new international institute, the Global

Green Growth Institute seated in Seoul, was founded. Given the necessity to convince the population in South Korea and worldwide that the decoupling of growth and carbon emissions was an important policy task, this policy and institute definitely have their merits and indeed a lot of the criticism of President Lee's policy might have simply been envy by his opponents that he came up with this policy.

Similarly, South Korea's current President Moon Jae-In announced soon after the Covid-19 pandemic first became a worldwide challenge, trade froze and local economies were devastated by various degrees of lockdown, a "Green New Deal" project. This project again was eminently political in nature: first announced ahead of the April 2020 Parliamentary election, it certainly helped the landslide victory of the ruling Democratic Party. Also, it made for the first time in Korea a pledge for net-zero emissions by 2050. Accordingly, commentators like Troy Stangarone of the Korea Economic Institute of America praised it a lot in advance. It had also a lot of appeal to voters suffering from economic misfortune, since the "new deal" aspect promised redistribution of wealth and "economic justice" (whatever that means) for the poorer. But will this programme really achieve a turnaround of carbon emissions? One of the political attractions to set goals far in the future (2050, 2045 or 2030) is that politicians are not really politically responsible anymore when it comes to the set date. It is a fact that despite the green growth policy, carbon emissions in South Korea grew to an extent that activists called it "the biggest climate villain" (Watts 2020). And, in South Korea – as in Germany – another conflict line shows: Moon at the same time pledged to end nuclear power and fossil power. But the share of renewable energy is tiny and can by no means be expected to grow to such an extent that it can in the foreseeable future substitute both nuclear and fossil fuels. So – will the stimulus be rather a short-term economic programme greenwashed? Will it be a long-term transformation, but to the detriment of growth? It is important to recall that there was indeed one programme in South Korea, which very successfully combined economic and ecological benefits, namely the large-scale afforestation under President Park Chung-Hee since the 1960s.

The remainder of this paper is organized as follows: the second sections looks closer into the current South Korean Green New Deal. Section three will look into economic and ecological effects of green policies in Korea, the fourth section looks at the successful afforestation policy of South Korea, followed by a conclusion (5.).

2. The Green New Deal – An Overview

When in early 2020 the Covid-19 pandemic broke out, South Korea was one of the first countries outside of China hit hard by the outbreak. Following a mass outbreak in Daegu early on, tourism and international flights collapsed, then also trade and the local economy was stymied by various degrees of a soft lockdown, though South Korea never employed the stricter form of lockdown like Australia or many European countries. Before the April 2020 elections to the National Assembly, which ended with a landslide victory for President Moon Jae-In and his Democratic Party, Moon announced a Korean New Deal to cope with the economic fallout of the pandemic. The K-New Deal,[1] launched from July 2020, pledged originally 135 bn. USD for two programmes: A Digital New Deal, making the economy fit for digital transformation, e.g. through smart cities and smart healthcare projects and the use of AI, and a Green New Deal, focusing on renewable energy, green infrastructure projects and green industrial transformation, for example in the car manufacturing sector. Of this 135 bn. USD, two thirds (96.3 bn. USD) should come from the state coffers, 21.2 bn. USD from local governments and the remaining 17.3 bn. USD from the private sector. The Green New Deal had the lion's share, with 61.9 bn. USD planned to be invested in green technologies. By this, beside the digital and green transformation, also job security was targeted and it was hoped that by 2025 all in all between 660.000

and 1,9 million jobs could be created. Job creation was in a political sense essential, since President Moon had started his presidency on the double pledge to reduce youth unemployment and raising minimum wages – while he achieved the latter, predictably he exacerbated the former problem and were was a lot of youth discontent. Another important goal to achieve with the programme was a more equitable spread of investment outside the Seoul Metropolitan region. Seoul, the surrounding Gyeonggi province and Incheon, the harbour of Seoul, together comprise half of the population, and not more than half of the investment should be in this region, to bring innovation and jobs to other provinces, too.

Some of the announced measures were very concrete – for example, a subsidy programme for buying environmentally more friendly cars was announced, and in 2021 USD 17 million were allocated for people buying electric cars and up to USD 33.5 million for people buying hydrogen fuel-cell vehicles. While South Korea only experienced a mild contraction in 2020 of around one percent of GDP – only China and Norway fared better among industrial powerhouses -, nevertheless soon the stimulus was deemed to be insufficient by the government. Therefore, a year after the first stimulus President Moon announced another stimulus package, dubbed "Korean New Deal 2.0". This expands the original 135 bn. USD programme to 191 bn. USD. The sectoral focus was only slightly expanding from the original New Deal proposal; the Digital New Deal focused on industries like 5G, artificial intelligence and big data. As new buzzwords, the interconnected virtual platforms dubbed "metaverse" and technologies such as blockchain and cloud computing were stressed. The Green New Deal is set to promote investments in renewable energy, ecofriendly buildings, electric vehicles and telemedicine. Especially the (green) hydrogen technology, i.e. producing hydrogen by water and renewable energy, is explored. Among others, also better emissions monitoring is promised. With this expanded programme, the Moon administration hopes to create even more jobs than before, namely a total of 2.5 million. Additionally, a so-called Human New Deal of USD 44 bn. means the investment in the social safety net, like job training, education and childcare support.[2]

The Green New Deal might have a new focus for South Korea, but actually the basic structure is not very different from former industrial programmes. Indeed, these programmes are remnants from a time when the South Korean economy grew according to quite elaborate indicative planning set by the government. The mixture of market pressure in world markets and selective incentives for exporting companies had been very successful from the mid-1960s to the mid-1980s, and South Korea in that time logged the highest growth worldwide. While in the more mature economy afterwards most of the planning tools were abandoned, still strong selective incentives focusing on investment in certain "future-oriented" sectors remained. Typically, financing was done in a mixed way by the government and companies, with more or less subtle pressure on companies to join the government's efforts. For the Green New Deal, South Korea in 2021 set up a Korean New Deal Fund of KRW 20 tr. (around USD 17 bn.), 65 of which should come from private funds to provide low-risk investment opportunities for private investors, as the government would absorb losses incurred by the private investors.[3]

3. The Green New Deal and Korea's Market Economy: greenwashing, deficit-spending, and a return of planification?

When President Moon Jae-In announced the Green New Deal, it was lauded in unison by national and international media. South Korea, it seemed, successfully contained Covid-19, and now would find a way out of the corona-induced recession. Indeed, before the Parliamentary Election Moon sold the Korean experience as a model for the world to follow. However, the reality might be much less glamorous. Already the goal of carbon-neutral green growth under President Lee Myung-Bak

failed – indeed, despite the policy, through the surge of coal use and carbon emissions South Korea by far exceeded what its obligations under the Paris climate agreement made necessary – relatively more than any other nation. The biggest problem seems to be that while green growth investment may generally go into the right direction, there is no guarantee that the complete package of K-New Deal investment will have a positive or negative net effect. Some of the measures are simply recycled existing policies, others might even be counter-productive to growth. The simultaneous exit from nuclear and coal power is currently simply impossible. Measures to ease the increasing spending constraints of citizens, like the temporary cut of the fuel tax by twenty percent, directly contradict policies to curb CO_2 emissions. Another example is the hype surrounding hydrogen fuel. While green hydrogen fuel really could be an energy for the future, currently mostly "brown" hydrogen fuel is used, made by electricity from coal and not being superior to traditional fossil fuel. Therefore, environmental groups often claim that many measures of the New Green Deal are indeed greenwashing of industries.

The second criticism of the programme concerns the question of finance for the New Green Deal. Generally, the idea to have companies participating in the finance is correct. However, the largest part of funding comes from state coffers, and it is questionable if many of the measures financed really qualify as investment, or not rather as consumption. While it might be necessary to transform the economy to perform with less carbon emissions, can this at the same time lead to sustainable growth and job growth? The *Korean New Deal: National Strategy for a Great Transformation* states that the government aims to transform South Korea into a smart country at the centre of a digital transition, a green country achieving the balance among people, nature and growth and a safe country with strong employment and social safety nets. It seems dubious that all this can be achieved simultaneously. And financing this programme by debt means that later generations have to pay back the debt. Will the growth part of the green growth programmes be strong enough to allow them to do so?

Finally, any large-scale state-financed programme of industrial transformation, and this is the challenge of adaptation to climate change, has to cope with the limited knowledge of policy makers. How can successful new industries and forms of energies be identified? "Against" the market? While in the past, the selective incentives for exporting companies led to the development of a strong export sector, it is questionable what the effect of subsidies for firms complying with the New Green Deal goals with bring them. When under the Lee Myung-Bak government a new resource policy was initiated, it ultimately failed and left horrendous debt. The central government had pushed public and private companies to invest in certain resource developments, but failed to select the "winners" over the "loosers". Why should the Moon administration be more successful? The new policy also suffers from the fact that in an important field, namely financing energy projects, the Green New Deal does not lead to more, but to less investment. In 2016 and 2017 alone, South Korea provided more than USD 1.1 bn. in public funds for the construction of new coal power plants overseas, in projects often linking it to Official Development Aid. This, South Korea vowed, will end, but this will also mean that South Korea's attractiveness as ODA partner is somewhat reduced.

One of the most promising and potentially economically efficient ways to reduce GHG emissions are functioning emissions trading systems (ETS). South Korea for some years has a reasonable well-functioning ETS which learned from the mistakes for example of the European system, where too generous grandfathering led to a breakdown of prices. Potentially, this could be very attractive as a bilateral, regional or international system. For example, South Korean firms could save much more CO_2 if investment for emissions reduction in North Korean factories or power sta-

tions were possible. Such clean finance approaches have been started with the Clean Development Mechanism, but in the current Green New Deal play a very minor role. It might be argued that it is unfair to put too many expectations into the Green New Deal – but this is exactly, how the deal was sold to the public. And by these standards, it will likely fail on many, if not all envisaged goals.

4. An example for successful green growth policy - Long-term structural change in Korea's forestry strategy

The government of South Korea has designed a new strategy to create a carbon neutral society through the Korean New Deal Policy in 2020. This policy is divided into the Digital New Deal and the Green New Deal. As for the Green New Deal, cities and living areas will be turned into green infrastructure based on renewable energy. Considering the current state of forests and timber production plans, carbon removal is estimated to decrease by 30 percent from the current level by 2050. Innovative forest management, therefore, is a key to improving the aging forest structure, promoting the use of wood products/timber and increasing carbon stocks. The South Korea Government plans to increase carbon sinks by creating urban green spaces for recreational use, restoring degraded forestlands and tree-planting in underutilized lands. The Government will continue its forest management to maintain the forest carbon removals at the highest level possible by changing tree species and implementing programmes to keep the forests healthy.[4] In this part of the plan, Korea Forest Service (KFS) announced the three billion new trees will be planted over the next 30 years after logging aged trees to offset carbon emissions and six trillion won (US$5.3 billion) will be invested to create new forest by 2050 on 20 January 2021.[5] This announcement has been raising controversy among government, academics, and civil society in South Korea.

In the past, South Korea's once devastated forests – due to common pool problems throughout the Choson period, exploitation during Japanese colonization (1910-1945), deforestation in the Korean War (January 1950-July 1953), shifting cultivation, and indiscriminate felling –were reforested within a short period of time through the 1st and 2nd Erosion Control and Greening 10 Year Project (1973-1987). South Korea has wide knowledge on how to successfully accomplish this, as it has been restoring barren forest land and is acknowledged by the international community as the only country to implement successful short-term reforestation. By 1977, the total area of plantations had reached 643,000 ha in the country.[6]

Table 1. Area of tree plantation

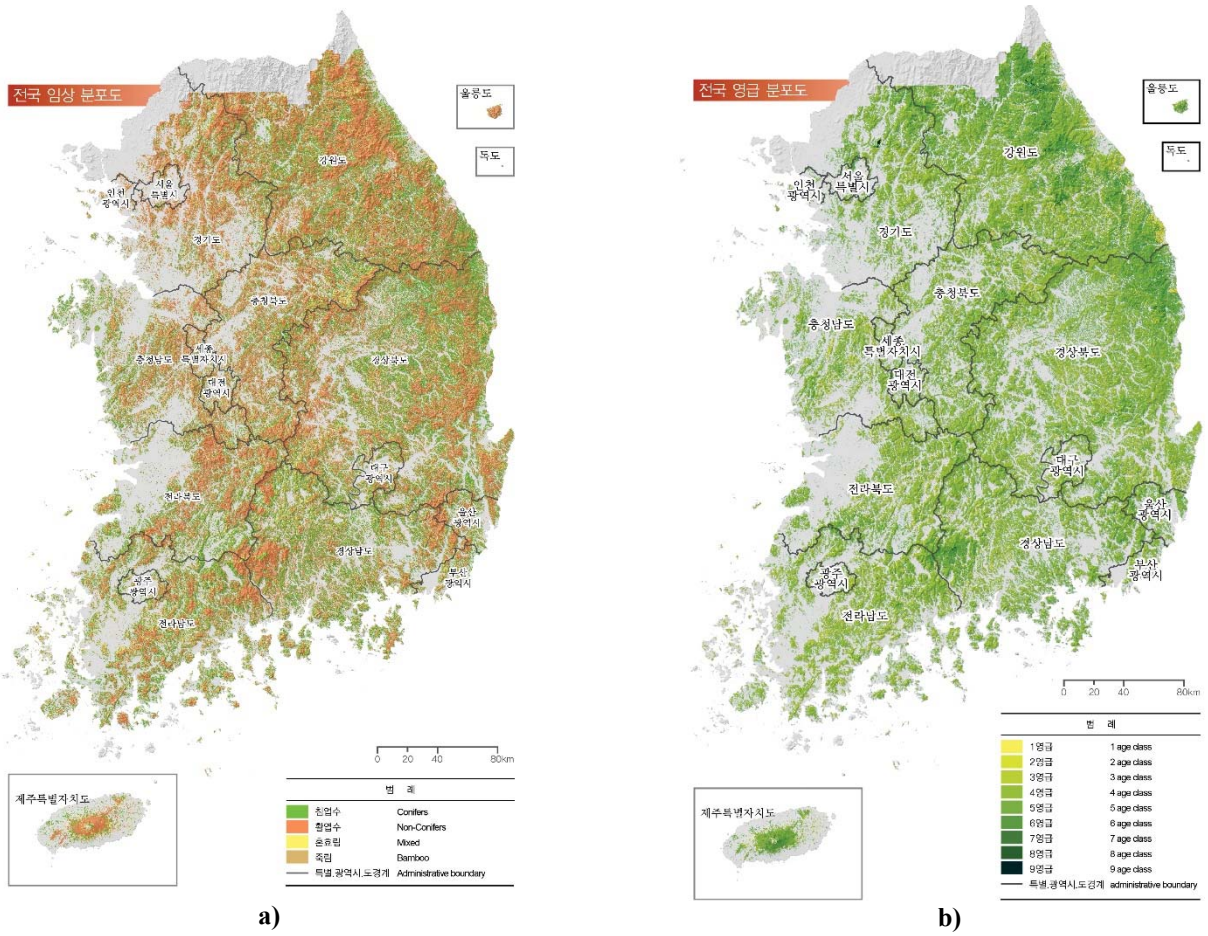
	Area (ha)	
	Planned	**Established**
1959-1966	800,000	
1967-1972	514,000	436,000
1973-1977	207,000	207,000
Total	1,521,000	643,000

Source: Song, 1982

After the tree-planting period, South Korea established the 3rd Mountainous Region Resource Plan (1988-1997), promoting the development of forest income and the enhancement of public function, and expanded international forestry cooperation having the 1992 Rio United Nations Conference on Environment and Development at its basis. The 4th Basic Forest Plan (1998-2007) and 5th Basic Forest Plan (2008-2017) aimed to build a sustainable forest management infrastructure, foster competitive forestry business, and promote a pleasant forest environment. The 6th Basic Forest Plan (2018-2037) aimed to establish sustainable forest management. It has been focusing on forest policies in the concept of forest welfare that promote health and rest through forest bathing, forest recreation, and forest healing activities in well-developed forests.

The current total forested area of South Korea is approximately 63 percent or 6,335,000 ha of territory. The distribution of

Figure 1. Distribution of forest type (a) and forest age classes (b) in South Korea

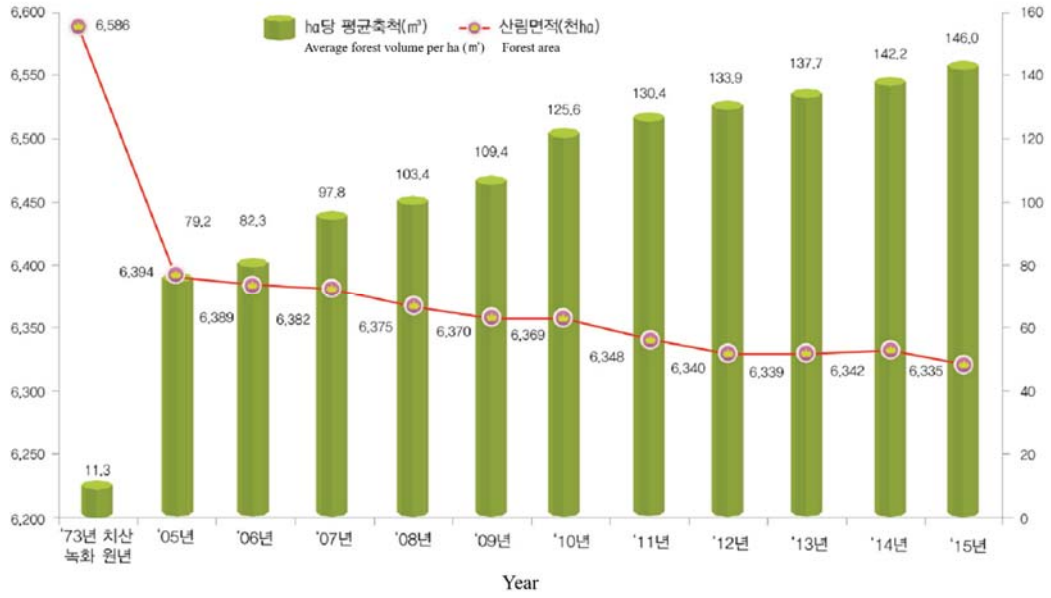


Source: Korea Forest Service 2021[1]

forest area by age-class is 1,797,000 ha, or 26.8 percent of trees under 30 years old and 4,377,000 ha, 6.1 percent, of trees over 31 years old. The dominant vegetation type is needleleaved forest that covers 42 percent of the area, while broadleaved forest covers 26 percent and mixed forest covers 30 percent, all providing rich habitat for wild animals.[7]

Most of the planting of trees took place in the 1970s and 1980s and now the trees are aging in South Korea. The age class of trees are currently in 3-4 age class; whose net growth volumes are the highest in their lifespan. In the future, the trees in South Korea will age, the percentage of forestlands at age-class 6 or older (Figure 1), whose net growth volume declines rapidly. The National Institute of Forest Science under KFS estimated that the percentage of forestlands at age-class 6 or older will increase from 10.2 percent in 2020 to 32.9 percent in 2030 and accordingly, the annual average net growth volume per hectare will decrease from 4.3m^3 in 2020 to 2.6 m^3 in 2030 and further down to 1.9 m^3 in 2050 (Figure 2).[8] KFS points out and claims that aging trees older than 30 years have poor carbon absorption capacity in South Korea. However, this plan is more focused on use of timber without consideration of the biodiversity in the forestry and forest services. The civil society such as Korea Federation for Environmental Movements and Forest for Life do not endorse this carbon neutral logging policy. According to the Korea National Arboretum under the KFS analysed the annual average carbon absorption capacity between large and normal-sized trees. The average carbon absorption capacity is 27.5 kg in the 1990s, 29.4 kg in the 2000s, and 35.8 kg in the 2010s in South Korea.[9]

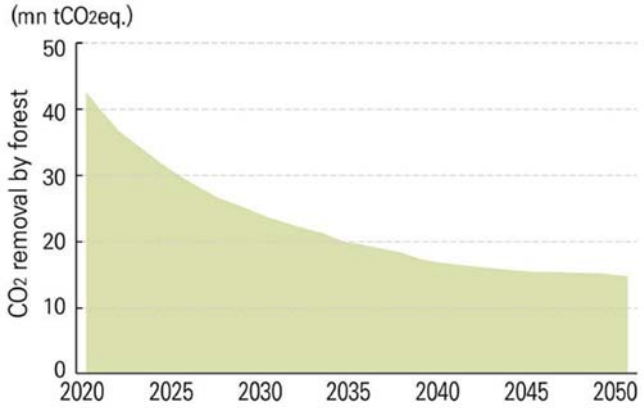
Figure 2. Average forest volume per ha (㎥) and forest area in South Korea



Source: Korea Forest Service 2016

Forest ecosystems support human well-being in many ways. They provide us with food, feed, fibre, and ecological resilience to climate change. The Korean society cannot make a decision or choose one direction now. To provide a more balanced perspective, it needs to understand the importance of carbon neutrality and forest management, various viewpoints for solving this problem. It also needs discussion among government, academic and the civil society base on the scientific approaches. The plans to substitute older forests by younger ones based only on the carbon absorption characteristics is dangerous, since it neglects the comprehensive function of forests, including growing biodiversity in older forests. Other conflicts also loom large – if renewable energy indeed will be expanded dramatically, where should solar panels and windmills go – certainly, urban areas and the relatively small part of agricultural land are much less feasible than the forests. But this requires additional logging, the building of large ways to bring in gigantic wings of the windmills and ensure smooth operation of the wind power stations. Afforestation in the 1960s to 1980s was indeed a true green growth project – it led to the large-scale rehabilitation of environment, brought jobs and helped to ease the transformation from a rural to an industrial society. Can the New Green Deal achieve the same?

Figure 3. Estimated CO_2 removal by forest



Source: The Government of the Republic of Korea 2020

5. Conclusion

South Korea in the first phase of the Corona pandemic won praise as a country successfully insulating itself from the most devastating economic consequences. However, a slow start of vaccinations and later a protracted situation due to less-than-expected safety from vaccinations tremendously hurt small business owners. While despite the pandemic large companies, in particular in the semicon-

ductor business, experienced record exports and earnings, the problem of a lack of a backbone of strong, export-oriented Small and Medium Enterprises meant that job growth did not follow the economic recovery at the same pace. In this situation, it is not easy to start another radical transformation of the economy without a clear way of how to ensure carbon neutrality and industrial survival at the same time. For example, despite having no natural fuel resources, South Korea is a leading petrochemical producer. This must be completely reversed, if carbon neutrality is to be truly achieved.

For the South Korean society, a much more comprehensive debate is necessary. Already now, the phase-out of nuclear power has been called into question. Without stronger nuclear power, carbon neutrality remains a pipe dream. Additionally, pledges to international treaties might become difficult to achieve, if subsequent governments will renege on pledges by the current one. This has been seen in the US recently, and in the polarized, short-term oriented South Korean political system, this can easily happen, maybe already with the presidential elections next year. Then, not much will remain from the Green New Deal than a short-term stimulus.

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Sandeep Kumar Dubey

Climate Action and the Indian Imperative

Due to their varied capabilities, collective responses of the parties to the Paris Agreement to climate change remain discrete and differentiated. The climate finance and the technology transfer to date from the developed countries to the developing ones fail to bridge the capability gap owing to the skewed focus on mitigation action. This paper attempts to explicate as to why it is important for India, a developing country, to raise its climate ambition by enhancing climate finance mobilisation, developing adaptation technology and strengthening its domestic polycentric climate governance.

Keywords:
adaptation action - climate action - climate change - climate finance - climate technology transfer - federalism - mitigation action - nationally determined contributions - Paris Agreement - polycentric climate governance

Climate Action and the Indian Imperative

|| Sandeep Kumar Dubey

In recent years, the concept of the circular economy (see box below) has gained increasing attention in sustainable development discussions. For high-income countries, it offers opportunities to shrink their outsized

Climate change has emerged as the most systematic threat to humanity.[1] Global warming of 2ºC above pre-industrial levels would result in devastating impacts, causing sea level rise, a sea-ice-free Arctic Ocean, extreme droughts, precipitation deficits and water stress, warns the Intergovernmental Panel on Climate Change (IPCC) in its report, entitled "Global Warming of 1.5 ºC".[2] Alarmingly, the report also underscores that already in 2017, the warming reached approximately 1ºC above the pre-industrial levels and has been steadily increasing further at the rate of 0.2ºC per decade (high confidence).[3]

Given that the impacts of climate change are unfolding on a global scale, efforts at the international level – through supranational bodies – are being made to keep climate change within the assumed manageable limit. The Paris Agreement, concluded in 2015, aims at limiting the temperature well below 2ºC and urges all the parties to the Agreement to pursue 'efforts to limit the temperature increase to 1.5ºC'.[4] To limit the temperature below 2ºC, the Agreement calls on the parties to 'prepare, communicate and maintain successive nationally determined contributions (NDC)'[5] which in essence 'outline and communicate their post-2020 climate actions'.[6] As of now, all of the 191 parties to the Paris Agreement have submitted their first NDCs, out of which eleven parties have already submitted their second NDCs as per the record of the interim NDC Registry. [7] The NDC Synthesis Report, published on 17th September 2021, avers that the estimated reductions resulting from the full implementation of the NDCs (including both conditional and unconditional elements) fall far short of what is required to limit the temperature well below 2ºC.[8]

What is clear is that even if full implementation of all the NDCs takes place, the temperature increase is quite likely to surpass the 2ºC above the pre-industrial levels. What is worse is that full implementation of the NDCs, especially of their conditional elements, is already doubtful as it would require huge domestic financial resources, international financial assistance, clean technologies, technology transfer from developed countries to developing ones and probably changes in the existing intellectual property (IP) protocols[9] which prevent smooth technology transfer and its use. Two things become important here in order to achieve the Paris Agreement's goal of limiting the temperature well below 2ºC. One is that the parties to the Agreement must appropriately increase their climate ambition and the other is that the parties must ensure full and proper implementation of their respective NDCs. For this, adequate climate finance and technology transfer from the developed countries to the developing countries are a must as it would encourage the developing world to raise their climate ambition and help them meet their NDCs.

Trends in Climate Finance

When it comes to climate action to address climate change, the apparent position of the developing countries is that the developed countries should contribute to most of the mitigation efforts at their level based on the principle of common but differentiated responsibilities and respective capabilities (CBDR). At the same time, in pursuit of the principle of equity as mentioned in the Paris Agreement, the developed countries should also support the adaptation actions in developing countries to protect affected and vulnerable people from the adverse impacts of climate change. These sentiments were reflected both in the UNFCCC 1992 as well as Paris Agreement 2015. According to clause 4 of Article 4 of the UNFCCC, "The developed country Parties and other developed Parties included in Annex II shall also assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects."[10] This was recapitulated in clause 1 of Article 9 of the Paris Agreement which says, "Developed country Parties shall provide financial resources to assist developing country Parties with respect to both mitigation and adaptation in continuation of their existing obligations under the Convention."[11]

Accordingly, developed countries transfer funds to developing countries to fight climate change. However, the funds transferred are predominantly for mitigation efforts whereas the developing countries would want more for adaptation action than mitigation, to deal with the adverse impacts of climate change. This was negotiated in the Paris Agreement, clause 4 of Article 9, which categorically adds that climate finance "should aim to achieve a balance between adaptation and mitigation".[12]

Talking about aggregate trends in (public and private) climate finance, a report of the OECD, entitled "Climate Finance Provided and Mobilised by Developed Countries in 2013-18" says, "Mitigation continues to represent over two-thirds (70%) of the 2018 total, adaptation 21%, and cross-cutting the remainder."[13] In the total climate finance, the report adds, "over 93% of private climate finance mobilised by developed countries over 2016-18 benefited mitigation (...) In contrast, adaptation and cross-cutting each accounted for 3% to 4%. The respective relative shares of mitigation, adaptation and cross-cutting were almost identical in each of the three years."[14]

The continued skewed climate finance focus on mitigation action has led to vast adaptation gap in the developing countries, which in turn has led to increase in climate risk. UNEP's Adaptation Gap Report from 2020 critically points out, "...while nations have advanced in planning and implementation, huge gaps remain, particularly in finance for developing countries and bringing adaptation projects to the stage where they bring real reductions in climate risks. Public and private finance for adaptation must be stepped up urgently, while faster implementation is required on adaptation projects."[15] The estimated annual adaptation cost in developing countries was USD 70 billion in 2020, which is expected to reach USD 140-300 billion in 2030.[16] Not much of it can be expected to be supported under climate finance if the skewed focus on mitigation action continues. For example, in 2016, 2017 and 2018, the climate finance provided exclusively for adaptation was USD 10.1 billion, USD 13.3 billion and USD 16.8 billion respectively.[17] This trend is unlikely to change given the fact that developed countries are yet to meet the USD 100 billion target for mitigation by 2020 as was agreed in the Copenhagen Accord 2009 made under COP 15. Clause 8 of the Accord reads, "In the context of meaningful mitigation actions and transparency on implementation, developed countries commit to a goal of mobilizing jointly USD 100 billion dollars a year by 2020 to address the needs of developing countries."[18] Former OECD Secretary-General Angel Gurría is reported to have said, "Climate finance to developing countries continues to grow but in 2018 was still USD 20

billion short of the 2020 goal of mobilising USD 100 billion."[19] Here it would also be worth mentioning that within public climate finance, which constitutes the largest share of total climate finance provided and mobilised, developmental loans formed the largest chunk (see table 1), and that trend continues to rise.

The repayment of these developmental loans place extra burden on the developing countries which already face financial barriers in meeting their existing climate ambition.

Public Climate Finance 2016-18

	2016		2017		2018	
	USD billion	%	USD billion	%	USD billion	%
Loan	33.6	71.64	39.8	73.03	46.3	74.44
Other instruments	13.3	28.36	14.7	26.97	15.9	25.56
Total	46.9	100	54.5	100	62.2	100

Source: data taken from OECD (2020), Climate Finance Provided and Mobilised by Developed Countries in 2013-18, OECD Publishing, Paris, https://doi.org/10.1787/f0773d55-en.

Trends in Technology Transfer

Like climate finance, in case of the technology transfer too, overt focus on mitigation can be observed. For example, as per the fourth Biennial Reports (BR) submitted by Annex I, Parties to the UNFCCC Secretariat, out of all the 24 technology transfers to India only four focused exclusively on adaptation and one on mitigation and adaptation both (see table 2). The skewed preference for mitigation action can be seen in the technology transfer from Germany to India. Post COP17, none of the technologies transferred from Germany were for adaptation (see table 3).

Technology Transfer to India (BR4)

No.	Country	Total	Mitigation	Adaptation	Both
1	Germany	1	1	0	0
2	Spain	4	4	0	0
3	Italy	2	2	0	0
4	Japan	15	11	4	0
5	Russia	1	1	0	0
6	Sweden	1	0	0	1
	Total	24	19	4	1

Source: data taken from UNFCCC, Biennial Reports Data Interface https://www4.unfccc.int/sites/br-di/Pages/TechnologySupport.aspx

Technology Transfer from Germany to India

Report	Total	Mitigation	Adaptation	Both
BR1	1	1	0	0
BR2	2	2	0	0
BR3	2	2	0	0
BR4	1	1	0	0
Total	6	6	0	0

Source: data taken from UNFCCC, Biennial Reports Data Interface https://www4.unfccc.int/sites/br-di/Pages/TechnologySupport.aspx

Lack of technology transfer for adaptation action poses a challenge to the full implementation of NDCs of the developing countries. For the adaptation technology transfer to happen adequately, a paradigm shift would be needed in approach, market and science. The Technology Executive Committee of the UNFCCC, in its Brief 6 rightly points out, "Compared to mitigation technologies, technologies for adaptation face further barriers, including the lack of a revenue model for some technologies, the need for buy-in (…) and uncertainty about the benefits of adaptation."[20]

India's Climate Action

Like other developing countries, India too faces serious threats emanating from climate change and thus it is imperative for India to take adaptation and mitigation actions to deal with climate change. Surrounded by seas and oceans from three sides and with the Himalayas in its backyard, India remains one of the most vulnerable countries to climate change. Among others, India's water resources are likely to be hit the most by climate change. India's Second Biennial Update Report to the United Nations Framework Convention on Climate Change (2018) foresees, that "Climate change will lead to an intensification of the global hydrological cycle and can have major impacts on regional water resources, affecting both ground and surface water supply."[21] In 2018, the Ministry of Environment, Forest and Climate Change commissioned a study on Climate Change and Water Resources in India. The study points out some alarming facts. It says, "Indian water demand is expected to rise by over 70% by 2025 and India is projected to suffer severe water stress by 2050 (...) The alarming rate of groundwater depletion, the variability of precipitation coupled with the uncertainty brought in by climate change, inefficient irrigation water use and deteriorating water quality on the one hand and burgeoning water demand on the other side depicts the grim reality of water crisis in our country."[22] The study further adds, "The water availability projected for the year 2025 is 1,434 cubic meter per year per capita…which will further dwindle to 1,140 cubic meters per year per capita by 2050, the year by which our population is expected to stabilise. The total water demand is expected to meet availability by 2025, and the absolute water requirement by 2050 is assessed to be 1,450 BCM (...)"[23]

Lifeline for the development processes, water as a sector needs urgent support in terms of adaptation action to ensure water security in India. Domestically, strong institutional structures and coordination among various governing bodies, sectors and stakeholders are a must to facilitate adaptation action in the water sector. In July 2016, the then Ministry of Water Resources, River Development and Ganga Rejuvenation (now Ministry of Jal Shakti) established a committee, the Committee on Restructuring the Central Water Commission (CWC) and Central Ground Water Board (CGWB) of India, to suggest institutional reforms for water governance to deal with the water challenges that India faces in the 21st century. The Committee, in its report, entitled "A 21st Century Institutional Architecture for India's Water Reforms", points out that there exists "very little co-ordination, discussion and collaboration" between CWC and CGWB, the two key water institutions within the same Ministry of Jal Shakti and these two institutions work "within the silos of groundwater and surface water respectively". The Committee suggested merging the two institutions. However, it did not happen due to internal protest and pressures within the Ministry.[24] Inter-ministerial coordination has been another hurdle on the way to effective water governance. Realising that, the two ministries – the Ministry of Water Resources and the Ministry of Drinking Water – were merged into a single ministry in May 2015 as Ministry of Jal Shakti with the hope that it would lead to an integrated water resources management.[25]

As indicated above, lack of coordination among different governing bodies has led to the emergence of data silos, and one of the biggest challenges to effective water governance is the institutional perseverance with maintaining these data silos.[26] the role of data in conflict resolution is public knowledge now. In the face of climate change, the states are likely to have different climate modelling and projections if they work in silos, leading to conflicting information. For example, lack of adequate data and information on Cauvery river water and a difference set of data provided by Karnataka and Tamil Nadu are the key reasons why the Cauvery river water dispute lingers on.[27] The Second Administrative Reforms Commission of India way back in 2008 had recommended – as part of the ca-

pacity building for water conflict resolution – that there be "a network of data banks and databases integrating and strengthening the central, state and basin-level agencies and improving the quality of data and the processing capabilities".[28] To bridge the data gap, the National Water Mission under the National Action Plan on Climate Change (NAPCC) accords high priority in ensuring 'comprehensive water data base in the public domain'.[29]

In addition to the domestic efforts and churning on water governance, technology support from the developed countries would play a key role in transforming the water sector. However, the data on technology support from the developed countries to India shows that most of the technology support given or planned to be given are for the energy and transport sector, due to a skewed focus on mitigation action. Out of the ten developed countries, only one country (Japan) provided technology support in the water and sanitation sector.[30] This trend needs to change so as to catalyse the transformation of the water sector and enable it to withstand the impacts of climate change. Similarly, focus of finance needs to change adequately towards adaptation action which is at present, as India complains, "highly inadequate in scale, misplaced in scope without balance favouring mitigation strongly over adaptation, and dominated by loans rather than grants".[31]

On mitigation, India's position has been in line with the principle of common but differentiated and respective capabilities (CBDR). Like adaptation action, institutional support and governance play a major role in mitigation action too. The Fifth Assessment Report of the IPCC remarks, "Institutions and processes of governance (…) shape and constrain policy-making and policy implementation in multiple ways relevant for a shift to a low carbon economy."[32] In 2008, for the first time, India came up with a significant policy instrument i.e. the National Action Plan on Climate Change (NAPCC) to systemise and formalise its climate action to "assist the country to adapt to climate change"[33] and to "launch the economy on a path that would progressively and substantially result in mitigation through avoided emissions."[34] Mindful of its federal set up, in 2009 the Central Government asked the states to prepare and submit their respective action plans in line with the NAPCC to provide institutional support to operationalise the NAPCC.[35] As of today, 27 states and 6 Union Territories have drafted and submitted their State Action Plans on Climate Change (SAPCC) to the Central Government[36], which attempt "to mainstream climate change concerns in their planning process'.[37]

Given that the impacts of climate change are diverse in terms of time and scale, a polycentric approach holds the key to effective and enhanced climate action, especially in a federal institutional setting. According to the theory of polycentricism, developed by Elinor and Vincent Ostrom, "social systems with multiple layers of decision-making and a mix of shared and individual responsibilities among subunits often have advantages in the provision of public goods and other aspects of governance."[38] In Ostromian framework of polycentricism, both polycentricism and federalism are intricately interlaced, though polycentricism goes far beyond federalism and often resist being subjected to a hierarchical command structure and enjoys autonomous decision making power.[39] Michael D. McGinnis and Elinor Ostrom elaborate further, "A federal system may consist only of a sequence of neatly nested jurisdictions at the local, state or provincial, and national levels, but a polycentric system also includes cross-cutting jurisdictions specializing in particular policy matters, such as an agency managing a river basin that cuts across state lines."[40]

Polycentric governance lies at the heart of Indian policy due to its federal character. Whether India is a federal country is a highly debated subject and replete with conflicting opinions. This situation is primarily because of the fact that nowhere in the Constitution of India, the word 'federal' or 'federalism' appears. India is defined as a 'sovereign socialist secular democratic republic', but not as federal.[41] Notwithstanding, two commissions

formed by the Government of India to look into the working of the Indian Constitution found that creative and cooperative federalism is the ethos and working model of the Indian polity. The Sarkaria Commission, set up on June 9, 1983, to review the working of the existing constitutional arrangements between the Union and the States, says, "The Constitution as it emerged from the Constituent Assembly in 1949, has important federal features but it cannot be called 'federal' in the classical sense…it is unitary in extraordinary situations, such as, war (or emergency) and federal in normal times. Some authorities have classified it as a "quasi-federal" Constitution."[42] The report further adds, "Avoiding a dogmatic approach, they [the framers of the Constitution] fashioned a sui generis system of two-tier polity in which the predominant strength of the Union is blended with the essence of co-operative federalism."[43]

On February 22, 2000, another commission called *National Commission to Review the Working of the Constitution* was set up to examine, among others, "as to how best the Constitution can respond to the changing needs of efficient, smooth and effective system of governance".[44] The report of the Commission identified the Concurrent List as the main source of a functional, cooperative and creative federalism that exist in India. It describes, "The framers of the Constitution recognised that there was a category of subjects of common interest which could not be allocated exclusively either to the States or the Union…[A] harmonious operation of the Concurrent List could well be considered to be creative federalism at its best."

Does it really matter if India is a federal country or not when it comes to climate action and governance? As a mode of governance, federalism is preferred as it is believed to improve policy outcomes, by promoting administrative decentralisation.[45] In his article entitled, "Ends of Federalism", Prof Martin Diamond attempts to answer a very pinpointed question: what do we want from federalism? Talking in the context of American federalism, he says that deliberative aspects of administrative decentralisation is as important as the execution aspect, to make federalism more decentralist and people-led. He adds, "…administrative decentralization could not be understood merely as the local execution of centrally made policy…there is both a policymaking (deliberative) and an executive aspect to administration (…) mere local execution of central policy (…) will not suffice. What interests the local man is the policy itself…and not just the execution of the policy (…)"[46]

In India, the states have framed their own policies, in particular the State Action Plans on Climate Change (SAPCCs) to tackle climate change and responsibilities to implement them too lies primarily with them. However, owing to a lack of contextually relevant and localised climate science and knowledge, the states found it difficult to base their SAPCCs on crude scientific understanding and data on climate change for their respective states. A study found that at the time of developing their own SAPCCs, most of the states lacked the requisite knowledge to give a proper policy response to the threats of climate change.[47] For instance, Karnataka's SAPCC pointed out that the inadequacy of knowledge on the impacts of climate change puts a limiting constraint on the SAPCC, which it expected to be resolved under National Mission on Strategic Knowledge for Climate Change (NMSKCC), one of the eight national missions of the NAPCC.[48] The States did not have a designated resource centre on climate knowledge prior to the making of their SAPCCs. In fact, most of them either established a knowledge centre on climate change to prepare the SAPCC or committed in their SAPCC to establish one to address cross-cutting concerns. A case in point is the Madhya Pradesh's SAPCC which said, "In order to impart knowledge to stakeholders, a State Knowledge Management Centre on Climate Change (SKMCCC) (…) is being established".[49]

The situation has begun to change with the central government making efforts to strengthen the capacity of the states by setting up strategic knowledge centres for climate change, including climate change labs. That will help produce relevant knowledge on

climate change which can be used by the states to frame an appropriate climate policy.[50] Karnataka became the first state to have established, with the Centre's help, the strategic knowledge centre for climate change and set up a climate change lab.[51] Under the NMSKCC, State Climate Change Cells have been set up in the 11 non-Himalayan states of India.[52][53] These Cells are mandated to "ensure a continuous updating of their SAPCCs".[54] The establishment of an adequate climate knowledge base at the state level would play a vital role in addressing cross-sectoral concerns, effecting trade-offs among various sectors and establishing synergies among them.

Against the above background of existing framework of international assistance, domestic institutional structure and prevailing governance, let us now ask how India fares when it comes to meeting its Paris commitments on climate actions, which "are largely financed from [its] domestic sources (…)"[59]? India's Minister of Power and New and Renewable Energy said in the G20 Energy and Climate Joint Ministerial Meeting held on 23 July 2021, that India remained 'committed to meeting its climate goals under the Paris Agreement' and 'is all set to exceed its NDC commitments before 2030'.[60] In his Independence Day speech on 15 August 2021, the Indian Prime Minister Narendra Modi proclaimed, "Today, India is the only country in the group of G-20 countries, which is moving fast towards achieving its climate goals".[61] What is the basis of such claims? India's NDC outlines eight targets in total, out of which five 'pertain to sustainable lifestyles; climate friendly growth path; climate change adaptation; climate finance; and technology and capacity building'.[62] The remaining three are quantifiable indicators which can be measured against the available data. The following table gives an overview of what was committed and what was planned under India's NDC.

India's three key NDC targets for the period 2021-2030

No.	Commitment	Progress
1	To reduce the emissions intensity of its GDP by 33 to 35 percent by 2030 from the 2005 level.	India has already achieved an emission reduction of 28% over 2005 levels; all set to exceed its NDC commitments before 2030.[55]
2	To achieve about 40 percent cumulative electric power installed capacity from non-fossil fuel based energy resources by 2030 with the help of transfer of technology and low cost international finance including from Green Climate Fund (GCF).	India already has achieved 38.5 percent installed capacity from renewables.[56]
3	To create an additional carbon sink of 2.5 to 3 billion tonnes of CO2 equivalent through additional forest and tree cover by 2030.	Latest data are not available to measure this, though India says it has made substantial progress. However, some reports suggest that on this front, India could not make much progress and is 'receding further from its target rather than improving'.[57] Experts believe that to achieve this target, India would need to double rate of forest cover expansion.[58]

Conclusion

Though India seems to be on track to achieve its Paris commitments, it needs to overhaul its domestic institutional structure, strengthen federal processes, promote innovation in climate technology and mobilize international support for climate finance and technology, especially for the adaptation action. As has been pointed out by the initial version of the NDC Synthesis Report that "much greater emission reduction efforts than those associated with the INDCs will be required in the period after 2025 and 2030 to hold the temperature rise below 2 °C above pre-industrial levels"[63], India an important player in global climate action is often urged to raise its climate ambition further to help meet the Paris goals. Recently, the US urged India to increase its climate ambition during India-US Climate Action and Finance Mobilization Dialogue launched on 13 September 2021.[64] Given the developmental gains as co-benefits of the climate action, it would be in India's long term interest to consider raising its climate ambitions.

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Daniel Seiberling

The Hanns Seidel Foundation's Regional Sustainability Network (RSN)

The Regional Sustainability Network (RSN) is an initiative developed in 2018 to provide a platform for region-wide dialogue for partners active in the climate field from different Hanns Seidel Foundation's project countries of the Sub-Saharan Africa division. Africa is the continent that is particularly affected and vulnerable to climate change, without having caused it in this form through its energy consumption and its relatively low emissions of CO2.

Keywords:
Sub-Sahara Africa - Kenya - Regional Sustainability Network - RSN - civil society - common but differentiated responsibilities and respective capacities - Nationally Determined Contributions - NDCs

The Hanns Seidel Foundation's Regional Sustainability Network (RSN)

|| Daniel Seiberling

The Regional Sustainability Network (RSN)[1] is an initiative developed in 2018 to provide a platform for region-wide dialogue for partners active in the climate field from different HSF project countries of the Sub-Saharan Africa Unit. Africa is the continent that is particularly affected and vulnerable to climate change, without having caused it in this form through its energy consumption and its relatively low emissions of CO2.

As early as 1992, the UNFCCC treaty stated: "... the global nature of climate change requires the widest possible cooperation of all countries and their participation in an effective and appropriate international response, consistent with their common but differentiated responsibilities and respective capabilities, as well as their social and economic situations."

The principle of "common but differentiated responsibilities and respective capacities" (CBDR-RC) is still the basis on which industrialised nations of the Global North can enter into a qualified and adequate dialogue with countries of the Global South and agree on and coordinate concrete measures within their respective capacities.

Sub-Saharan Africa, or Africa, has traditionally been a focus of Hanns Seidel Foundation's (HSF) International Cooperation with currently 11 project offices and project activities in 15 countries. The region, with its highly complex ecosystems and unique biodiversity, is experiencing the effects of current climate change in a dramatic way. Heat and drought, locust infestations and weather extremes have always been a natural reality in many African countries. For some years now, however, natural disasters have been multiplying and intensifying with devastating consequences that not only endanger the further development of the region, but also threaten the very existence of what has been achieved.

The Regional Sustainability Network (RSN) uses the access that the HSF project work has created in other sectors to make the complexity of climate change visible and to achieve a better position in terms of policy, engagement, capacity and dialogue to address climate change in Africa. Members of this network are organisations working in the fields of climate change, environmental sustainability and in the energy sector on the African continent. Members use RSN as a platform for extended dialogue, knowledge sharing, mutual learning and working together to develop solutions. Members have taken an active part in national discussions on climate action such as low-carbon growth, smart technologies, renewable energy, green agriculture and climate smart agriculture. In the UNFCCC process, the

Nine countries in sub-Saharan Africa are currently represented in the Regional Sustainability Network:

Kenya	Sitz des Netzwerks (HSF)
	(North Rift Valley Economic Block, NOREB)
Ethiopia	(Environment and Climate research Centre, ECRC)
Democratic Republic of the Congo	(Centre d`appui au development integral, CADIM)
Djibouti	(SOS Environment)
Ghana	(Centre for Ecological agriculture and livelihood, CEAL)
Namibia	(Desert Research Foundation)
South Africa	(Champions of the Environment Foundation)
Tanzania	(Climate Action Network Tanzania, CAN TZ)
Togo	(Urbis Foundation)

network has worked with members to organise regional pre-conferences of Parties and support members to participate in conferences such as the COP and UNEA.

In the future, one of the Network's tasks will be to help ensure that the ambitious targets of Nationally Determined Contributions (NDCs) are actually integrated into national climate plans and that their financing and implementation are guaranteed. The necessary capacity building of member organisations is an important component of further support by the HSS. The strength of the network lies in the fact that a large number of personal and institutional contacts can be incorporated, thus also enabling global learning. Last but not least, the network allows the special concerns of women, youth and vulnerable groups to be kept in focus when implementing the climate protection goals.

The Nationally Determined Contributions (NDCs) are of fundamental importance for the participation of civil society in the national climate process. These contributions are binding, national climate target agreements that are published and enforceable and thus provide civil society with the necessary resilient argumentation basis for engagement at the national level.[2] Four of the countries represented in the RSN have submitted new, updated NDCs for 2021.

On the following pages, Sixbert Mwanga, Director of the Climate Action Network CAN Tanzania, gives an overview of the importance of civil society organisations for achieving the goals of the United Nations Framework Convention on Climate Change (UNFCCC-Paris Agreement) and the Sustainable Development Goals SDGs, using Tanzania as an example.

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NOTES

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Sixbert Mwanga

The Role of Civil Society Organizations and Networks in Advancing and Achieving the Paris Agreement and Sustainable Development Goals: Perspectives from Tanzania

This paper provides an overview of the role played by CSOs in Tanzania to advance and achieve the United Nation Framework Convention on Climate Change (UNFCCC-Paris Agreement) and SDGs targets. The analysis concentrates on climate challenges Tanzania faces, initiatives taken, available climate change frameworks and the role of CSOs in the development and review of National Determined Contribution (NDC) and other national climate change plans and regular reviews that intend to meet UNFCCC and SDG targets at the country level. It also provides an overview on how both CSOs and related networks could contribute to strategies that could lead into mainstreaming and implementation of UNFCCC and SDG targets at sub-national and community levels.

Keywords:
Sub-Sahara Africa - Tanzania - National Determined Contributions (NDC) - inclusive economic growth - Voluntary National Reviews (VNR) - climate change mitigation - civil society participation - Regional Sustainability Network (RSN) - National Development Vision 2025 - National Climate Change Response Strategy (NCCRS)

The Role of Civil Society Organizations and Networks in Advancing and Achieving the Paris Agreement and Sustainable Development Goals: Perspectives from Tanzania

|| Sixbert Mwanga

1. Introduction

The economies of many developing countries and especially those in Sub-Saharan Africa have remained highly dependent on climate sensitive sectors such as subsistence agriculture, energy, fishing, forestry, transport and ecosystem services. These sectors are highly affected by adverse impacts of climate change. The capacities of these countries to build and strengthen resilient economies, while achieving sustainable development goals supported by the abovementioned sectors has been decreasing in recent years. Due to poverty, high dependence on rainfed livelihoods, and ever-increasing extreme climate and weather events, communities are exposed to climate change risks and are becoming more vulnerable. This situation also limits countries to prepare and mainstream climate change issues into their development plans and if done, the process is partially with limited ambitions concerning both mitigation and adaptation targets. As a matter of fact, many developing countries highly depend on developed countries and/or global financial and technical supports to deliver their national climate change agenda. Provision of needed financial resources and transferring green technologies from the developed countries to meet both climate targets and SDGs in developing countries has not yet been achieved and the process has remained slow and in piecemeals.[1] There has been an endless call for developed countries to do more and of more importance in an integral process that brings climate actions and sustainable development together. This has led to united (in developing and developed countries) voices from Civil Society Organisations (CSOs) for developed countries to show leadership and be accountable on cutting greenhouse gas emissions by increasing ambitious mitigation targets and providing required financial and technical resources to support adaptation in developing countries. Influenced by CSOs, developing countries, on the other hand, are asked to contribute both to climate mitigation targets and to address poverty in a sustainable and transparent manner.

Since 2015, when both the Paris Agreement (PA) and the Sustainable Development Goals (SDGs) were launched, Sub Saharan countries have received financial support and worked to contribute on limiting the average global warming to 2°C and where possible to 1.5°C, while achieving sustainable development. However, climate change related impacts, limited capacities and technological resources have continued to challenge these efforts. Most of the supported initiatives lack sustainability and collapse soon after support

from donors comes to an end. This could be linked to the mode of the initiative design – not integrated to day-to-day programmes, lack of community and CSO-participation to increase ownership as well as bureaucracy posed by governments. These are also factors limiting the monitoring and reporting processes.

On the other hand, prolonged droughts, floods and sea level rise have had extended impacts on livelihood sectors, human health, ecosystems and related services especially in rural areas. These have shifted focus several times from an emphasis on climate actions and green economic growth to attending human related emergencies. Climate and weather extreme events have increased in the region in terms of intensity and frequencies. In Tanzania, this situation has increased demands from both CSOs and community for the government to take more ambitious steps in helping to address both emission and to build a climate resilient society. Additionally, CSOs have emphasised that the processes and steps to build a climate resilient society should be inclusive and participatory in nature to ensure ownership on the development and implementation parts, especially during the challenging times of COVID-19.[2] This is very important if stakeholders, including government and policy makers, are to feel pressure and take informed decisions that contribute to achieving climate resilience and sustainable development. Following the same logic, all nations should work together to reduce greenhouse gas while strengthening the ability to adapt to the impacts of climate change and to build resilience societies. However, at a point where countries supposed to lead are failing to take the required steps, individual countries, especially those in the developing group, must grasp the opportunity to show leadership. This is crucial, as developing countries are the most affected and vulnerable to the impacts of climate change.

This paper provides an overview of the role played by CSOs in Tanzania to advance and achieve the United Nation Framework Convention on Climate Change (UNFCCC-Paris Agreement) and SDGs targets. The analysis concentrates on climate challenges Tanzania faces, initiatives taken, available climate change frameworks and the role of CSOs in the development and review of National Determined Contribution (NDC) and other national climate change plans and regular reviews that intend to meet UNFCCC and SDG targets at the country level. It also provides an overview on how both CSOs and related networks could contribute to strategies that could lead into mainstreaming and implementation of UNFCCC and SDG targets at sub-national and community levels.

2. The climate change situation in Tanzania

Like other countries in the Sub-Saharan region, the livelihoods of the majority (75 percent of the population) of people in Tanzania depend on climate sensitive sectors. However, these are the sectors that are mostly affected by the impacts of climate change. Recent years have witnessed increasingly extreme climate and weather events whereby the mainland faces prolonged droughts and floods, while the sea level rise results in salt water intrusion on the coastal and island areas including Zanzibar. These have major economic costs, are disrupting community livelihoods and slowing down national long-term plans for growth.[3] The current vulnerability status and projected climate change impacts are significant enough to hinder the country from building climate resilience, poverty reduction and inclusive economic growth[4]. The economic impacts of climate change are currently projected to be higher and affect national financial plans. The cost of building adaptive capacity and enhancing resilience in Tanzania is estimated at US$ 150 million annually, and if no steps are taken could cost up to 2 percent of the country's GDP each year by 2030.[5] Additionally, the cost for successful implementation of the NDC targets is estimated at US$ 19.2 billion. If Tanzania has to support and reduce current sector and livelihood vulnerabilities using 100 percent renewables, the annual investment costs could amount to USD 9 billion per year[6].

Sectors that are projected to be most affected by the impacts of climate change include agriculture, energy, water, fisheries, transport, tourism, livestock and forestry. These are the sectors that play an important role in supporting the country´s economic growth. For instance, agriculture alone contributes up to 28 percent of Tanzanian GDP and supports food security and livelihoods of about 85 percent of Tanzanians. However, the agricultural sector in Tanzania faces land degradation, limited financial resources and poor use of appropriate technologies. Studies have also indicated that the water and energy sectors are playing a great role in promoting sustainable socio-economic growth. However, they are among the sectors that are facing severe challenges from climate change. It is therefore important for countries like Tanzania to pay close attention and to integrate climate change issues in all development considerations both in urban and rural areas.

3. Relevant national policies and frameworks

Tanzania is among the most vulnerable countries concerning the impacts of climate change, but is also a party to the UNFCCC, the Paris Agreement and the SDGs. Tanzania ratified the UNFCCC in 1996 and the PA in 2018. Tanzania also took part in the SDG process and has worked to integrate associated goals and targets in its development plans and strategies such as the Five-Year Development Plans II and III. Tanzania is also taking part in the Voluntary National Reviews (VNRs) and has been participating in the High-Level Political Forums. Tanzania has put in place several national policies and legal instruments that are pertinent in addressing climate change issues. At the national level, the Vice President's Office, Division of Environment, is the focal point to the UNFCCC and coordinates both environment and climate change issues. Specific issues related to climate change are coordinated by the National Climate Change Steering Committee (NCCSC,) composed by permanent secretaries from other sector ministries and the National Climate Change Technical Committee (NCCTC). The NCCSC is responsible for analysis, providing policy guidance and coordinating climate change activities across sectors, whereby the NCCTC is responsible for providing technical advice to the national climate change focal point.

3.1 Existing Climate Change Policies and Frameworks

Since the late 1990s, all policies in Tanzania are developed to contribute to the realization of the National Development Vision 2025, which guides economic and social development efforts up to the year 2025. The vision is operationalized through several plans and strategies including the national five-year development plans (FYDP) 2021/22-2025/26, coordinated by the Ministry of Finance and Planning. Having noticed that the adverse impacts of climate change have continued to undo achieved development measures and threaten the development vision, the government has put in place several relevant policies and strategies. Selected key documents include the National Adaptation Programme of Action (NAPA 2007), Environmental Management Act (EMA 2004), National Energy Policy (NEP 2015), Tanzania's SE4ALL Action Agenda (2015), Tanzania Agriculture Climate Resilience Plan, 2014–2019, National REDD+ Strategy and Action Plan (2013). The current key documents include the National Five-Year Development Plan III (FYDP 2021/22-2025/26), National Climate Change Response Strategy (2021) and National Determined Contribution (NDC 2021). The three current climate related strategies and priority sectors are discussed below.

3.1.1 Tanzania National Development Plan-FYDP III (2021/22- 2025/26)

The FYDP III sees climate change as a threat to community livelihoods and the national economy. Therefore, it emphasizes to strengthen adaptation and building resilience to climate change while reducing and/or removing greenhouse gas emissions, especially by embarking on utilising renewable energy sources to address energy poverty[7] and promoting clean cooking stoves. There is also

emphasis on mainstreaming measures to combat climate change into development plans and strategies. Meeting the Paris Agreement and the SDGs as a way to meet national development goals has been given special emphasis. More importantly, the plan calls for government, private sector and civil society organisations to get accreditations and build capacities to secure and increase contribution from climate finance mechanisms. There is a plan to mobilise at least US$ 304 million from climate change funds to support the plan. The government sees CSOs playing an important role in spearheading access to climate finance.

In the FYDP III, key priority sectors considered to be vulnerable to and important for mitigating climate change include: food security and nutrition, clean and affordable energy, sustainable water, industrialisation and services, forestry as well as land use management. There is also a call to address climate change related loss and damages especially due to ever increasing natural disasters. Discussions with civil society organisations confirm that the integration of climate change into the FYDP III was due to long term advocacy done by civil society in previous years.

During the development of the FYDP, civil society organisations working to address climate change, environmental issues and socio-economic transformation have been partly consulted during the development of the FYDP III, making it participatory and inclusive. However, the participation did not come automatically as civil society organisations had to lobby for the opportunity at their own cost. This confirms that the government did not set aside resources to support the participation of civil society organisations, which may be regarded as excluding public inputs into the FYDP III. Previous experiences show that limited participation of public, private sector and civil society organisations adversely affected the implementation of the produced national plans and strategies.

3.1.2 National Climate Change Response Strategy - NCCRS (2021)

The overall objective of the NCCRS is to support and enhance national resilience to the adverse impacts of climate change and to enable the country to pursue low carbon development pathways so as to achieve sustainable development. The strategy has identified and prioritised fourteen sectors that need special attention and enhanced interventions. These sectors are freshwater resources, coastal and marine environments, forest and bee keeping, wildlife, agriculture crop sub sector, human health, tourism, livestock, fisheries, infrastructure, human settlements, energy, industry and land use. The mitigation part of the strategy has identified and prioritised six sectors. These sectors are energy, forest and mangroves, industry, transport, waste management and livestock. The strategy also has identified and prioritised five issues under cross cutting issues. These issues include climate financing, gender mainstreaming, research, vulnerability assessment, systematic observation and impacts monitoring, technology development and transfers, as well as capacity building, education and awareness. The indicative total budget to achieve adaptation, mitigation and cross cutting targets is around US$ 250 million. Whereby adaptation alone requires US$ 110 million, both mitigation and cross cutting issues require US$ 75 million and US$ 24 million respectively. Responsible institutions from government, private sector and civil society organisations are invited to take part in the realisation of the strategy targets. During the formulation and development of the NCCRS, sectoral, private sector and civil society organisations were consulted. Due to the COVID-19 outbreak, both physical and virtual meetings were held. Civil society organisations´ networks such as Climate Action Network Tanzania (CAN TZ) led a process to mobilise resources to ensure coordinated participation of stakeholders, especially from civil society.

3.1.3 National Determined Contribution (NDC 2021)

The development of Tanzanian the NDC is a response to Article 4 of the Paris Agreement, which establishes a long-term framework of actions contributing to global greenhouse gas emission reduction efforts[8]. The process to develop this NDC started in 2019 but was slowed down by the COVID-19 pandemic. This NDC builds on and is linked to the National Climate Change Response Strategy (2021), the Zanzibar Climate Change Strategy (2014), and other national climate change strategies and national development agendas and priorities. Under this NDC, the country intends to enhance long-term climate resilience of social and ecosystems, reduce climate change vulnerability and related risks, enhance climate change mitigation actions and ensure sustainable development.[9] To achieve these targets, the government should mainstream climate change issues into development planning at all levels and pursue adaptation and mitigation measures as outlined in this NDC. Key priority sectors under adaptation are agriculture, forestry, energy, water, livestock, coastal, marine environment and fisheries, tourism, human health, wildlife, infrastructure and disaster risk reduction. Other sectors under both adaptation and cross cutting issues include gender mainstreaming, capacity building, research and systematic observation and technology development and transfer. Under mitigation contributions, Tanzania has prioritised four sectors due to their significant potential in greenhouse gas emissions reduction. These four mitigation sectors are energy, transport, forestry, and waste. The realisation of mitigation targets depends on international support both on climate finance and access to relevant technologies. For the energy and

Table 1: Summary of mitigation actions in the Tanzanian NDC

Element	Information
Type	Emissions reduction as a percentage reduction from a BAU scenario.
Reduction level	30-35 percent reduction on national BAU emissions by 2030
Sectors	Economy-wide reductions, prioritising actions in energy, transport, forestry, and waste management sectors.
Coverage	Mainland Tanzania and Zanzibar
Greenhouse gases (GHG)	The NDC includes the following GHG: • Carbon dioxide (CO_2) • Methane (CH_4) • Nitrous oxide (N_2O)
Reference year	2014
Timeframe	By 2030
Estimated quantified impact on GHG emissions	Low ambition scenario, 30 percent reduction, would result in approximately 138 Million tons of carbon dioxide equivalent (MtCO2e) reduction from the BAU scenario by 2030. High ambition scenario, 35 percent reduction, would result in approximately 153 Million tons of carbon dioxide equivalent (MtCO2e) reduction from the BAU scenario by 2030.
Intention to use market- and non-market-based mechanisms to meet contribution	There is huge potential for market and non-market-based mechanisms that can contribute to significant reduction in Greenhouse gases emissions. The projects can be developed and implemented as Nationally Appropriate Mitigation Actions (NAMAs), Reducing Emissions from Deforestation and Forest Degradation (REDD+) and Clean Development Mechanism (CDM) especially in the areas of renewable energy and energy efficiency, forestry, transport and waste management.
Metrics and methodology	Tanzania used the IPCC 2006 Guidelines, the 100-year Global Warming Potentials (GWPs) and considering country circumstances.

Source: URT, 2021

transport sector, there is emphasis on promoting clean technologies in power generation and use of diverse renewable sources such as geothermal, wind, solar and bioenergy to support energy access and transportation systems. Tanzania commits to reduce greenhouse gas emissions economy-wide between 30-35 percent (table 1) relative to the Business-As-Usual (BAU) scenario by 2030. This is a very ambitious commitment in the East Africa region. Kenya´s NDC commits to reduce 32 percent of greenhouse gases relative to a BAU scenario by 2030. Such a high commitment by Tanzania was not easily achieved. Here it is important to emphasise the role played by civil society organizations such as CAN TZ and other development partners for continued support to raise ambitions. Even if the outbreak of the COVID-19 pandemic was a challenge in terms of shrinking space for civil society organisations, there were dedicated efforts from civil society organisations to engage the government and contribute on the revised NDC. Of course, there was not much space for engaging in the process and the participation of civil society became meaningful only after it had secured external resources to support the process and after dedicating time to provide required data to support the process. After March 2021, there was more openness from government and stakeholders that led to the accomplishment and submission of Tanzania´s NDC in July 2021.

3.2 The role and contributions of CSOs and their networks in the development and implementation of the climate change strategy and NDC

In many countries, civil society assumes an important role in fast tracking the development and implementation of both the Paris Agreement and the SDGs targets. Civil society has done even more in countries where space and environment allow. Of late, in many African countries and East Africa in particular, the operating space for civil society has been shrinking and interfered with by a changing political landscape. Still, the role of civil society remains to support and to speak out on behalf of the vulnerable and people who have no political and financial capacity to influence changes and address the impact of climate change.

Despite the COVID-19 pandemic, the year 2021 seems to become a “climate year” for Tanzania. So far, several climate change and sustainable development plans and documents have been finalized. These documents include the NDC, NCCRS and FYDPIII. During the development of NDC, NCCRS and FYDPIII, civil society organisations and their networks played an important role from mobilizing resources and supporting the process to ensuring inclusive participation and providing technical support. However, during discussions with some selected civil society representatives it has been mentioned that the process to engage and make significant contribution lacked formal structure. The participation was more determined by the government and in most cases only strong civil society organisations close to the government were given the opportunity. This could mean that not all voices were represented in the process.

The other role played by the civil society was to make sure that the updated NDC has progressive targets to make a significant contribution to the Paris Agreement. A good example was rising the target to reduce greenhouse gas emissions economy-wide by 2030 from 10-20 percent as proposed in the first NDC, to up to 30-35 percent in the revised one, which came after long discussion, thanks to the Minister responsible for Environment and Union matters.

It was also noted during the process that some of the selected participants –from both government and civil society – had limited understanding of the processes and current global scientific findings. To address this, CAN TZ had to reorganise and offer some awareness trainings before some events to ensure that participants could make meaningful contributions to the process. Other series of capacity building were dedicated to journalists, youth and women groups who were new to the process. It was the responsibility of civil society to make sure

the developed plans and strategies were informed by scientific evidence and that the narratives were well framed. Civil society also played an important role in downscaling and customizing international agreements and policy processes to the national context. To increase pressure and ensure timely submission of the NDC to UNFCCC, civil society organisations had to organize and engage development partners and the East African Community secretariat. In May 2021, CAN TZ conducted a two-days stakeholders' workshop at the East Africa Community headquarters in Arusha, Tanzania. The meeting was attended by government, media and civil society representatives from all six member states. They were able to present their processes and current status of the NDCs and to discuss how they could raise climate ambitions and ensure timely submission. Media representatives were trained in how to formulate strong questions to policy and decision makers on ambitious NDCs and timely submission.

After the development and submission of the NDC, the role of civil society organizations remains to support resource mobilisation and to ensure inclusive implementation both during and post COVID-19 recovery. To achieve both the PA and SDGs, decentralized renewable energy services remain at the top of the list on the civil society agenda. It is considered to address energy poverty, boost country and rural economy and, at the same time, ensure environmental sustainability and a better COVID-19 recovery. Civil society organisations need to continue advocating for government and development partners to put in place technical and financial resources to ensure resilient and low carbon growth plans. This will include providing technical support, ensuring transparency, implementing pilot projects as well as developing means and systems for reviewing, monitoring and reporting implementation. Civil Society Organisations and their networks need to remain focused on working with the government to develop a transparent and well-structured engagement process that will ensure true representation and/or participation of local communities and the public at large in the implementation of NDC and SDG targets[10]. To achieve this, there should be another engagement to build common understanding and consensus on how to mainstream and downscale targets from NDC, NCCRS and NFYD III to sub national and community levels.

3.2 The role of development partners and the private sector in the implementation of NDCs and SDGs

The development of ambitious NDCs and SDG targets at the national level is one thing but the challenging part is to make sure that the targets are financed and implemented to enhance climate resilience, reduce greenhouse gas emissions and ensuring inclusive participation and sustainable development at the community level. As of April 2021, the government of Tanzania has opened more doors and calls upon all stakeholders to participate effectively in implementing the commitments to meet targets for both the Paris Agreement and the SDGs. Based on the current political landscape in Tanzania, development partners and the private sector should seize the opportunity to contribute in the realisation of these targets. It is clear that Tanzania alone cannot meet the proposed climate targets and combat climate change. Developing and promoting a low carbon society remains a global duty[11],guided by the concepts of the polluter-pays principle and Common but Differentiated Responsibilities which bring into account the historical relationship between industrialization in the global north and climate change.

It is clear that the adverse impacts of climate change pose risks to the economy and the people in many African countries and can systematically affect regional economies and financial flows. The private sector and banks, especially those in industrialised countries, have a great role to play in providing finance to support climate actions and addressing related challenges in countries like Tanzania. It is equally important for the government of Tanzania to create and maintain political will in addressing climate change, to integrate a

focus on climate in all development sectors and to ensure uptake and commitments to scale up low carbon trajectories. These should build confidence and ensure investment security to stakeholders and the private sector to take part in the process. This also will require civil society organisations, trade unions, academic institutions and churches (in Tanzania at least) to continue engaging government, banks and private sector to provide financial resources and relevant technologies needed for climate actions and sustainable development. The CSOs have to take more assignments to ensure COVID-19 recovery plans are well linked to sustainable development and embrace a resilient economy. It is argued that the COVID19 pandemic should not shift the government's focus to health issues alone, but that the recovery process should be an integral part of climate action and sustainable development. Efforts to integrate and promote an inclusive and green recovery from the COVID-19 pandemic should lead to a resilient and low carbon society.

3.3 The Contribution of the Regional Sustainability Network to the implementation of both UNFCCC and SDG goals

The development of many Sub-Saharan African countries depends on climate sensitive sectors and the livelihood of a majority of the people is dwindling due to adverse impacts of climate change. This situation has forced governments and stakeholders to take deliberate efforts important to strengthen adaptation, building capacity and control greenhouse gas emissions. To achieve this, well organized and coordinated efforts especially among civil society are required. The Regional Sustainability Network (RSN) was born in 2018 and is funded by the Hanns Seidel Foundation (HSF). In recognition of Africa's particular vulnerability and risks caused by climate change, RSN aims to make the complexities of climate change more visible and to facilitate better preparation in terms of policy, engagement, capacity and dialogue to address climate change in Africa. Members of this Network include organizations working in the area of climate change, environmental sustainability as well as energy on the African continent. Members use the RSN as a platform for intensive dialogue, exchanging knowledge, mutual learning and to work towards formulating solutions in a collaborative and inclusive manner. Hosted by the HSF Kenya office in Nairobi, RSN has members in nine countries in Sub-Saharan Africa: Democratic Republic of Congo, Djibouti, Ethiopia, Ghana, Kenya, Namibia, South Africa, Tanzania, Togo.

Since its formation, the RSN has played role of a spearheading and coordination unit needed to address climate change in the region. Members have continued to plan and work together on both UNFCCC and SDGs goals. The Network has opened doors to members to access and engage with international and regional organisations such UNEP, the African Forest Forum and UNDP. Under RSN leadership, governments from member countries are also participating in updating on plans and progress made to achieve UNFCCC and SDG goals. Through the Network, member organisations are now aware on how they can engage their governments and stakeholders to strengthen adaptation, build resilience and to make significant contributions to global greenhouses gas reduction. In the last two years, RSN has provided support to its members to champion and catalyse national discussions on climate actions including low carbon growth, smart technologies, renewable energy, environmentally friendly and climate smart agriculture. Within the UNFCCC process, the Network has worked with members to organize a regional pre-Conference of the Parties (COP) and support some members to attend the COP so that they can raise national voices – especially those of vulnerable groups – and engage the negotiators to deliver as required.

By the end of August 2021, only four out of nine RSN member countries, had submitted their updated NDCs (Kenya, Tanzania, Namibia and Ethiopia). The remaining five countries (Democratic Republic of Congo, South Africa, Djibouti, Togo and Ghana) were still working on revising and updating their NDCs. Those who have managed to submit their NDCs have

increased their ambition compared to their Intended Nationally Determined Contributions (INDCs) and vow to strengthen both adaptation and mitigation measures.

All NDCs have identified adaptation and mitigation targets as well as cross cutting issues as briefly presented below:

Ethiopia

Ethiopia´s updated NDC commits to reducing economy-wide greenhouse gas emissions by 220.9 Mt CO2 eq. in 2030 as compared to 2010 the BAU scenario. The previous NDC had intended to limit its net greenhouse gas emissions to 145 Mt CO2 eq. or lower by 2030[12]. Compared to the first NDC, which would have required US$ 150 to meet mitigation targets, the updated NDC will require US$ 281 billion to meet mitigation targets[13]. Energy and livestock are considered important factors in reducing emissions in Ethiopia. Compared to the first NDC, the quantitative emission reduction target is lower in the updated NDC. Still, Ethiopia has argued that its updated NDC has more robust greenhouse emission pathways. The reasons given include: clear demarcation between unconditional (20 percent- meaningful domestic resources) and conditional (80 percent), commitment to explore and increase ambition during the NDC period, and improved ability to track mitigation actions with a better Monitoring, Reporting and Verification system.

Ethiopia's updated NDC also seeks to undertake adaptation actions to reduce vulnerability of the people and the environment while ensuring a resilient economic development pathway. To achieve adaptation targets, 45 interventions and indicators have been identified. The required financial resources to meet the identified interventions under adaptation and mitigation amount to US$ 13.4 billion and US$ 281.3 billion respectively. Total required financial resources are US$ 294.7 billion, which makes the country's updated NDC the most expensive among the four countries (Kenya, Tanzania, Ethiopia and Namibia), whereby the government of Ethiopia has committed US$ 58.9 billion from domestic sources and required additional US$ 235.8 from international support.

Kenya

The updated NDC outlines contributions for both mitigation and adaptation. Compared to the first NDC which intended to reduce 30 percent of greenhouse gas emissions by 2030, the updated NDC seeks to reduce 32 percent of emissions relative to the BAU scenario of 143 MtCO2 eq.[14]. The country plan includes increasing renewable energy in the electricity generation mix in the grid, ensuring sustainable waste management systems and embracing low carbon and efficient transport systems. Adaptation remains a high priority to Kenya and the NDC intends to achieve a climate resilient society through mainstreaming climate change adaptation into the Vision 2030 medium-term plans – country integrated development plans –, and implementing sound adaptation actions. The total costs of implementing mitigation and adaptation actions in the updated NDC is estimated at US$ 62 billion. Compared to the first NDC which required 100 percent external support, the updated NDC is 13 percent domestically funded and requires 87 percent international support.

Namibia

Namibia's NDC commits to improve adaptation and to build a climate resilient society and economy. Agriculture, tourism and fisheries are considered important sectors for adaptation actions, whereby agriculture alone accounts for 26 percent. On mitigation, the country has increased ambitions to reduce emissions from 89 percent to 91 percent by 2030[15]. This target is slightly progressive above Namibia's INDC commitment. The projected cost of implementing the updated NDC is US$ 3.61 billion (on mitigation) by 2030 plus an additional US$ 1.71 billion to be spent on adaptation targets. Out of the total, the unconditional measures represent about 10 percent of the total expected funding. The funding pool would constitute a mix of national and international funding.

Tanzania
Compared to the first NDC, which set to reduce economy-wide greenhouse gas emissions between 10-20 percent by 2030[16], the updated NDC seeks to reduce economy-wide emissions between 30-35 percent relative to the BAU scenario by 2030, consistent with sustainable development agenda. The estimated cost for implementing the first NDC was US$ 61 billion, whereby the updated NDC requires a total of US$ 19.23 billion. It is however not clear yet what proportion of the total funds will come from domestic sources and how much international support will be needed.

In summary, concerning mitigation targets, renewable energy and other clean energy sources and technologies have been identified and given priority by all countries. In all countries the needed finance to support adaptation, mitigation and capacity building amount to billions of US Dollars. With limited financial capacity, as the COVID-19 pandemic has increased vulnerabilities and affected the economies of most of African countries, the call for international support in terms of funding and technology development and transfer to meet the NDC targets have been clearly put forward by all countries. The likelihood to achieve the set targets depends on how countries have linked their NDCs, are prepared to mainstream them into national sustainable development plans and whether they receive international support.

The next steps will be to support members in engaging their governments to submit their ambitious NDCs timely and, more importantly to make sure that NDC and SDG targets are mainstreamed into national short-and long-term plans to ensure financing and implementation. Strategizing and engaging global community to provide required resources and technologies remain important tasks of the RSN. The Network should also extend its terms of reference to include building capacities of its members to play a role in mobilizing global climate finance and engaging private sector and financial institutions to provide needed resources for achieving the intended goals. It is important to make sure that women, youth and other vulnerable groups who are often marginalised are a given special attention during the implementation of both the PA and SDG targets.

4. Conclusion

The outbreak of the COVID-19 pandemic has considerably slowed down efforts and shifted the focus from advancing on UNFCCC and SDGs targets at the required pace in favour of health issues. However, Civil Society Organisations in the Sub-Saharan region and in Tanzania in particular continued to push and demand for climate actions and green recoveries. Despite the slow pace and resource scarcity as well as a tough working environment, civil society worked hard in terms of providing technical support and ensuring timely submission of ambitious NDCs to the UNFCCC as required. In countries where the process has not been completed, CSOs are engaging their governments to deliver without further delays, targeting the COP26. It should be noted that both in the development and implementation of UNFCCC and SDGs targets, the role of Civil Society Organisations and the media remains crucial.

As a recommendation, Tanzania and other Sub-Saharan African countries who have completed and submitted their NDCs, Civil Society Organisations should use these promising opportunities for engaging governments to ensure mainstreaming and implementation of the targets at the sub-national and community level. During the whole process, efforts should be made to make sure the implementation will be more inclusive and country driven through enhanced engagement of youths, women, civil society in general but also the private sector.

|| **Sixbert Mwanga**

Sixbert Mwanga is the Executive Director of Climate Action Network (CAN) Tanzania. CAN Tanzania is an NGO which works with government ministries, other NGOs/Civil Society, Media and Research Institutions in the fields of Climate Change, Poverty Reduction, and Renewable Ener-

gy. CAN Tanzania, does advocacy at national and local levels and also works to realise international agendas such as the Sustainable Development Goals and the Paris Agreement on Climate Change at the national level.

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Interview with Bernadette Shalumbu-Shivute, Jonathan Kamwi and Clemens von Doderer, by Barbara Kahatjipara

Ahead of the COP26: Namibias fight for climate-change mitigation and adaptation

Namibia is severely affected by climate change. Since the country has huge potential for renewable energies such as solar energy, there are opportunities for a sustainable, “green” growth, also in the context of post-COVID recovery, that the government is aiming to exploit. In its Nationally Determined Contribution (NDC), delivered at the COP26, the country declares to reducing its greenhouse gas emissions by 91 percent by 2030.
The Hanns Seidel Foundation (HSF), with its office in Windhoek, is engaged in the field of environmental sustainability. HSF is working at the governmental, as well as at community level, to increase awareness about environmental issues, and promotes efforts to tackle the causes and consequences of climate change.

Keywords:
Climate change - Namibia - mitigation - adaptation - COP26 - National Determined Contributions - GHG Reduction - green growth

Ahead of the COP26: Namibias fight for climate change mitigation and adaptation

|| Interview with Bernadette Shalumbu-Shivute,
Jonathan Kamwi and Clemens von Doderer

Barbara Kahatjipara/ HSF: *Environmental sustainability is one field of activity of the Hanns-Seidel-Foundation in Namibia. Since the Namibian economy is so highly dependent on natural resources like diverse rangelands and ecosystems, the economic and social development is negatively affected by climate change. As a start, could you give us some insights on how Namibia is threatened by climate change?*

Dr Clemens von Doderer: To begin with, Namibia is actually one of the driest countries in sub-Saharan Africa, if not the entire continent or even globally. And because of that, any long term temperature increase is obviously also negatively affecting Namibia. Two years ago, we had the worst drought in 90 years, and the effects were tremendous, especially if you look at the agricultural sector. Many commercial and subsistence farmers had to sell off their livestock, particularly cattle, to reduce the number of heads they had on their farms so that they could sustain the numbers they had left. And that obviously had an impact economically. Obviously, not only livestock production was affected, but also other production types in the agricultural sector suffered. Especially the communities in the Northern part of the country, who mainly live off subsistence farming, were severely affected. Particularly the vulnerable poor had to resort to alternative ways of producing food or were forced to access food programs of the Namibian government or other ways to sustain their livelihoods. Looking at the long term trend, we already see the impact of climate change very much being a reality. Not only because of the changing climate itself, but also because of an increased pressure on natural resources. Namibia has lost, for instance, approx. 25 per cent of its forest cover since 1990. That used to be 8.8 million hectares or close to 11 percent of Namibia's land mass. In 2020 forests make up only 6.6 million hectares or about 8 percent of Namibia's land mass. This is due to an increased demand for timber, land for agricultural production or veld fires, among other reasons. However, forests are key for the survival of the people: where there are forests, there is rain. And in Namibia, which is highly depending on rain as a source for any kind of activity – agricultural, forestry, whatever the case might be – a lack of water is really threatening the livelihoods of people.

HSF: *Thank you very much for that. It does paint a dire picture of what climate change does to Namibia: how it threatens the very livelihood, not only of people but of livestock, and how people have to resort to the most desperate measures.*
For that reason, I'd like to direct this question to Bernadette of the Ministry of Environment, Forestry and Tourism: Ahead of COP26, what

are being Namibia's most important achievements? And, also as a follow up question: What is it that the Namibian delegation will be expecting at COP26 from industrialized nations?

Bernadette Shalumbu-Shivute: So in terms of our achievements, the most important one is that we have updated our Nationally Determined Contributions (NDC). This is the blueprint of how Namibia intends to cut its greenhouse gas emissions all the way to 2030. This was a prerequisite that before the next COP, this document should be in. We have also produced short forms on this NDC. We have in place an NDC investment strategy and all the required documents. Since Namibia is signatory to the United Nations Framework Convention on Climate Change (UNFCCC), there are quite a few documents that we needed to have submitted to enable the global stock-take to take place, such as our biannual reports and our national communications. These are in. We are currently busy finalizing the adaptation communications, which is also due before the COP starts, and then we also have in place a resource mobilization strategy for the Green Climate Fund.

HSF: *Well, quite a lot of plans that are there. You speak of NDC, which is basically Namibia's attempt and/ or strategy to reduce its emissions by 91 percent by 2030. Every other person would say "Well, that's idealistic, that's ambitious, is that realistic?" And what would you say to somebody who says, "Oh, that's too ambitious"?*

Bernadette Shalumbu-Shivute: For Namibia it's definitely a very ambitious target. It was deliberately set. And it's by far one of the highest targets. Our first target was 89 per cent. You have to set a higher target every five years, you can't regress. So we went for 91 per cent and we are saying we can achieve 91 per cent greenhouse gas emissions reduction only if we get the money that is due to us. So that is how we are going to achieve some of the targets. But if you compare with our neighbouring countries, for example, South Africa is only aiming to reduce emissions by 28 percent. Botswana is going to reduce emissions by only 15 per cent. And Zambia only aims to reduce emissions by 25 percent. So you can see Namibia is totally on a different league here, but of course we are called Land of the Brave, so that's why we have also set this very high target. On the question of what Namibia is going to negotiate: There's quite a few things that we are negotiating, but I think two most important ones: The first one is on financing. Of course, we can only achieve those NDC targets if we have money. So we definitely are going to urge the industrialized nations to scale up climate financing.

And also on the issue of mitigation, whereby Namibia is urging all parties to submit more ambitious NDCs because Namibia can't be the only country with a 91 per cent target for emissions reductions and everybody else is aiming for about 15 percent. When will we ever reach the goals of the Paris Agreement?

HSF: *Thank you very much. And yes, indeed. Namibia is the Land of the Brave, so very commendable from the Namibian government to want to reduce carbon emissions by 91 percent.*

My next question is directed to Dr Jonathan Kamwi of the Namibia University of Science and Technology: We live in a world of COVID, whether we like it or not. It has shown cracks, whether societal, political, economic, all over the world in various strata and various economic situations. Jonathan, please tell us, what is the potential of the much touted "green growth" in a post-COVID reconstruction? Is it hype? Is it feasible? Is it something that Namibia can exploit?

Dr Jonathan Kamwi: Thank you very much. It's actually very feasible. We find that the green post-COVID recovery has the potential of enhancing resilience of economies as well as society. So the economic stimulus packages which the government is actually looking at, has the potential to create jobs, income and at the same time create opportunities for solving environmental challenges such as climate change. So when you integrate environmental as well as inclusive aspects of recovery, you have the mutual benefit in terms of looking at environmental challenges, and at the same time, increasing resilience of our communities

to the impacts of climate change. So if all these ones are taken into account, you find that the problems associated with inequalities will be actually brought to a minimum. So it's very important that we really look at having these challenges addressed by these stimulus packages that we are trying to implement, both at private as well as government levels.

HSF: *Clemens, would you say that, despite the debilitating effects of COVID, this is sort of an opportunity for a reset where we can start new with this much talked about green growth?*
Clemens von Doderer: COVID certainly provides its challenges for Namibia. Being one of the driest countries in the world, Namibia is used to hardship. However, 300 days of sunshine per year can also be an opportunity. It is for this and for other reasons, that Namibia is considered one of the high potentials for hydrogen production. Consequently, this could be also an opportunity for industrial and economic development of Namibia. So, by turning a perceived disadvantage into an advantage, Namibia could become the new 'Texas' or the new 'Middle East' not in terms of oil production, but in terms of hydrogen production. It offers a huge opportunity for the economy to thrive and for jobs to be created. Also, the Namibian government will certainly benefit from that. Increased revenues will allow more funding for the educational sector and infrastructure development. Overall, it will be a sizable contribution to uplift the socioeconomic development of Namibia. Hydrogen is only one example to provide Namibia with new opportunities. Very much linked to hydrogen is electricity production in general: Solar power as the obvious renewable energy opportunity, but also wind and tidal power. Namibia has more than 1,570 kilometres of coastline, where tidal energy could play a role. Namibia could become a massive energy exporter in the long run if the cards are being played right. Another advantage we have is that we have space, allowing us to set up sizable solar and wind parks. So we can put up systems like that. Namibia has one of the lowest population densities on the planet, so there are big areas available for production systems like that. And Namibia is very responsive to change: with about 2.6 million people, any kind of change has a direct impact on society. Consequently, I'm very confident if we play the cards right, Namibia will be on the right track for a very promising and prosperous future.

HSF: *If we play our cards right, Bernadette, we know that climate change affects disproportionately marginalized communities in poor situations. If we play our cards right, why is it that marginalized communities are affected so adversely and disproportionately by climate change? And what can we do? I mean, speaking of what Clemens just spoke about in terms of all the potential of green growth? Let's first talk about marginalized societies, why they are adversely affected and whether them getting out of it can be tapped into what Clemens was speaking about.*
Bernadette Shalumbu-Shivute: Yes, Barbara, as you rightfully stated, our marginalized communities are disproportionately affected by climate change, because their coping capabilities are very low. And that is because in rural areas, people haven't completed education to a certain level, they don't have access to jobs, employment is very low and they don't have alternative livelihoods. This makes their coping capabilities very low, for example, if you compare them to us. What government does is they conduct various vulnerability risk assessment studies in key sectors, to identify these populations and also some of the ways that we could best assist them. Currently at the ministry, we are busy with doing the vulnerability communication. It goes to the UNFCCC (United Nations Framework Convention on Climate Change) to communicate the existing gaps and also how to best assist these vulnerable communities. We also use the same strategies to identify projects and programs, and you will observe that some of the projects the EIF (Environmental Investment Fund of Namibia) is currently doing in the Zambezi and in Kavango are informed by these vulnerability studies.
The second question about how do we unlock green growth: For those who are following the

news, you might probably be familiar with the green economic pillars under the president's Harambee Prosperity II (Action Plan of the Namibian Government Towards Economic Recovery and Inclusive Growth, period 2021-2025), and the two most crucial pillars for this are water security and energy security. We are saying if the country can increase its share of renewable energy and become a net exporter of clean energy, this has the potential to unlock enormous opportunities. We are looking for example at employment opportunities. If people are employed, this obviously takes them out of that vulnerable category. In terms of water security, our Ministry of Agriculture, Water and Land Reform has completed feasibility studies for seawater desalination; another initiative that we are moving into is to increase water banking opportunities, groundwater desalination, rainwater harvesting and also reclamation of water in other towns outside of Windhoek. So obviously, if we combine all of that, I think the spin-offs are unimaginable.

HSF: *Let me bring my next question to Jonathan. All over the world, we see young people advocating for climate action. Perhaps most prominently, the Fridays for Future demonstrations that we get to see all over the world, with Greta Thunberg, Vanessa Nakate. How can Namibia include our Namibian youth in the climate change debate and even policymaking? To not only being invited to the party, but also to take part in the dance?*

Jonathan Kamwi: Thank you very much. It is very important for the youth to be interested in climate change issues. It is in their best interest because they are the ones who will be impacted by climate change in the future. It is very important that they really participate in issues of climate change. So one of the important thing that the country can do is to develop robust forums for these young people to participate in terms of a climate change dialogue. And at the same time, we have to consider childhood development and impart knowledge about climate change, especially the consequences and how to solve the challenges, how to adapt to the impacts, at a very young age. So it is very, very important that even the messages that we pass across are designed in such a way that they are 'sexy' to be adapted or absorbed by our youth.

HSF: *Clemens, what would you say? Would you advocate for youth to have a voice? After all, it is their future.*

Clemens von Doderer: Absolutely. I think the youth needs to be vocal. It needs to be politically active and engaged. I think it's an interesting trend we see nowadays with climate change, more active engagement like last we've seen in the late 60s in Europe. So it is actually good to see that, but it's a two-way street. You know, the one thing is to be vocal and to raise concerns, but also to come up with ideas and answers. The youth is very engaged with social media and new technology, so certainly they have new ideas. But at the same time, it's important also for the leaders of the world and, to bring it down also to the Namibian level, for our Namibian leaders to listen to what the youth has to say. After all, Namibia has also a relatively young population: just to put it in perspective, the average age in Namibia is 23; and the average age in, for instance, Germany is 43. So there is a significant difference. Namibia's leaders need to have an interest in what the youth has to say, and not only to listen, but also to translate it into their policymaking. I think that is the key to provide the policy framework for the future. There is an urgent need to tackle the questions the youth has today. One might simply agree that this is actually the mandate of Namibia's leadership. But there is more. Namibia's constitution requires the State to do so. Article 95.I refers to the sustainable use of the resources so that today's and future generations can benefit from them. The State has to ensure that resources are being managed in such a way that future generations can also sustain their livelihoods, using these resources. So coming back to the issue on forestry, losing 25 percent of forest cover is definitely not the answer.

There is an urgent need not only to maintain the existing forests, but also increase the forest cover again. This would secure the livelihoods of the communities on the ground, not only today, but also for the future genera-

tions. At the same time, we all will benefit from it, as forests are key to mitigate the impacts of climate change.

HSF: *My last question, and in conclusion of our podcast, I will address it to Clemens: Here at the Hanns Seidel Foundation, we have quite a lot of projects to support the policy and goals of the government with regards to climate. Please tell our audience what various projects we have.*

Clemens von Doderer: Since 2015, we are running a campaign across the country called TH!NK NAMIBIA. That campaign is being implemented in various phases. The initial phase in 2015 to 2017 was on raising awareness on environmental issues and climate change. Looking at these aspects more generally, we trained teachers, learners and young adults, engaged with journalists and the general public, and developed a series of publications, including fact sheets, posters, etc. The second phase was on promoting renewable energies in Namibia, where pilot schools have been equipped with solar power systems. Learners and teachers alike have been trained on the use of renewable energies, but there was also an advocacy campaign at national level on promoting the use of renewable energies.

And right now we are running two more phases under the TH!NK NAMIBIA umbrella. One is funded by the Finnish Embassy here in Namibia and deals with the use of aquaponics systems at pilot schools, following a similar approach like to our renewable energy project. Aim is to improve food security and diversity at selected educational institutions, as well as to make food production more sustainable. Aquaponics systems can be compared to a compact greenhouse with fish tanks attached. The fish are being fed and then the drain water from the fish tanks is then being used as fertilizers and plant feed to grow vegetables and fruits.

And lastly, our latest project in this family of TH!NK NAMIBIA is our Promoting sustainable forest management in the Kavango and Zambezi region of Namibia project, which is geared towards improving the awareness, the knowledge about why it is important to follow a sustainable approach on managing forests. We are engaging with local stakeholders, including government representatives from the ministries, representatives from traditional authorities (the chiefs, the headmen), but also the management committee members of community forest and conservancies. All of them receive training and are engaged through roundtable discussions and other dialogue formats, to be part of a joint movement, eventually to contribute to a more sustainable approach to managing the forests in Namibia. We are not only engaging the people on the ground, but also the decision makers at government level. In November 2021, we hosted a public-parliamentary engagement together with the Office of the Speaker of the Namibian Parliament. Attended by the members of the Standing Committee on the Management of Natural Resources, the engagement gave experts from various fields an opportunity to share their insights and views on the State of forests against the backdrop of COP26. Aim was to enable the Parliamentarians to take better decisions on the issue of managing forests and in a wider sense, to tackle climate change from that perspective.

HSF: *Thank you very much, Clemens, for the very detailed explanation on the activities the Hanns Seidel Foundation is implementing in Namibia in the field of climate change mitigation and adaptation. Thank you very much for all your contributions.*

|| This interview was published as a podcast of the Hanns Seidel Foundation in the series "Global Perspectives". Listen to it in the HSF podcast player: Global Perspectives, URL https://www.hss.de/mediathek/#c44249

|| Barbara Kahatjipara

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|| Bernadette Shalumbu-Shivute

Bernadette Shalumbu-Shivute is a Senior Conservation Scientist at the Ministry of Environment, Forestry and Tourism of Namibia since 2019. She is primarily concerned with mobilizing resources for climate change intervention, stakeholder coordination and project management. Bernadette Shalumbu-Shivute participated in the COP26 as a delegate.

|| Jonathan Kamwi

Dr Jonathan Kamwi is Lecturer and Head of Department of Agriculture and Natural Resources Sciences at the Namibia University of Science and Technology. As a forest scientist he specializes in socio-ecological systems in forests, Geographical Information Systems, Remote Sensing and Forest Inventory. His research group works on a range of projects in remote regions of Southern Africa and other forest ecosystem in Africa

|| Clemens von Doderer

Dr Clemens von Doderer is the Resident Representative of the Hanns Seidel Foundation in Namibia since 2016. Prior to joining HSF, Dr von Doderer served as a Policy Advisor to the Central Association of European Forest Owners (CEPF) in Brussels, Belgium. Dr von Doderer holds a Bachelor's degree in Forest Sciences from the Georg-August-University in Göttingen, Germany, as well as a Master's and PhD in Agricultural Economics from the University of Stellenbosch, South Africa.

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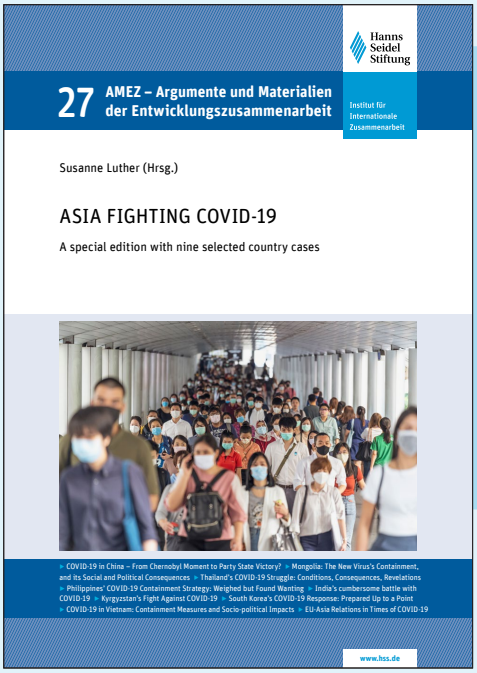

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