TECHNOLOGY NEEDS ASSESSMENT

ACHIEVING THE SUSTAINABLE DEVELOPMENT GOALS

EXPLORING LINKAGES WITH TECHNOLOGY NEEDS ASSESSMENTS

This briefing note discusses key linkages between the Sustainable Development Goals (SDGs) and the UNFCCC-mandated Technology Needs Assessments (TNAs), and the role of technology *per se* in achieving sustainable development. Reflecting on many years of experience in conducting TNAs, the brief concludes with some recommendations on how to sharpen the linkages between country-driven efforts to achieve climate-related SDGs, including how to link TNAs to specific SDG targets and indicators. In doing so, the brief aims to elaborate on the role and importance of TNAs in both strategic and operational terms, and on how nationally driven technology action plans can be implemented and make an impact.

WHAT ARE THE SDGS?

The 2030 *Agenda for Sustainable Development* was adopted by all UN Member States in 2015 and centred on 17 Sustainable Development Goals (SDGs) agreed on and applicable to all countries, both developed and developing.

The SDGs contain a total of 169 targets and 232 indicators to measure and track progress towards implementation. As such, the SDGs are an effective means to focus political attention and gather resources (both technical and financial) around a set of clear and commonly-agreed global goals. The 2020's have been called the 'decade of action', a 10-year period in which the world must achieve the SDGs.

WHAT ARE THE TNAS?

TNAs were strongly emphasized in the Paris Agreement, and they play a central role in the newly agreed UNFCCC Technology Framework, which provides overarching guidance to the UNFCCC's Technology Mechanism.

A TNA is a set of country-driven, participatory activities leading to the identification, selection and implementation of climate technologies in order to reduce greenhouse gas emissions (mitigation) and/or vulnerability to climate change (adaptation). Specifically, the TNAs follow a step-wise process whereby climate technologies are first prioritized, then selected for in-depth analysis on existing barriers to their uptake and diffusion in an economy. The final step, summarised in a Technology Action Plan (TAP), is to identify what needs to be done to create and/or expand market systems and enabling conditions for greater technology diffusion and uptake. These TAPs can be taken by governments to multilateral funding bodies, including the regional development banks and the Green Climate Fund, to unlock and leverage the promised billions of USD in global 'climate finance'.

gef
UNEP DTU PARTNERSHIP
UN environment programme

TECHNOLOGY NEEDS ASSESSMENT

Achieving the Sustainable Development Goals: exploring linkages with the UNFCCC-mandated Technology Needs Assessments

ISBN: 978-87-94094-00-9

AUTHORS: James Haselip, Léa Jehl Le Manceau

Design & layout: Kowsky / kowsky.dk

UNEP DTU Partnership

February 2021

UNEP DTU Partnership
Copenhagen, Denmark
www.unepdtu.org

As a country-driven process, the TNAs aim to build upon, or contribute to, similar ongoing processes, in order to support national sustainable development and, not least, the implementation of countries' Nationally Determined Contributions (NDCs) to the Paris Agreement of the UNFCCC. As TNAs are also participatory in nature, their success depends upon the involvement of all relevant stakeholders on the assumption that any given technology is more likely to be understood, accepted, supported and implemented at all relevant levels, i.e. from government ministries to farmers or households, if all stakeholders are involved throughout the TNA process.

With funding from the Global Environment Facility, UNEP, through UNEP DTU Partnership, supports developing countries in preparing their TNAs and TAPs within the global Technology Needs Assessment (TNA) project. Since 2009, close to a hundred developing countries have joined the project.

WHAT IS A 'CLIMATE TECHNOLOGY'?

It may seem obvious what a technology is, but in reality there are various dimensions to this broad term and it is useful to unpack this before exploring the relationship between the SDGs and the TNAs. The Intergovernmental Panel on Climate Change (IPCC 2000) defines technology as 'a piece of equipment, technique, practical knowledge or skills for performing a particular activity'. In terms of being a 'climate technology', the particular activities must be ones that have a direct and measurable positive effect in efforts to reduce greenhouse gas emissions and/or enable a particular economic sector or population to better manage or adapt to the effects of climate change.

LINKAGES FROM TNAS TO SDGS

While almost all SDGs are inter-connected, some have a stronger logical link to the TNAs. Among others, the TNAs contribute to achieving the following Sustainable Development Goals:

CLOSE UP ON SDG 13: TAKE URGENT ACTION TO COMBAT CLIMATE CHANGE AND ITS IMPACTS

Why is there an SDG specifically for climate change? The SDGs were agreed a few months prior to the signing of the Paris Agreement in 2015. In the face of uncertainty about the UNFCCC process, it was agreed that climate change should have its own SDG, with specific targets and indicators. The targets are:

- 13.1: *Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries*
- 13.2: *Integrate climate change measures into national policies, strategies, and planning*
- 13.3: *Improve education, awareness raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning*
- 13.a: *Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible*
- 13.b: *Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities*

The scope and objectives of the TNAs fit neatly with the targets of SDG 13, speaking to the language on both mitigation and adaptation-side actions, national ownership, capacity building and multilateral funding.

The 'technology agenda' is closely linked to goal #17, which aims to "strengthen the means of implementation and revitalize the global partnership for sustainable development" and to goal #13, which aims to "take urgent action to combat climate change and its impacts". In addition, SDGs #6, #7, #9 and #15 are strongly supported by TNA activities, as these specific sectors are highly prioritized by countries undertaking TNAs, for climate change adaptation and mitigation purposes.

HOW DO THE SDGS AND TNAS RELATE AND CONNECT AT THE STRATEGIC LEVEL?

There now exist globally-agreed indicators for all targets of all SDGs, though data remains incomplete. However, from what we do know, e.g. where there is available and verifiable global data, we can see that progress across the SDGs is uneven. The progress made by countries towards SDGs implementation can be tracked on the following link: https://sdg-tracker.org/.

For some SDGs such as biodiversity and ecosystems, progress has been negative against the baseline year. However, for those where progress has been positive, technology is often a driving force for change, and we can plot the history of prioritized technologies within the TNAs against the progress against specific SDGs. Although we do not suggest causation, we may be able to indicate correlation between these two observations.

In terms of climate change mitigation actions, access to affordable and clean energy (SDG 7) is the main SDG. However, major sources of greenhouse gas emissions come from activities that speak directly to other SDGs,

SDG 7: WHERE TECHNOLOGY IS DRIVING PROGRESS ON ENERGY ACCESS (TARGET 7.1)

Global Progress towards some of the SDG 7 targets has been positive, especially on access to electricity where in 2018 the total global population without access to electricity (either on or off-grid) was 789m, compared to 1.2bn in 2010.

In large part this progress is due to rapid advances in solar PV, battery and LED technology, both hardware and software, which has enabled (*and been enabled by*) significant policy-driven market creation and price drops. Indeed, solar PV technology is one of the top TNA priority technologies, featuring in the TNAs of 39 countries between 2010 and 2020.

New technologies have the potential to accelerate the electrification target, especially in off-grid areas of Africa where the feasibility, supply and cost of mini-grid + battery systems is now close-to-market. Technological progress on efficient appliances and 'smart grids', e.g. improved demand-side management, is driving the access agenda by reducing the need for investment in excess generation capacity and hence lowering the capital cost of new power systems.

However, the global population without access to clean cooking solutions remains around 3bn, basically unchanged since 2010 and even declining in some countries against population growth. The lack of progress on access to clean cooking fuels is largely due to a lack of a significant technological breakthrough akin to the impact of PV technology for electricity access.

especially from agriculture, forestry and land use. In the TNA process, access to affordable and clean energy is a central goal, with 95% of countries prioritizing the energy sector across all regions. A majority of prioritized technologies are related to electricity generation, with solar energy (including solar PV, solar thermal and other solar energy technologies) constituting the most prioritized technology, followed by hydropower, energy efficiency in building and lighting systems, and bioenergy. Other technologies focus on energy management (energy strategies and plans as a technology) or heat production (often linked to electricity generation).

Likewise, on the adaptation side, access to clean water and sanitation (SDG 6) is a key goal for countries. 87% of countries prioritized the water sector in their TNA process and prioritized technologies such as rainwater-harvesting, stormwater reclamation and reuse, water-quality monitoring, integrated riverbasin management, hydropower and the mapping of extreme water events. Other technologies and practices to build resilience to climate change in the water sector include water monitoring and modelling, saltwater desalinisation and the development of resilient infrastructures.

LINKING TNAS AND SDGS FOR INVESTMENT IN 'GREEN GROWTH'

Ultimately, the TNAs are intended to stimulate or enable the production of investment-ready climate change mitigation or adaptation projects. In reality, that is how technology 'transfer' takes place, e.g. through public or private investments that either replace or upgrade existing technologies with cleaner and more climate-resilient alternatives. Alternatively,

FIGURE 1. PERCENTAGE OF COUNTRIES PRIORITIZING KEY SECTORS FOR CLIMATE CHANGE MITIGATION

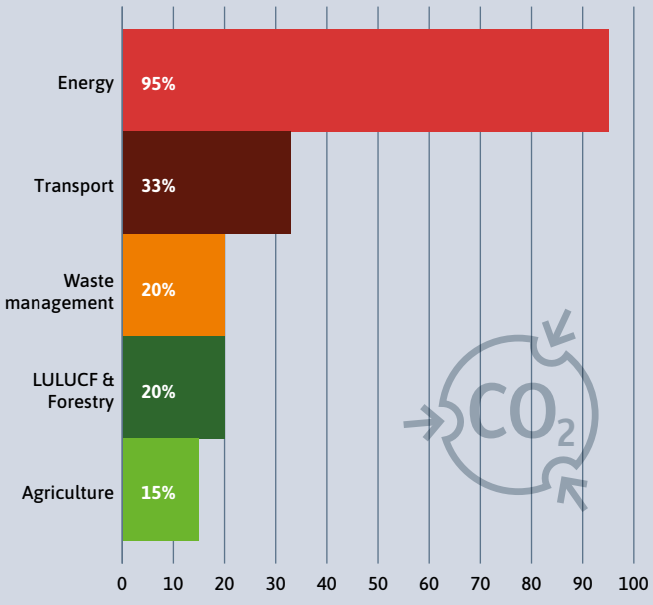
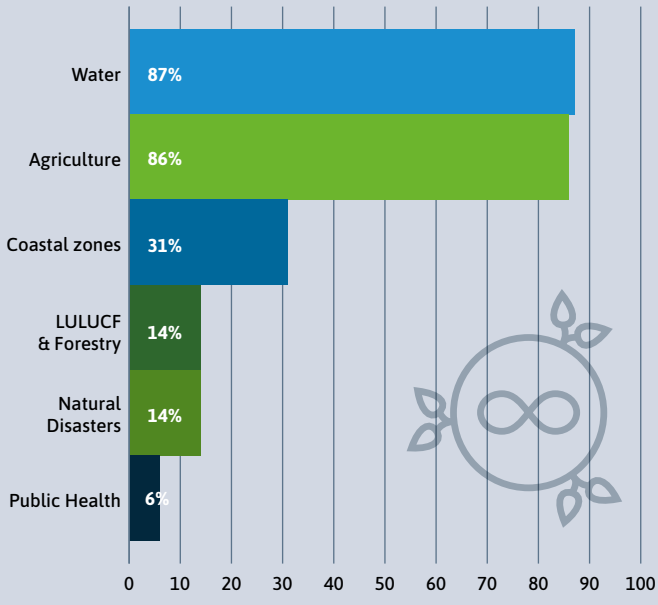


FIGURE 2. PERCENTAGE OF COUNTRIES PRIORITIZING KEY SECTORS FOR CLIMATE CHANGE ADAPTATION



SDG 5: TOWARDS GENDER EQUAL TNA ACTIVITIES (TARGET 5.5)

The United Nations define the target 5.5 of SDG 5 as follow: "ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life."

In the TNA process, an emphasis is put on systematically mainstreaming gender issues into countries' activities. The goal is to ensure that men and women benefit equally from actions set out in TNAs and that gender inequalities are reduced or eliminated throughout the entire TNA process and its outcomes. As such, countries undertaking Technology Needs Assessments are supported and guided throughout the process to consider technology options based on gender analyses, to agree on gender-specific goals, and to integrate gender issues into the TNA activities.

For example, in 2019, Vanuatu integrated the Department of Women's Affairs and the Vanuatu National Youth Council in their working groups. In 2019, Uganda developed a set of gender-responsive criteria for technology prioritization: the ability to reduce labour demand for both women and men; number of women, men and youth gaining from the technology; increasing employment, catering for the needs of women, men, children and the youth.

Countries undertaking TNA activities are ensuring that the composition of their working groups allow free expression of thoughts and ideas by both men and women experts and that there is a gender-equal participation in the decision-making process of the TNA. This illustrates that the scope and objectives of the TNAs fit neatly with the targets of SDG 5, target 5.5.

technology transfer processes can occur through investment in new infrastructure or efforts to stimulate behavioural change that will reduce emissions or enhance resilience to the effects of climate change. In the process, these investments contribute (directly or indirectly) to various SDGs and the broader concept of Global Green Growth.

In order to achieve this broad vision, it is necessary to combine resources – both technical and financial – at the global and local levels. This implies better coordination and dedicated focal persons, including with national TNA working groups and stakeholder consultations. These can be defined and organised in such a way as to focus the intended outcomes of the national TAPs to specific SDG policy, planning and financing.

In reality, the TNA process is but one of many related nationally driven processes that aim to achieve NDCs and national SDG priorities. As such, linking these two realms requires that targeted and project-specific investment opportunities are followed up through government leadership, informed by the stakeholder-driven and evidence-based technical outputs of the TNA and related analyses.

When it comes to implementing the 'green growth' agenda, beyond the rhetoric and into the realm of specific and large-scale investments, there are various global partners and multilateral organisations that welcome country-driven investment proposals based on the conclusions of the TNAs. This includes the Green Climate Fund, the Adaptation Fund, the Global Environ-

ment Facility, the Climate Technology Centre and Network, and Regional Development Banks. These sources of publicly funded finance are crucial for many lower-income countries where investment risks limit the scope and scale of purely commercial investment opportunities, even for similar technology-driven projects that secure private equity or debt financing in OECD or large emerging economies.

The 'build back better' agenda in response to the Covid-19 pandemic complements the green growth agenda by providing both the climate and sustainable development communities with a renewed political mandate to work with developing countries on harmonized analysis, policy, planning and project development. In many cases, especially on the climate change mitigation side, this means linking technology-focused work to SDG-specific activities and sources of multilateral investment to either incentivise or de-risk private sector investment in specific projects.

For large infrastructure projects that mostly require a larger share of public financing to support climate-resilient development, there are likely many co-benefits in terms of improved public health, for example in public transport and urban planning. Thus, the quantification and inclusion of these technology-driven and 'pandemic-proofing' co-benefits can support the case for scaled-up public investment in projects that explicitly value both national climate and SDG targets and priorities.

Pratima Baral, researcher at the International Maize and Wheat Improvement Center (CIMMYT) using Plantex app. Photo by C. de Bode/CGIAR

WWW.TECH-ACTION.ORG

WWW.UNFCCC.INT/TTCLEAR/TNA

Follow us on Twitter @UNEPDTU, @UNEP and @UNFCCC