

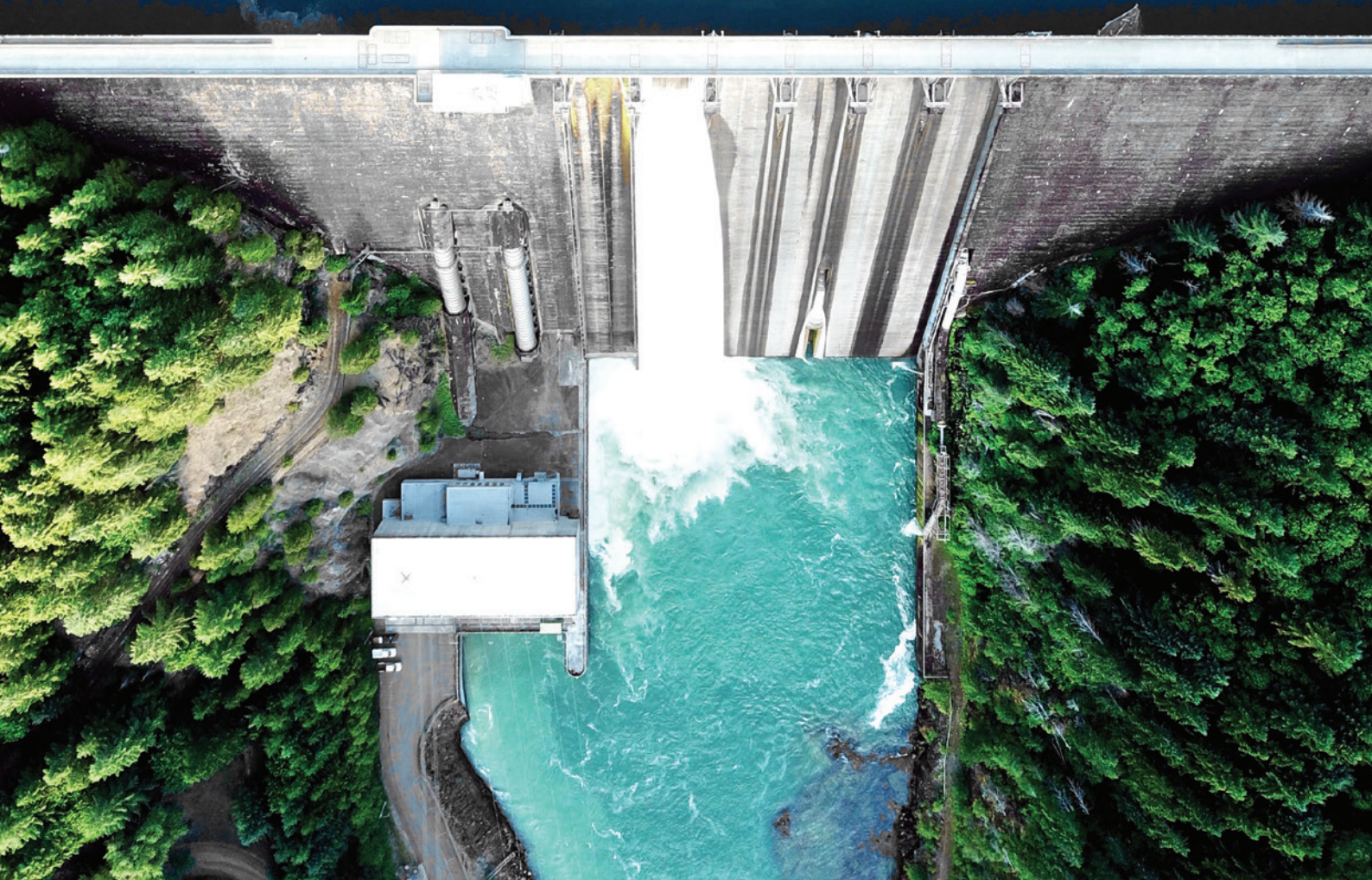


United Nations
Framework Convention on
Climate Change

TEC Brief #13

TECHNOLOGY
EXECUTIVE
COMMITTEE

Enhancing implementation of the results of technology needs assessments





Why this TEC Brief?

Understanding climate technology needs is a starting point for effective action on climate change as it can help to determine how to reduce greenhouse gas emissions and to adapt to the adverse impacts of climate change. To determine their climate technology priorities, countries undertake TNAs on the basis of their national sustainable development plans. The aim of TNAs is to build national capacity and facilitate analysis and prioritization of climate technologies to support implementation of the Paris Agreement and achievement of the Sustainable Development Goals.

This policy brief:

- (a) Describes gaps and challenges and good practices in the TNA process;
- (b) Provides examples of countries' progress in implementing technologies prioritized in their TNA reports;
- (c) Addresses key factors for successful implementation of prioritized technologies, both during and beyond the conducting stage of the TNA;
- (d) Discusses ways and means of improving the TNA process to help developing countries to create or enhance the conditions, including capacity-building, for successful implementation of results after the TNA has been finalized.

It provides recommendations for further action by international, regional and domestic actors, including policymakers in developing countries, international organizations, financial institutions and private sector actors.

Highlights:

- Implementing the results of TNAs remains the priority for the further success of the TNA process. The numerous examples of implementation of TNA results, lessons learned and good practices demonstrate the success of the TNA process so far.
- Engaging key stakeholders, including decision makers, throughout the TNA process is instrumental in ensuring that prioritized technologies are included in new and ongoing governmental programmes, strategies and plans so that sectoral goals can be achieved by means of specific action identified in TNAs and TAPs. It also helps to substantiate requests for funding from domestic and international instruments.
- In relation to enhancing capacity-building, countries are invited to consider the work under other processes and of constituted bodies under the Convention, including the Paris Committee on Capacity-building, aimed at addressing current and emerging capacity gaps and needs and enhancing capacity-building in developing countries, including the least developed countries.
- Co-developing TNAs and TAPs with NDCs, NAPs, and GEF, GCF and Adaptation Fund projects and using TNA results as inputs thereto helps to mainstream TNA outcomes in overarching national strategies and programmes for climate and sustainable development.
- It is considered good practice to engage possible funders of TAP activities early in the TNA and TAP process so that country stakeholders are aware of what funders are willing to finance and to avoid mismatches between countries' and funders' priorities. Engaging, in particular, in-country donors and national focal points of international climate finance mechanisms is recommended for the TNA to become a collaborative process, leading to higher chances of funding and implementation.
- Clarity on ownership among the key stakeholders increases the chance of implementation of TNA results. While the TNA process itself is often coordinated and 'owned' by a ministry of environment, it is good practice to discuss from an early stage who will take responsibility for TAP implementation. This could be a specific line ministry, but there are also good practice cases of governmental working groups taking responsibility for implementation beyond completion of the TNA process.
- Developing pilot projects helps to demonstrate available technology options and generate experience with their use and ability to deliver financial and other benefits. Financial assistance for implementing such pilot projects is available through various channels, including multilateral and bilateral funding programmes. Technical support and advice can be provided by various organizations, such as the CTCN, including for the preparation of concept notes for funding proposals, and the delivery of training to enhance local capacity.
- Key to the success of the TNA process is integrating TNA results into the national policy framework, such as for development and climate purposes. As a result, the integrated technology options are more likely to be financially supported. From the perspective of technology-neutral policies, integration with the TNA process is also attractive since it is an unbiased process whereby technology options are shortlisted in line with a country's social, economic and environmental priorities and measures for optimizing relevant market conditions are recommended.
- Countries can build on their TNA results by seeking funding from various sources, including the GCF. However, owing to limited resources and capacity, it can be challenging to progress from a TAP to a successful funding proposal. An example of good practice in this regard is provided by a private bank, operational in a TNA country, that considered TNA-prioritized technologies as input to a GCF funding proposal.
- The likelihood of implementation of a country's TNA results is strongly affected by the quality of its TAP. An analysis of TAPs prepared during phase II of the global TNA project showed that the quality of information in TAPs had significantly improved since the previous phase as many countries followed the updated TAP guidance prepared by the TEC in 2016.
- Equipped and trained TNA champions are key to continuing projects beyond the TNA process.



1

Gaps and challenges

Despite the high implementation potential of TNA results and TAPs, several challenges and unaddressed needs remain, notably lack of domestic capacity to facilitate implementation, limited access to funding sources in many developing countries, and lack of involvement of funding institutions in the early stages of the preparation of project proposals.

Although most countries have already established experienced groups of stakeholders around the TNA teams, in some regions implementation-oriented approaches are not sufficiently considered, including national-level policies, strategies and programmes and financial incentives.

Further challenges in conducting TNAs and implementing their results include:

- (a) The infrequency of TNAs, being an evolving process, not matching with the evolution of NDCs;
- (b) Late engagement of funders with TNA teams;
- (c) Modifying TAPs to attract funding from available sources;
- (d) Matching consultants with governmental priorities;
- (e) The mismatch between priority needs identified in TNAs and priorities of donors;
- (f) Monitoring and evaluation being outside the scope of the TNA process.

The likelihood of implementation of a country's TNA results is strongly affected by the quality of its TAP. An analysis of TAPs prepared during phase II of the global TNA project showed that the quality of information in TAPs had significantly improved since the previous phase as many countries strictly followed the updated TAP guidance prepared by the TEC in 2016.

Some TNA stakeholders have expressed the wish to deviate from the recommended tables in the TAP guidance; for example, when it is already clear which funding source will be pursued (e.g. the GCF) for an action, the TAP can be developed in line with that funder's demands (e.g. in line with the specifics of a GCF call for proposals). In this context, it is recommended to underline in the TAP guidance that the steps and tables form a suggested structure for compiling a TAP rather than a prescriptive methodology.

TNAs can be followed up on in subsequent TNA phases, but the continuation of the TNA process is not institutionalized in the global TNA project; whereas updating NDCs has been defined as a requirement under the Paris Agreement. While TNA coordinators agree that a tracking system for monitoring implementation of TNA results would be useful, they warn that many countries do not have the capacity to implement such a system.

As an example, the secretariat has conducted two project tracking surveys in order to provide regular updates on the progress of implementation of the results of TNAs, including success stories. In doing so, the secretariat developed fact sheets with a questionnaire targeted at TNA project developers. The secretariat invited TNA project developers to complete and return factsheets and questionnaires online via a dedicated web page for each project proposed on the basis of the information in the TNA reports.

Countries themselves could conduct similar tracking, if appropriate incentives were provided. Another option could be to involve national designated entities and the CTCN, whereby similar methodology could be adopted but scaled up to the global level.



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Good practices of TNA implementation

There are several examples of countries that have been successful in advancing their TAPs towards implementation. The examples herein have been taken from the overview of TNA success stories published by the secretariat and UNEP DTU Partnership.

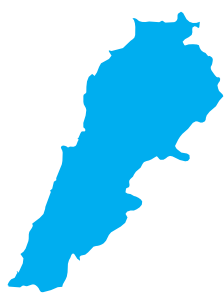
Overview of success stories in implementing results of technology needs assessments

Country (phase of global TNA project)	Priority identified in TNA	Action to advance implementation
Bhutan (phase I)	Intelligent transport systems	Use TAP for application to CTCN; training and field visits and additional training on developing a NAMA
Honduras (phase II)	Sustainable livestock production	Sustainable livestock NAMA identified in TNA and TAP; NAMA and TNA in tandem
Jordan (phase II)	Grassland management	Pilot project funded by the GEF; concept note for the GCF, supported by the CTCN and UNEP DTU Partnership and TNA outcomes
Lebanon (phase I)	Harvesting rainwater to make up for lack of precipitation	Three pilot projects by UNDP and the Ministry of Environment for harvesting rainwater from greenhouse rooves
Mali (phase I)	Field contouring to prevent rainwater run-off	Field contouring applied in the rural city of Koutiala with help from the CTCN
Mauritius (phase I)	Energy-efficient boilers using waste heat recovery	Based on the TAP, boiler economizers installed under a project of the GEF, UNDP and the country's Energy Efficiency Management Office, as part of a broader project on energy efficiency in industry
Mongolia (phase I)	Energy efficiency and renewable energy technologies	XacBank used TNA outcomes to develop a loan programme, the first private sector entity in a developing country to receive funding from the GCF (USD 20 million) to extend its existing business loan programme of USD 60 million; expected impact: 149,290 tonnes of carbon dioxide emission reduction per year
Morocco (phase I)	Solar electricity technologies	NAMA for use of solar photovoltaics in households, facilitating implementation and readiness for mitigation project; 30,000 solar pumps to be installed in 2015–2025
Republic of Moldova (phase I)	Health, medical emergency care and rehabilitation	Medical emergency care and rehabilitation measures, as identified in the TNA and TAP, introduced by the Ministries of Health, Education and Interior as well as local authorities
Senegal (phase I)	Biomass for electricity	Governmental feed-in tariff system for renewable energy technologies; projects initiated by a private company and the National Office of Sanitation; uptake biomass in energy transition programme
Thailand (phase I)	Precision farming; decision support system freeware	TNA incorporated into Thailand's Climate Change National Plan 2015–2050; pilot project for developing decision support scheme freeware for farmers
Uruguay (phase II)	Diversification of electricity mix with a strong domestic renewable energy component	Local capacity-building in relation to new renewable energy and electricity storage technologies, considering future scenarios in which surplus stored will be used to meet local electricity demand in some key sectors of the national economy

In several countries, the role of one or more stakeholders as 'technology champions' was exceptionally strong, and hence instrumental for implementation of results after completion of the TNA process.



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Country case study: Lebanon

In Lebanon, three pilot projects have been developed by the Government for harvesting rainwater from greenhouse rooves, whereby an additional water source can be generated for irrigation purposes and use by farmers, as prioritized in the country's TNA. The Lebanese Ministry of Environment and UNDP collaborated on developing guidelines for farmers to replicate the technology throughout the country.

Success factor: stakeholders informally consulted during the TNA process continued their contact to form informal stakeholder groups for communicating with policymakers on policies for prioritized technologies.



Country case study: Mauritius

In Mauritius, the TAP for waste heat recovery for energy-efficient boilers was used for preparing a proposal to the GEF, addressing energy efficiency in industries. Mauritius also acquired funding from the International Atomic Energy Agency to implement (parts of) a TAP on micro irrigation in agriculture, in pilot projects with smallholder farmers, thereby using innovative techniques to combat pests in agriculture. The success is largely attributable to the sound collaboration between the staff of Mauritius' Food and Agricultural Research and Extension Institute and the International Atomic Energy Agency, which resulted in a clear and common understanding of opportunities for funding and pilot projects. Moreover, for integrated pest management activities, as identified in the TAP, funding was acquired from the Global Climate Change Alliance.

Success factor: effective collaboration (personal contact and trust) between the staff of Mauritius' Food and Agricultural Research and Extension Institute and the International Atomic Energy Agency.



Country case study: Senegal

In Senegal, uptake of biomass-based technologies for electricity production, as prioritized in its TNA, has been accelerated through public-private collaboration. The Government established a feed-in tariff scheme for renewable energy technology use, while a private company was responsible for technology implementation. This has resulted in biomass-based electricity production that supports the inclusion of biomass use in Senegal's energy transition programme for its NDC.

Success factor: responsibility shared between public and private sector stakeholders, as suggested in the TAP guidance.

Ways of enhancing implementation of results of technology needs assessments

From the examples of implementation of TNA results, the following key factors for success can be derived:

- (a) Engaging stakeholders and ministries during and after the TNA process is instrumental in ensuring that TNA-prioritized technologies are included in new or ongoing governmental programmes so that sectoral goals can be achieved by means of action identified in TNAs and TAPs. It can also help to substantiate requests for funding from domestic and international instruments;
- (b) Co-developing TNAs and TAPs with NAMAs, NDCs, and GEF, GCF and Adaptation Fund projects helps to mainstream TNA outcomes in overarching national strategies and programmes for climate and sustainable development. Linking these processes can help in broadening the community for implementation of TNA-prioritized technologies; harmonizing the processes so that TNA outputs can be inputs to the other processes, and vice versa, so that efficiency gains can be achieved, such as avoiding duplicated work on data gathering and analysis; and avoiding stakeholder fatigue as the processes are participatory and invite inputs from similar (types of) stakeholders. Moreover, linkages with, for example, NDCs and NAPs would make TNA-prioritized technology options eligible for a wider range of funding and thus implementation. Hence the TNA institutional structure can be aligned with an existing climate committee, such as a group set up for drafting the NDC;
- (c) In relation to enhancing capacity-building, countries are invited to consider work under other processes and of constituted bodies under the Convention, including the Paris Committee on Capacity-building, aimed at addressing current and emerging capacity gaps and needs and enhancing capacity-building in developing countries. Developing national capacity to implement climate technology activities has been identified as a need by several developing and least developed countries;
- (d) Developing pilot projects is a good way to demonstrate technology options, with financial support from multilateral funding programmes and development partners and technical support and advice from the CTCN (training, and help with developing pilots and writing concept notes for funding proposals);
- (e) It is considered good practice to engage possible funders of TAP activities early in the TNA–TAP process so that country stakeholders are aware of what funders are willing to finance and to avoid mismatches between countries' and funders' priorities. It is recommended particularly to engage in-country donors and national focal points of international climate finance mechanisms for the TNA to become a collaborative process, leading to higher chances of funding and implementation;
- (f) Clarity on ownership among the key stakeholders increases the chance of implementation of TNA results. While the TNA process itself is often coordinated and 'owned' by a ministry of environment, it is good practice to discuss from an early stage who will take responsibility for TAP implementation. This could be a specific line ministry, but there are also good practice examples of governmental working groups taking responsibility for implementation beyond completion of the TNA process;
- (g) Considering TNA-prioritized technology options in proposals submitted to the GCF;
- (h) Equipped and trained TNA champions are key to continuing projects beyond the TNA process.



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Recommendations for enhancing implementation of results of technology needs assessments

(a) Domestic

Developing countries may wish to consider promoting their TNA results domestically with a view to enhancing their implementation. The TNA results may be shared with stakeholders involved in mitigation- and adaptation-related processes and activities, including NDCs and NAPs. Experts from relevant bodies, such as ministries of finance, representatives of regional development and energy and economy, national designated entities, national designated authorities and others could be introduced to domestic TNA results as an opportunity to build on them and hence leverage their implementation potential.

Governments have a major role to play in creating an enabling environment for technology development and transfer by strengthening legal and regulatory frameworks for international technology development and transfer and foreign financial flows, including introducing market-based instruments for market development.

An enabling environment for technology development and transfer is often characterized by effective coordination and communication among government departments and agencies, with the goal of streamlining and facilitating investment in technologies and presenting an integrated approach to international technology development and transfer efforts at the national and subnational level.

Well-selected project development teams and identified relevant decision makers are key pre-conditions for successful TNA preparation and implementation of results.

The latest TAP guidance includes a step for tracking implementation of results after TNA completion, but the challenge remains to incentivize country stakeholders to allow others to keep track of their implementation results.

Tracking implementation of TNA results is included not only as a final step in TAP development, but also as an issue to be discussed at the start of the TNA process. Country stakeholders can discuss existing monitoring systems in which tracking TNA results could be included (e.g. NDC monitoring requirements under the Paris Agreement) or identify the need for capacity-building for tracking. Another reason for tracking implementation results is that it can help to streamline the process of iterative TNAs, in which a country decides to review or repeat the TNA process.

(b) Regional

Regional promotion of lessons learned, success stories and challenges in relation to implementation of climate technologies could be beneficial for countries in the same region with similar enabling environments and capacity levels, as it could enable replication of good practices in piloting and deploying technology-related activities and thus support enhanced implementation of climate technologies.

Under the global TNA project, dozens of countries have completed or are currently working on a TNA. This presents a great opportunity for exchanging experience of the TNA process and post-TNA implementation. In the current set-up, TNA coordinators and consultants meet each other at regional TNA workshops. Supplementary to this could be a programme in which TNA coordinators or working groups learn from a country that undertook a TNA in a previous phase, for example through site visits. TNA experts involved in previous phases have already been involved in workshops and training in phase III of the global TNA project, which has enabled enhanced cooperation and learning from experience.

(c) International

International cooperation on meeting technology needs will enhance implementation of TNA results. Countries' technology needs may be met with the support of international funding and investment stakeholders with extensive experience in financing climate mitigation and adaptation action.

(d) Financial

Availability of and access to financial resources are among the main identified barriers to technology development and transfer in developing countries, including the least developed countries and small island developing states. Further promotion of implementation plans and activities may stimulate the interest of financial institutions and stakeholders in investing in climate technologies.

In their TNAs, developing countries identified the need for a combination of market stimulation and human capacity development for advancing the transition to improved enabling framework conditions for technology development and transfer. Supporting programmes aimed at strengthening the institutional and scientific capacity of developing countries, in particular the

least developed countries, is critical for creating the long-term enabling frameworks required for technology development and transfer.

In addition to actively involving donors and financial experts in the TNA process, a 'donor conference' can be organized as a final step in the TNA process, which is now planned for phases III–IV of the global TNA project. In this context, it is recommended to demonstrate actual TNA results and success stories, as this builds trust and confidence among potential public and private sector funders. Keeping track of implementation results in relation to TNA-prioritized technologies would support this.

(e) Private sector

In developing countries, the markets for climate technologies are rapidly expanding and hence creating new opportunities for international exports and for domestic production and joint ventures across borders. Familiarizing the private sector with TNA implementation plans and engaging it in project preparation teams may enhance interest in the country's implementation activities. Private sector efforts may also be stimulated by the availability of national support mechanisms and instruments focusing on both mitigation and adaptation action.



Abbreviations and acronyms

CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
COP	Conference of the Parties
CTCN	Climate Technology Centre and Network
DTU	Technical University of Denmark
GCF	Green Climate Fund
GEF	Global Environment Facility
NAMA	Nationally Appropriate Mitigation Action
NAP	National Adaptation Plan
NDC	Nationally Determined Contribution
TAP	Technology Action Plan
TEC	Technology Executive Committee
TNA	Technology Needs Assessment
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme





About the Technology Executive Committee

The Technology Executive Committee is the policy component of the Technology Mechanism, which was established by the Conference of the Parties in 2010 to facilitate the implementation of enhanced action on climate technology development and transfer. Along with the other component of the Technology Mechanism, the Climate Technology Centre and Network, the committee is mandated to facilitate the effective implementation of the Technology Mechanism.

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