



Technology Executive Committee

05 September 2023

Twenty-seventh meeting

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Draft gap assessment of guidance on TNAs

I. Background

1. At TEC 26 the TEC considered a draft concept note by the secretariat on updating guidance on TNAs and provided guidance for further work on this matter. The TEC agreed to modify the draft concept note in accordance with the guidance provided. The TEC also agreed to undertake a gap assessment of guidance on TNAs to be considered at its next meeting with a view to informing the decision of the TEC on how to proceed with updating the guidance.
2. The TEC requested the open-ended activity group that will support the implementation of this activity to continue the work on this matter, taking into account the guidance provided.
3. As per activity B.1.1. of the rolling workplan, the TEC is to prepare a gap assessment of guidance on TNA.
4. At TEC 27, the co-lead(s) of this activity group will present the draft gap assessment of guidance on TNAs, to inform the discussions of the TEC on how to proceed with updating the guidance.

II. Scope of the note

5. The annex to this note contains a background note to assess the gap of guidance on TNAs.

III. Expected action by the Technology Executive Committee

6. The TEC will be invited to consider the draft gap assessment of guidance on TNAs and provide guidance to the activity group for further work on this matter.

Annex

Draft gap assessment of guidance on TNAs

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1 Background

The need to carry out an assessment of the TNA guidance at this time arose from discussions in the TEC, see TEC/2022/25/5. The TEC included in its rolling workplan 2019–2022 an activity to consider updating the TNA guidelines, building on previous work of the TEC, with a view to TNAs leading to enhanced implementation. Workstream 2 of the TEC rolling workplan 2023-27 includes provision to facilitate an update of the TNA, enhancing implementation of TNA results, and promoting links between TNAs, NDCs, NAPs and their NDCs. This is outlined in two expected activities: (i) gap assessment of guidance on TNA and (ii) an event with financial actors to raise awareness on TNA for the year 2023. The present draft contributes to the first activity.

The TEC should consider the need to revise TNA guidelines considering COP/CMA guidance on that matter, including 15/CMA.1, Annex paragraph 12 c; 1/CP.21 para 67 a, 67 b, and SBI/2022/L.10 para 4. The present gap assessment is being carried out to inform this process.

1.1 History of the TNA process and overall objective of TNAs

Technology needs assessments (TNAs) are a long-standing process under the UNFCCC and more than 100 developing countries have undertaken TNAs to assess their technology needs to address climate change. Assuming, 4-6 sectors per country (adaptation and mitigation) and 3 technologies per sector, this corresponds to over 1500 individual Technology Action Plans (TAPs).

In May 1999, the GEF council, with the view to comprehensively respond to the capacity building needs of non-Annex I Parties under the UNFCCC beyond support for the preparation of initial national communications, approved a shorter, medium, and longer-term plan to build the capacity of these countries to implement the UNFCCC Convention. Eligible countries wishing to utilize the initial and expedited opportunity, were requested to select their preferences, and opted for identification/submission on technology needs, and capacity building to assess technology needs, modalities to acquire and absorb them, design, evaluate and host projects.

To ensure continuity with the earlier enabling activity as well as maintaining and enhancing capacities already built within the framework of preparing the first national communications, recipient countries were expected to use the same institutional structure and personnel that were involved in the preparation of the first national communications. The GEF provided funding for each of the 92 non-Annex I Parties to conduct the TNAs through its interim financing for capacity building in priority areas – enabling activities (also known as “top-ups”).

The concept of the TNA was formalized under the UNFCCC process in 2001, when the Conference of the Parties (COP) 7 in Marrakesh established the technology transfer framework. One of the originating themes of the framework is the TNA. TNA was initially intended to be covered by the “top-up” phase designed to continue to build capacity in countries and maintain the momentum built as a result of the initial national communication exercise.

UNDP served as implementing agency and supported 78 top-ups through 69 GEF funded projects. These projects addressed technology transfer activities as key priority under the top-ups. UNEP served as implementing agency for 14 countries. The TNAs evolved to become central to the work on technology transfer. They follow a country-driven approach, bringing together stakeholders to identify needs and develop plans to meet those needs. They defined their scope and target audience to ensure a more focused analysis and avoid unreasonable expectations from this reporting process, with implementation stage often well drafted (technology action plans) but not financially supported.

The TNA process has constantly evolved and may be broken into two distinct rounds or “generations”. Between 2001 and 2008, the first generation of TNAs focused on supporting developing countries to develop a clearer understanding of their technological needs and priorities for reducing greenhouse gases and adapting to climate change. The Global Environment Facility (GEF) provided financial support for these TNAs, with the United Nations Environment Programme (UNEP) and the United Nations Development Programme (UNDP) as the implementing agencies for supporting the country projects.

The second generation of TNAs commenced in 2009 and continues until the present. This second generation of TNAs has placed a greater emphasis on implementation, on supporting countries to translate their identified technology needs into implemented projects and programmes. In this way, the TNA process evolved to have three broad benefits. It supports developing countries to:

- Identify technological means to address climate change and accelerate national development
- Build national capacity to support national sustainable development
- Create technology action plans to achieve implementation and demonstrate technology viability

1.2 COP, CMA decisions and SBI conclusions

Commitments to promote technology transfers to developing countries have been renewed at every Conference of the Parties (COP) to the Convention. The concept of TNAs was formalized during the UNFCCC process in 2001 under the technology transfer framework established at COP 7 in Marrakesh, the TNA process has evolved into two rounds, with the initial phase (2001-2008) aimed at helping developing countries understand their technological needs for greenhouse gas reduction and climate adaptation, supported financially by the Global Environment Facility (GEF) and implemented by the United Nations Environment Programme (UNEP) and the United Nations Development Programme (UNDP). The second round of TNAs commenced in 2009 and continues until present. Support for TNAs in this round has come through GEF's Poznan Strategic Programme on Technology Transfer. This GEF programme has funded TNA global projects implemented by UNEP in partnership with the Technical University of Denmark (this partnership is known as UDP), and currently by the UNEP CCC.

The TNA Global Project, initiated in 2009 and continues until present, has placed a greater emphasis on implementation, on supporting countries to translate their identified technology needs into implemented projects and programmes. In this way, the TNA process evolved to have three broad benefits. The process has been offering support to developing countries identify climate-change-related technologies for both national development and sustainability, strengthening their national capacity, and formulating technology action plans to facilitate implementation and demonstrate technology viability.

The TNA global project phase I ran from 2009 to 2013, with 36 developing countries participating. Between 2015 and 2018 the UDP implemented the GEF-funded TNA Global Project, phase II, which provided financial and technical support to 26 countries to conduct TNAs. Countries submitted their reports in 2018. In 2016, the GEF Council approved a TNA Global project, phase III, to support a further 23 developing countries from Small Island Developing States (SIDS) and Least Developed Countries (LDCs). This project started in 2018. Phase IV of the global TNA project was approved by the GEF in June 2019 and included more than 15 LDCs and SIDS.

In 2010, this level of commitment led to the establishment of the Technology Mechanism, in the form of the Technology Executive Committee and the Climate Technology Center and Network (CTCN), which aims to 'facilitate enhanced action' on technology development and transfer in order to support progress on climate change mitigation and adaptation. The Paris Agreement of 2015 highlights the importance of technology in implementing both mitigation and adaptation actions under the Agreement. The Technology Mechanism should facilitate and promote enhanced action on technology to help countries achieve the goals of the Paris Agreement, while at the same time recognizing the importance of rapidly accelerating transformational changes towards climate resilience and reduced greenhouse gas emissions. Based on a COP21 mandate, in December 2018 the parties at COP24 completed the drawing up of a new Technology Framework to guide the Technology Mechanism. The Technology Framework placed increased emphasis on TNAs and their role in promoting and facilitating enhanced actions on technology development and transfer. It also gave TNAs a central role in the implementation of climate mitigation and adaptation technologies.

1/CMA.15, Annex, paragraph 12 c – technology framework, thematic area implementation, actions include activity to review the TNA guidelines and updating them as necessary with a view to TNAs leading to plans and implementation that are aligned with the transformational changes envisioned in the Paris Agreement.

The COP 21 requested the Subsidiary Body for Scientific and Technological Advice to initiate, at its forty-fourth session (May 2016), the elaboration of the technology framework established under Article 10, paragraph 4, of the Agreement and to report on its findings to the Conference of the Parties, with a view to the Conference of the Parties making a recommendation on the framework to the Conference of the Parties serving as the meeting

of the Parties to the Paris Agreement for consideration and adoption at its first session, taking into consideration that the framework should facilitate, inter alia: (a) The undertaking and updating of technology needs assessments, as well as the enhanced implementation of their results, particularly technology action plans and project ideas, through the preparation of bankable projects; (b) The provision of enhanced financial and technical support for the implementation of the results of the technology needs assessments. SBI 56 invited the TEC, in consultation with the CTCN and the operating entities of the Financial Mechanism to consider, when updating the guidelines for TNAs, how developing countries can be supported in updating their TNAs and implementing their technology action plans and TNA outcomes.

1.3 Methodology and scope

Following guidance from the TEC, this paper was developed using a variety of sources, listed below, which contain recommendations for the TNA process.

Terminal Evaluations of TNA Phase I and II. Terminal evaluations of the TNA I and TNA II projects have been carried out (UNEP Evaluation Office, 2016) and (UNEP Evaluation Office, 2020). The recommendations from the evaluations, and responses to them, are shown Annex II. Many of these recommendations from the evaluations have already been implemented in the TNA methodology and process.

TNA synthesis reports. The UNFCCC Secretariat is synthesizing and compiling the TNA reports of countries, and indicating several success stories, lessons learned, and challenges.

Feedback from participating countries. As part of the Global TNA project, participating countries submit “final activity reports” which summarize the main elements of the country TNA and, specifically, allowed for comments and recommendations on the TNA methodology, guidance material, country support, and capacity building. Comments have been extracted and compiled from these final reports for TNA III completed in March 2023, and are presented anonymously in Annex I under relevant topic headings, addressing general and specific methodological issues, and revision of the guidance material.

Feedback from the operating entities of the UNFCCC Financial Mechanism, GEF and GCF, to collect feedback and views on how the TNA process and its outcomes can be improved to attract further financial resources for implementation.

Desk review of TNA guidance material, assessing any needs for updates, for example missing information on new processes under the Convention such as LT-LEDS, current gaps in the methodology and information available to countries.

Reviews of previous TEC work that has looked into TNA/TAP implementation efforts.

A review of existing implementation efforts after TNA project closure in countries. Information is available in a series of success stories brochures which share information of around 50 implementations of climate technology projects in developing countries, building upon TNAs/TAPs.

Consultations with CTCN. The CTCN supports countries to develop their TNA and TAP, mainly utilizing GCF Readiness, and is mandated to support implementation of TAPs. CTCN’s approach to supporting countries conducting TNAs builds on the main methodology developed under the Global TNA project but emphasises that each of the TNAs would be different in line with what the country wants. Some distinct features of the CTCN supported TNAs include:

- 1) Preselection of the sectors and the subsectors deriving from the NDC and the NAP documentation
- 2) Detailed assessment of the market for technology to be prioritized.
- 3) Focus on SMEs and developing national systems and institutions.
- 4) Detailed concepts note in line with GCF modalities.
- 5) Development of market-based mechanism for specific technology

No distinct TNA guidance documents are made available through the CTCN.

2 Assessment of TNA guidance

In summary, existing TNA guidance is developed under the Global TNA project. Therefore, the current paper focuses on the guidance material produced under the GEF-funded Global TNA project, with information incorporated from stakeholders outside the Global TNA project wherever possible.

2.1 Evolution of the TNA guidance

The TNA guidance has evolved from the original three TNA Handbooks prepared in 2001–2009, which mainly focused on technology prioritization, stakeholder engagement, and project ideas, to a methodology that provides in-depth guidance on how to identify barriers and enablers for technology transfer and diffusion, markets potentials, the development of TAPs, and the preparation of project concept notes (2020). Figure 1 illustrates how the TNA approach, methodology and guidance material has developed in response to and in the context of COP decisions. Enhancing the TNA process and the implementation of TNA results has been a key focus of the UNFCCC since COP 7. In 2002, the Climate Technology Initiative (CTI) developed the first TNA handbooks. Working with key stakeholders (including countries, the UNFCCC secretariat, UNDP, and UNEP), the document sought to provide developing and transition countries with a summary of methods for conducting climate change technology needs assessments and implementation activities.

In 2004, the UNDP prepared the second TNA handbook ‘Conducting Technology Needs Assessments for Climate Change’ built on the CTI handbook to provide ‘user-friendly’ guidance on approaches, methods, and tools that can be used to conduct a TNA, expanding heavily on the stakeholder engagement process. In 2010, consistent with the greater focus on TNA implementation, UNDP, the UNFCCC and the Expert Group on Technology Transfer produced an updated TNA handbook designed to assist countries in making informed decisions in their technology choices. For the first time, the guidance contained some information on preparing action plans and project ideas for implementation of prioritized technologies.¹

¹ UNDP TNA Handbook (2010)

http://www.undp.org/sites/g/files/zskgke326/files/publications/Technology_Needs_Assessment_Handbook.pdf.

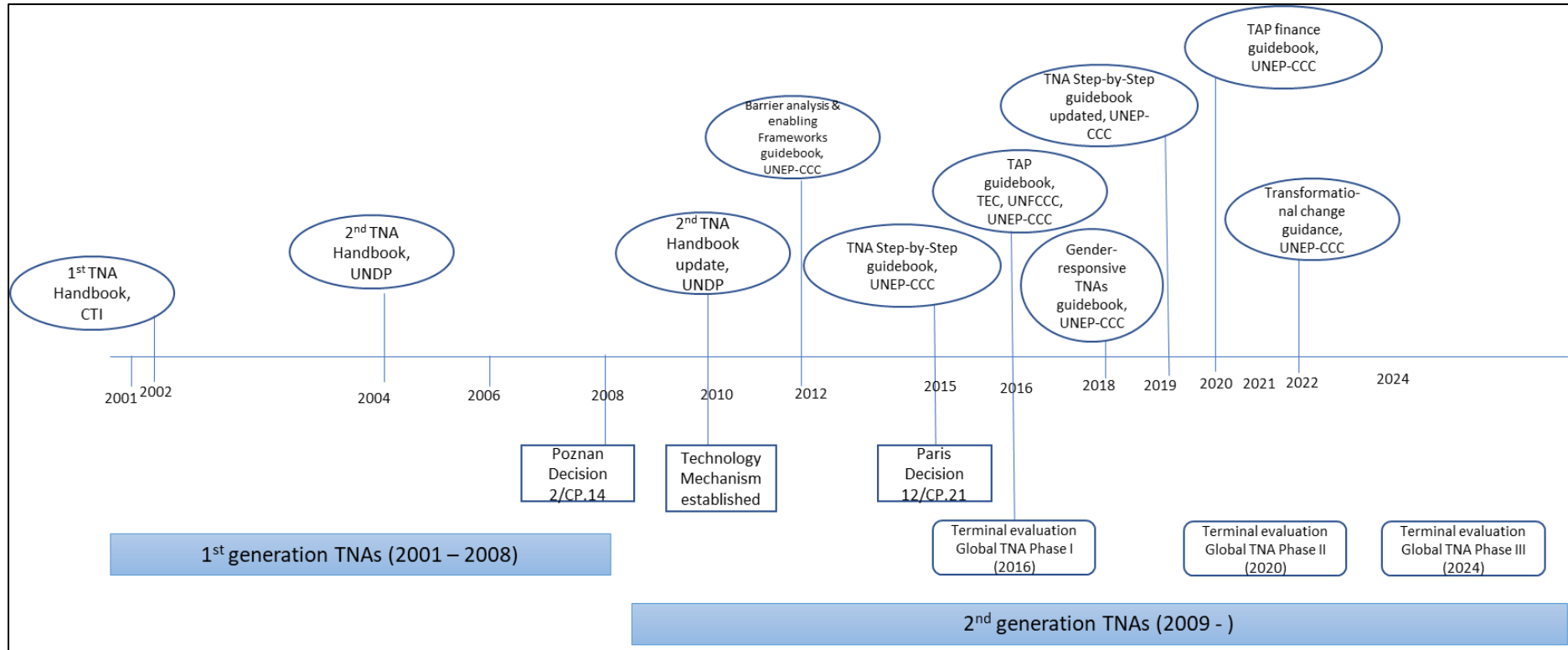


Figure 1 Timeline of TNA development and COP decisions

2.2 Current TNA guidance

The current TNA methodology emphasizes capacity building, national ownership, and implementation avenues. The organization of the process in each country is critical for ensuring both that the process is followed. Results must reflect the national priorities. Sustainable capacity and strengthened institutions are essential so that follow-up activities can address other sectors and more technologies, with regular updates as conditions change. While other modalities, for example relying mainly on external consultants, are also used, there is still a requirement for national ownership. Regular involvement of stakeholders and policy makers is essential, with national approval of outputs through the process.

The guidance materials are also being continuously reviewed and improved (this is similar to the improvement of training materials, but also includes the revision of existing guidebooks, development of new guidebooks and development of e-modules) by the TNA global project executing agency, UNEP-CCC.

The funding level per country has been increased over the years, justified by the recognition that more capacity building, and notably in-country capacity building, is beneficial to the TNA process. This was highlighted in the Terminal Evaluation of TNA Phase I and was accepted by the GEF in subsequent phases of the Global TNA project.

An overview of the main guidance documents is provided in table 1, with the main guidance being the ‘TNA Step-by Step guidebook’.

The three steps of the TNA process, as the methodology is currently built around, are illustrated in Figure 2. Proposal development and implementation are guided by the results of the TAPs – the project ideas and concept notes – but are beyond the scope of the actual TNA process.

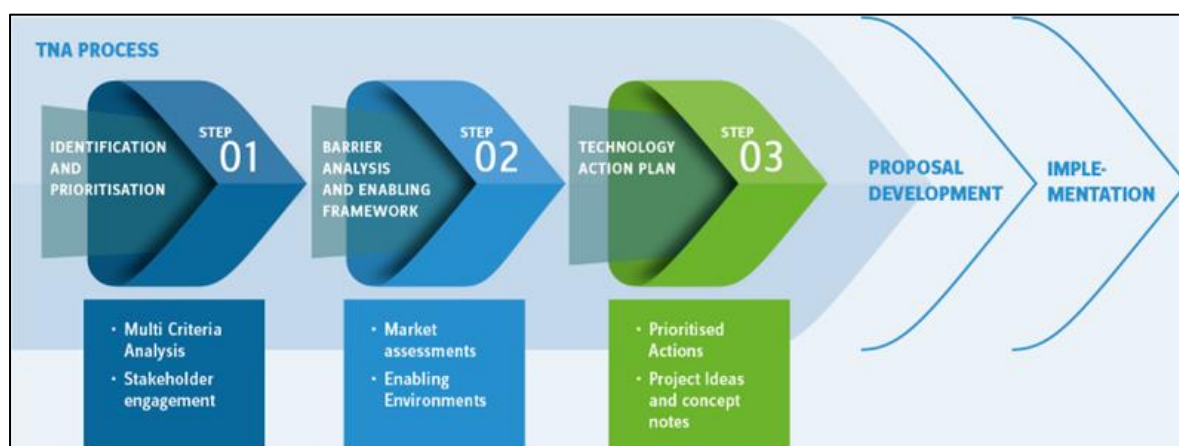


Figure2 The three main steps in a TNA process: from priorities to action

2.2.1 Step 1: Sector and technology identification and prioritisation

Sector selection

The selection of priority sectors for both adaptation and mitigation was an important part of the TNA process in the initial TNAs, pre-Paris Agreement (PA) and before the NDCs. In those early TNAs, the priority sectors were selected through a stakeholder consultation process. The justification for selecting a few key focus sectors, typically two or three each for adaptation and mitigation, was the limited budget resources available for each country project, and the need to go in sufficient depth of analysis. A similar argument is valid for the prioritisation of technologies within each sector.

In the post-PA era, with NDCs indicating country priorities, the selection of priority sectors is more a given, though a certain narrowing-down to two or three sectors may still be necessary. In many cases the key sectors selected are energy and transport (mitigation) and agriculture and water (adaptation), though coastal zones (adaptation) and waste (mitigation) are also frequently considered. It is assumed that additional key sectors may be addressed through supplementary projects or by national resources and local capacity based on capacity built through the initial TNA project.

Technology prioritisation

Prioritization needs to be done in order to identify the priority technologies in each sector that are to be carried further to the second and third steps. This prioritization is done using multi-criteria analysis (MCA) for which guidance material is available in two separate guide notes on adaptation² and mitigation.³

The overall methodology for technology prioritization is summarized in the Step-by-Step guide. This involves identification of the long list of relevant technologies within each sector, identifying criteria for the MCA, assigning weights of importance to each criterion, scoring, determining the order of priority, and sensitivity analysis. By varying the weights assigned to certain criteria, in particular climate impact, the robustness of the ranking can be explored to reveal any possible bias.

Issues in this process that require particular care are the number of criteria and the potential overlap or unintended duplication of certain criteria. In principle, criteria should be effectively “orthogonal” (independent) in mathematical terms, so they do not measure the same, or nearly the same attribute. This is often difficult to recognize in practice. Experience has shown that country teams often choose a larger than necessary set of criteria, covering many characteristics of technologies and their place in the system, with a consequent risk of redundancy or overlapping, as well as a high degree of subjectivity making the criteria difficult to estimate. In addition, the climate dimension, whether mitigation or adaptation contribution, is often under-represented. This could result, in principle, in technologies being prioritised which have significant developmental advantages but relatively little climate impact. Close monitoring of the process by experienced practitioners could help avoid these pitfalls, and this is an important part of the training in the first regional workshop in the form of a “training of trainers” process. Thus, the national consultants are tutored in the MCA process that they will subsequently carry out with the relevant sectoral working groups.

2.2.2 Step 2: Barrier analysis and enabling framework (BAEF)

The second step in the TNA process, the BAEF, is summarized in the Step-by-Step guidebook, and fuller details are provided in the “Barrier Analysis Guidebook”.⁴ The key steps in the barrier analysis are:

1. Identify all possible barriers through a literature survey, interviews and/or workshop brainstorming
2. Screen the long list of barriers to select the most essential ones
3. Classify the selected essential barriers into a hierarchy of categories

A key requirement for a meaningful barrier analysis is to have clear and well-defined technologies. The more specific and well-defined they are, the better the barrier analysis will be. For example, “solar energy” comprises several different technologies that differ both with regard to type of energy output (heat or electricity) and the scale of application, from pico-solar for lanterns to large grid-connected applications. Moreover, there are essentially two distinct types of solar electricity generation in use: photovoltaic (PV) and concentrating solar (CSP). These have vastly different market structures and potential barriers, each requiring in-depth analysis. A further common mistake that countries make at this stage is to offer only a superficial analysis of the most obvious barriers, such as ‘high capital costs’, without going on to explain at greater depth what exactly are the cost differences and why they arise.

The Barrier Analysis Guidebook goes on to describe how the identified barriers can be tackled by measures to overcome them. The detailed analysis should have clarified the nature of the barriers and their interrelations, which itself helps indicate what measures may be necessary. Sets of complementary measures may be used to enhance their impact, and different sets of measures to achieve the same goal may have different economic and other impacts. It is therefore recommended to discuss the measures at the highest political level before selecting a set of measures to be included in the TAP.

² UDP (2015a). Evaluating and prioritizing technologies for adaptation to climate change: a hands-on guidance to multi-criteria analysis (MCA). UNEP DTU Partnership, Copenhagen.

³ UDP (2015b). Identifying and prioritising technologies for mitigation: a hands-on guidance to multi-criteria analysis (MCA). UNEP DTU Partnership, Copenhagen. UDP and Libélula (2015). Identification and Engagement of Stakeholders in the TNA.

⁴ Nygaard, I. and Hansen, U. (2015). Overcoming Barriers to the Transfer and Diffusion of Climate Technologies: Second edition. UNEP DTU Partnership, Copenhagen.

2.2.3 Step 3: Preparing Technology Action Plans (TAPs), Policy Briefs and Concept Notes

Technology Action Plans

The final step in the TNA process is the preparation of a TAP to support the implementation of the prioritized technologies on the desired scale within the country to achieve the climate and development benefits as identified earlier in the TNA. Concretely, the TAP should be based on the measures already identified in the BAEF step for overcoming the barriers to technology implementation, and it specifies how to implement these

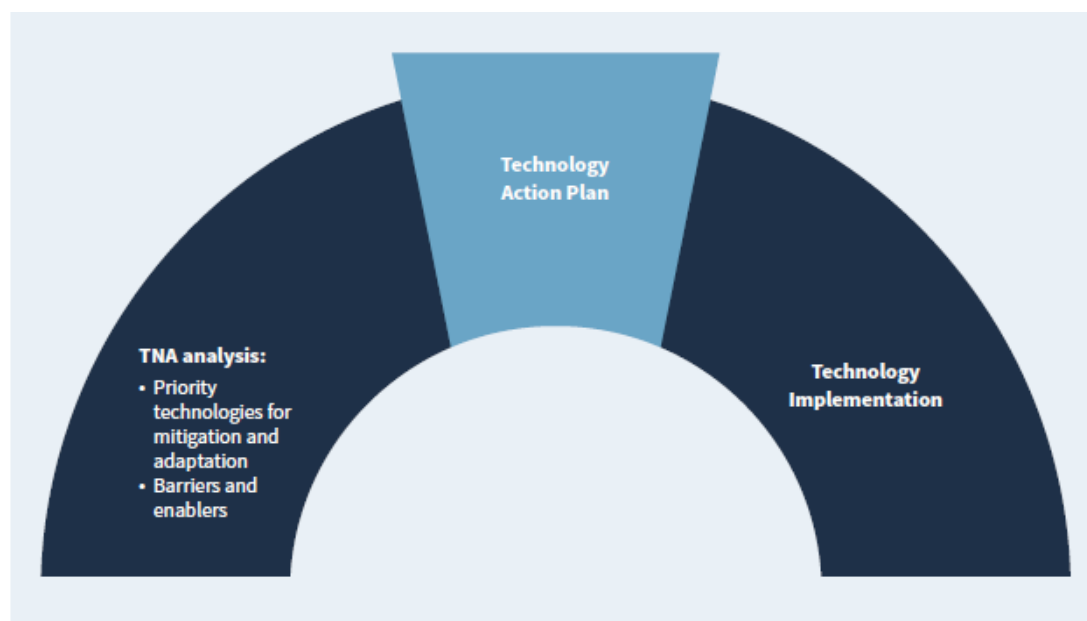


Figure 3 TAPs as the "keystone" between TNA analysis and technology implementation (UNFCCC TEC and UDP 2017)

measures, including who is responsible, when and from where for securing funding. As such, a TAP serves as a bridge between the analysis of the prioritized technologies and their implementation (Figure 3). The actions in a TAP can take different forms. For example, an action can be a technology demonstration project, with the aim of overcoming public opposition to that technology. Another example of an action could be a programme to train local engineers in order to address the barrier of a lack of the skills needed to operate a specific technology. An action could also aim to overcome indirect barriers to technology uptake or diffusion, with associated co-benefits, such as the provision or upgrading of infrastructure.

Guidance for preparing Technology Action Plans was issued in 2017⁵ and summarized as part of the Step-by-Step Guidebook.⁶

Policy briefs

As a new feature beginning with TNA Phase III (2018), participating TNA countries have been required to prepare Policy Briefs for each technology included in the TAPs. The briefs are aimed at a general audience and summarise the policy relevant actions within the TAP in a short document that can be shared with the policy makers. They are intended to provide balanced information for the policymaker to make up his or her mind to move forward with the preparation of programmes and policies to support TAP implementation. TNA teams are provided with a short guidance document and a template to prepare the policy briefs. The exercise has proved to be successful, and essentially all country teams completing the TAPs have prepared briefs for the prioritized technologies.

⁵ UNFCCC/UDP (2017) Enhancing Implementation of Technology Needs Assessments – Guidance for Preparing a Technology Action Plan. UNFCCC Secretariat and UNEP DTU Partnership, Copenhagen.

https://unfccc.int/tclear/misc/_StaticFiles/gnwoerk_static/TNR_HAB/33b283a23cec442abf8c04e734bc545a/bbd4572425c84815834512ebddf13964.pdf.

⁶ <https://tech-action.unepccc.org/wp-content/uploads/sites/2/2019/04/2019-02-tna-step-by-step-guide.pdf>.

Concept notes

From TNA Phase III (2018), the TNA process has included a component to support the development of a Concept Note targeting a financing entity such as the GCF. Concept Note guidance and training is provided to national TNA teams. The support built to a great extent on the existing GCF concept note guidance and template, and reinforced by a new finance guidebook⁷ developed during the TNA III period. In addition to the experience from TNA III, a number of separate targeted national concept note development activities were carried out through a small technical assistance programme by CTCN, as a follow up to countries' TNAs/TAPs. These included Jordan, Guyana, Tanzania, Zambia, and Zimbabwe. Typically, 4-5 concept note ideas were developed by local teams on the basis of an intensive training workshop covering key aspects of concept notes, followed by a period of several months in which support was provided in finalizing the draft concept notes. Although the results were not systematically monitored, some lessons can be incorporated in future support for concept note development.

⁷ Canu, F. A., Pedersen, M. V., Hinojosa Garza, J., Trærup, S. L. M., Dhar, S., & Jehl Le Manceau, L. (2020). Finance Guide for Implementation of Technology Action Plans. UNEP DTU Partnership. TNA Guidebook Series.

Table 1: Overview of the existing TNA guidance – and suggestions for updating and new guidebooks

<i>TNA Process Step</i>	<i>Main Guidance and tools</i>	<i>Comments</i>
Cross-cutting guidance for main steps		
	TNA Step by Step (2019)	Main guidebook. The TNA Step by Step document, updated at intervals, should remain the main concise and easily readable guidance documents. The electronic version would contain links to the relevant specific guidance documents. Could be updated to incorporate Concept Notes, Policy Briefs, addressing Transformational Change, Gender and Youth issues at all steps, coherence with stakeholder guidance (document 2). Incorporate hyperlinks to all specific guidance.
	Identification and Engagement of Stakeholders in the TNA Process (2015)	Could be updated to incorporate latest developments (NDCs, NAPs, LT-LEDS, NDEs and NDAs, etc.) Reinforce gender aspects at all steps in the process.
	Guidance for a gender-responsive Technology Needs Assessment (2018)	Not required.
	Transformational Change Guidance for technology Needs assessment (2022)	Not required.
	The role of TNAs and TAPs in preparing and implementing Long-Term Strategies	Not available. Could be a new guidebook. Suggested in UNFCCC background paper TEC/2022/25/5.
Step 1: Technology Prioritisation	Identifying and prioritising technologies for climate change adaptation (2015)	Could be updated with suggestions for simplification to avoid duplication of criteria, recommending inclusion of TC, contribution to NDCs, NAPs, gender issues, etc. in criteria.
	Identifying and prioritising technologies for mitigation (2015)	Update with suggestions for simplification to avoid duplication of criteria, recommending inclusion of TC, contribution to NDCs, gender issues, etc. in criteria.
Step 2: Barrier Analysis & Enabling Frameworks	Overcoming Barriers to the Transfer and Diffusion of Climate Technologies (2015)	Could be updated, incorporate reference to NDCs, NAPs, TC, Gender Issues.
Step 3: Technology Action Plan (including project ideas)	Enhancing Implementation of Technology Needs Assessments – Guidance for Preparing a Technology Action Plan (TAP) (2017)	Update is not strictly required but could be updated to address Transformational Change and Gender issues.
Step 4: Project Concept Note / Finance Guidebooks	Accessing International Funding for Climate Change Adaptation (2012)	Financial landscape has evolved, and guidebook has become outdated. However, many other sources available online.
	Accessing International Financing for Climate Change Mitigation (2012)	Financial landscape has evolved, and guidebook has become outdated. However, many other sources available online.

<i>TNA Process Step</i>	<i>Main Guidance and tools</i>	<i>Comments</i>
	Finance Guide for Implementation of Technology Action Plans (2020)	Not required.
	Involving the private sector – a practical guide	Not available. New practical guide could be developed
TNA Sector Technology Guidebooks		
Adaptation		
	Water (2011)	Update if important technological developments are missing. However, information on available technologies evolves and there are online resources available elsewhere.
	Agriculture (2011)	Update if important technological developments are missing. However, information on available technologies evolves and there are online resources available elsewhere.
	Coastal zone (2010)	Update if important technological developments are missing. However, information on available technologies evolves and there are online resources available elsewhere.
Mitigation		
	Transport (2011)	Update if important technological developments are missing. However, information on available technologies evolves and there are online resources available elsewhere.
	Buildings (2012)	Update if important technological developments are missing. However, information on available technologies evolves and there are online resources available elsewhere.
	Agriculture (2012)	Update if important technological developments are missing. However, information on available technologies evolves and there are online resources available elsewhere.
	Energy	Not available. New guidebook could be developed.
Cross-cutting		
	Urban contexts (2021)	Not required
	Indigenous Peoples and Climate Technologies (2021)	Not required

3 Stakeholders

3.1 National TNA stakeholders

Overall, national TNA teams should collaborate closely with the teams in charge of the NDC process, National communications preparations, NAPs, and other relevant processes. Institutions and stakeholders such as Ministries of Finance and Planning, business associations, financial institutions, academia/research institutions and donors/development partners should be involved in the TNA process. The current TNA methodology, recommends that effort is made to involve relevant decision makers, donors, and development partners, financial institutions, and business representatives.

Stakeholder engagement and involvement in the national TNA process is pivotal to country relevance and ownership. As deliberated in a previous TEC paper,⁸ countries have long encouraged the adoption of practices that promote the participation of stakeholders in consultations and decision-making processes related to the Convention and its Protocols. The Operating Entities have reflected its pivotal importance by establishing their own policies and guidance, as well as setting requirements for their implementation intermediaries' policies, procedures and capabilities related to stakeholder engagement. The GEF positions effective public involvement as "critical to the success of GEF-financed projects"⁹ and a key strategic lever to mitigate operational risk and tap the financial and non-financial resources of the private sector. Collaborating with multi-stakeholder platforms is seen as essential to transform markets and economic systems at the scale required to drive the uptake of low-carbon and climate-resilient solutions.

The TNA process is conducted through a stakeholder driven approach led by the national TNA Coordinator in collaboration with the national consultants. A wide range of stakeholders should be consulted, including the involvement of working groups. The TNA team can come out with policy recommendations but if those are to be implemented, they need to be vetted by policy makers, who constitute the National Steering Committee.

For TNA guidance on stakeholder engagement, a guidance is available and recommends some approaches, methods, and the diverse types of stakeholders to engage with throughout the TNA process.¹⁰ This includes how to handle the issue of "stakeholder fatigue" or "workshop fatigue", associated both with multiple meetings within the same project, and meetings and workshops in related projects that are attended by the same stakeholders. Such fatigue can be a major problem in any project, including during a TNA project, resulting in reduced engagement or interest as the project goes on.

A similar issue with regard to stakeholder involvement is the lack of continuity of stakeholder involvement, where particularly ministerial representatives can be assigned to participate in workshops or meetings with little project knowledge or experience. Ensuring that the same stakeholders are engaged throughout the project is a major challenge that is difficult to meet except through the targeted engagement of the national coordinator and the host organisation.

At the national level, the involvement of stakeholders from civil society, i.e. beyond the usual sectoral institutions, is the responsibility of the national TNA coordinator and the consultants. The TNA stakeholder guide recommends the inclusion of various civil society entities, and there is a dedicated TNA guidebook on Indigenous Peoples and climate technologies.¹¹ The relevance and timing of such engagement is an important part of the initial stakeholder mapping. It should be emphasised in the initial training workshops, along with the other important aspects of stakeholder engagement, see point above under general.

⁸ UNFCCC TEC (2022) TEC/2022/24/9.

⁹ GEF's (2021) Report to the GEF.

¹⁰ <https://tech-action.unepccc.org/wp-content/uploads/sites/2/2019/05/identification-and-engagement-of-stakeholders-in-the-tna-process-a-gui-3.pdf>.

¹¹ <https://tech-action.unepccc.org/wp-content/uploads/sites/2/2021/09/2021-06-tna-indigenous-people-web.pdf>.

When countries are setting up their TNA process, they should ensure that there is a good gender balance in the TNA team, consider what roles are fulfilled by men and women respectively in the TNA process, and how might this affect outcomes. The gender expertise from the country team will ensure that gender targets are met nationally. Selecting team members with knowledge of gender equality issues is therefore a crucial first step to mainstreaming gender in the TNA. A TNA guidebook, which was developed under TNA Phase III on how to undertake a gender-responsive TNA,¹² is used by national TNA teams throughout the TNA process, and gender is mainstreamed throughout TNA capacity building modules.

3.2 Coordination with NDEs, and other national focal points

The appointment of the National TNA Coordinator is the responsibility of the Signing entity (responsible ministry). The National TNA Coordinator will be the focal point for the effort and manager of the overall TNA process. In view of the role of National Designated Entities (NDEs) to the UNFCCC Technology Mechanism, it is strongly recommended that countries select their NDEs as their National TNA Coordinators. This will involve providing vision and leadership for the overall effort, facilitating the tasks of communication with the National TNA Committee members, National Consultants and stakeholder groups, formation of networks, information acquisition, and coordination and communication of all work products.

NDEs, NDAs, UNFCCC and GEF Operational Focal Points are sometimes hosted in different ministries or institutions, or different departments within the same ministry, and coordinated involvement engagement is not always a given at the initiation of a national TNA project. Emphasis should be put at the inception stage for involvement of these focal points. This is the responsibility of the national TNA focal point, and should be emphasised in the stakeholder guidelines and elsewhere so that proper attention is given to it at the inception mission. Thereafter, the national TNA coordinator has the responsibility, advised by the executing entity, to ensure continued contact with these focal points and their participation in relevant meetings.

3.3 GEF and GCF

The roles of the Operating Entities of the Financial Mechanism, in relation to climate technology transfer and TNAs are well described in a recent TEC paper,¹³ where the following is derived from.

Serving as an Operating Entity of the Financial Mechanism since the UNFCCC entered into force in 1994, the GEF funded the PSP under its 4th replenishment cycle (GEF-4, July 2006-June 2010) with USD 50 million; USD 30 million came from GEF Trust Fund country allocations, USD 5 million from GEF Trust Fund set-aside, USD 15 million from the Special Climate Change Fund (SCCF), complemented by USD 228.8 million in co-financing.¹⁴

Adopted at the end of 2011 as an Operating Entity of the Financial Mechanism, GCF shares a commitment with the GEF to address the climate emergency and support developing countries to raise and realise their climate ambitions. In the context of sustainable development, GCF promotes paradigm shift towards low-emission, climate-resilient development pathways by providing support to developing countries to limit or reduce their GHG emissions and adapt to the impacts of climate change, considering the needs of those developing countries particularly vulnerable to the adverse effects of climate change.¹⁵ Accordingly, GCF provides support through its Readiness Preparatory Support Programme (RPSP)¹⁷ and its climate change portfolio. The former refers to a process for accessing funding that begins from assessing a country's technology needs, including, but not limited to, technology development and transfer, led by a Nationally Designated Authority (NDA). The latter consists of projects whose investments are characterized as "intending to support paradigm shifts in both mitigation and adaptation".¹⁶

¹² <https://tech-action.unepccc.org/wp-content/uploads/sites/2/2019/07/web-tna-gender-guidebook-01.pdf>.

¹³ TEC/2022/24/9.

¹⁴ TEC PSP Review (December 2015) by S. Nakhooda <https://unfccc.int/resource/docs/2015/sbi/eng/16.pdf> refers to the Technology Framework adopted by COP7. The more recent reference to the Technology Framework adopted by COP24/CMA1 (Decision 15/CMA1) is also relevant.

¹⁵ p2, GCF's Governing Instrument <https://www.greenclimate.fund/sites/default/files/document/governing-instrument.pdf>.

¹⁶ <https://www.greenclimate.fund/projects>.

Both Operating Entities have endeavoured to rise to the challenge, offering strategic support to developing countries to limit and reduce GHG emissions and helping vulnerable societies adapt to impacts of climate change. This is evident in the ambition level, scope, and system-level and integrated approaches reflected in their programming directions,¹⁷ in the case of the GEF.

The GEF-8 Climate Change focal area strategy aims to support developing countries to make transformational shifts towards net-zero GHG emissions and climate-resilient development pathways, by promoting innovation and technology development and transfer. Over time, the GEF has moved towards a more integrated approach, more recently through 11 Integrated Programs allowing the GEF to better crowd-in other stakeholders, including the private sector, enhance knowledge sharing and learning, and ensure a more effective use of GEF resources

From the GCF's side, its Updated Strategic Plan (USP)¹⁸ set out to strengthen collaboration with the Technology Mechanism by identifying where GCF support could be used to unblock bottlenecks in value chains for technology innovation, diffusion, and transfer at different stages of the technology cycle, including using readiness funding to support national innovation systems and local technology production.¹⁹ As well, the GCF had implemented an Integrated Results Management Framework (IRMF) to assess how its investments deliver climate results and how its results contribute to the desired paradigm shift towards low-emission and climate-resilient development pathways.²⁰

3.4 TEC and CTCN

The COP and the Technology Mechanism's bodies, TEC and CTCN, have worked to strengthen the TNA process and support to enhance implementation of TNA results. In accordance with its mandate on technology needs, the TEC has undertaken analysis on how the TNA process may become more coherent with other emerging UNFCCC processes, such as national adaptation plans and nationally determined contributions. The TEC has produced a series of policy briefs and key messages on enhancing the TNA process. The CTCN, in line with its mandates, has worked to support countries in implementing their TNA results through its core services, especially through its technical assistance. In 2014, the COP requested the TEC to provide guidance on how the TNA results, in particular the technology action plans (TAPs), can be developed into projects that can be ultimately implemented. Responding to this request, in 2016 the TEC, UNEP-CCC and the UNFCCC secretariat published a handbook on guidance for preparing a TAP.

4 Capacity building provision

Capacity building of the national TNA teams is an integral and essential part of the GEF-funded Global TNA Project. Throughout the project, capacity building through regional workshops is provided on how to conduct the different steps in the TNA process. In addition, technical support is provided throughout the project's lifetime by means of a 'help desk' facility operated by the regional partners. National Coordinators and/or the lead consultants are encouraged to contact them with any questions or queries they may have at any stage of the project. Peer to peer experience sharing is also facilitated during the regional workshops, where so-called champions from former TNA projects are invited to share their experiences from conducting and implementing their TNAs.

Capacity building strengthens stakeholder involvement and capabilities (skills, knowledge, and tools) of key national actors/players in developing TNAs, TAPs and project concept notes. This will lead to the delivery of quality TNAs with a robust nationally driven technology prioritization process for both mitigation and adaptation, improved Barrier Analysis and Enabling Framework reports, TAPs to support accelerated

¹⁷ https://www.thegef.org/sites/default/files/council-meeting-documents/2021_04_22_First_Meeting_GEF-8_PDs_Presentation.pdf.

¹⁸ <https://www.greenclimate.fund/document/updated-strategic-plan-green-climate-fund-2020-2023>.

¹⁹ Slide 16, Presentation by Emerson Resende (9 Sept 2021) GCF Support to Climate Technologies, TEC23 https://unfccc.int/tclear/misc/_StaticFiles/gnwoerk_static/tn_meetings/d1500c56909f438c84888fc709715c4c/ae04d9c9e736457fab3e7e8aded1b4a7.pdf.

²⁰ Section 4.1, ¶10, GCF (June 2021), Integrated Results Management Framework <https://www.greenclimate.fund/sites/default/files/document/gcf-b29-12.pdf>.

implementation of technologies, and better articulated project ideas. Good communication and awareness raising of TNA/TAP results all along the process will increase interest among national and international institutions, including among private sector and other non-state actors for taking up TNA/TAP results for implementation.

4.1 Suggestions for improvements of national capacity building support

Feedback from TNA III teams, referred to in 2.2.4, contained comments on the capacity building support provided in the TNA projects. Some of the recommendations are already being addressed, for example in TNA IV, while others may require significant extra resources, or may be impractical or beyond the scope of the TNA. Comments and conclusions on the suggestions are included in Annex II.

Most of the country teams' comments were directed at the support and capacity building activities, for example suggesting that more time could be dedicated, and that the scope could be extended beyond the core team of coordinator and consultants, to training of working groups and stakeholders. While such capacity enhancement would be desirable, it is normally considered the responsibility of the core team to pass on knowledge of the methodology to the wider group of stakeholders. Such broader training would likely be beyond the scope of the resources available per TNA country. These issues could be covered by placing more emphasis on "training-of-trainers" in the training of country core teams, so that the knowledge is made more widespread.

Other comments targeted the need for examples of successful implementation and other countries' experience, and networking among country teams. While the TNA Stories brochure is regularly updated and distributed by UNEP-CCC and UNFCCC Secretariat, all completed country reports are available on-line at UNFCCC and UNEP-CCC, and Global Experience-Sharing workshops are held regularly, no doubt more attention could be drawn to these facilities, and more effort could be focused on mutual learning opportunities.

5 Implementation

Implementation of TNAs and TAPs goes beyond the scope of what is possible to accomplish within a TNA project, given the available timeframe and budget resources. Hence implementation guidance is currently not part of the existing TNA guidance *per se*, but TNAs/TAPs should nevertheless lead up to the identification of implementable actions and provide solid concept notes, as described in section 2.2.3.

Previous work of the TEC has looked into gaps, challenges, and good practices of the TNA implementation process, and has provided examples of how countries have successfully taken prioritized technologies from the TNA reports through to implementation. This included analyses of experiences, lessons learned and good practices in conducting TNAs and implementing their results, and the TEC produced a paper on good practices in conducting TNAs,²¹ a policy brief,²² and recommendations to COP/CMA.²³

5.1 Success stories

More than forty implemented TNA-based projects have been presented in five brochures "From needs to implementation" produced by UNEP-CCC^{24, 25, 26, 27, 28}, building on the available evidence of initiatives and actions

²¹ https://unfccc.int/ttclear/misc/_StaticFiles/gnwoerk_static/tn_meetings/9c6eaaa690534874bbcb85bada9882c/b566fb9540cd4932b5503a0518d2af94.pdf.

²² https://unfccc.int/ttclear/misc/_StaticFiles/gnwoerk_static/tn_meetings/50b16fbc66b4e179a4c36f565988f45/c34481032d0d4a819b6e7bd12ff00ef0.pdf.

²³ https://unfccc.int/ttclear/misc/_StaticFiles/gnwoerk_static/tn_meetings/6dd46cbeb481415f8e5ffb44262aecb7/61c3d1ae9d254e9b969de0f5a8771e68.pdf.

²⁴ <https://tech-action.unepccc.org/publications/from-needs-to-implementation-stories-from-the-technology-needs-assessments-2016/>.

²⁵ <https://tech-action.unepccc.org/publications/stories-from-the-technology-needs-assessment/>.

²⁶ <https://tech-action.unepccc.org/publications/from-needs-to-implementation-stories-from-the-technology-needs-assessments-2019/>.

²⁷ <https://tech-action.unepccc.org/publications/from-needs-to-implementation-stories-from-the-technology-needs-assessments-2021/>.

²⁸ <https://tech-action.unepccc.org/publications/from-needs-to-implementation-stories-from-the-tna-2023/>.

taken by countries following TNAs. Attribution of TNA to the proposals, actions and implementation is not always obvious since actions can be associated with multiple activities in the country. Developing a new guidance on preparing concept notes for TAP implementation, could help to identify common elements that contributed to the implementation and include these elements.

The engagement of key stakeholders, including decision-makers, during the TNA and post-TNA stages, is instrumental in securing that TNA-prioritized technologies are included in new and ongoing governmental programmes, strategies, and plans, so that sector-level goals can be achieved with the help of concrete actions from TNAs and technology action plans (TAPs). This also helps substantiate requests for funding from domestic and international funding instruments.

Co-development of TNAs and TAPs with Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs), Global Environment Facility (GEF), Green Climate Fund (GCF) and Adaptation Fund pipelines and using the TNA results as inputs to these instruments, helps to mainstream TNA outcomes in overarching national strategies and programmes for climate and sustainable development.

Development of pilot projects will help to demonstrate available technology options and allow for gaining experiences with their utilization 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 Climate Technology Centre and Network (CTCN), including for the preparation of concept notes for funding of proposals, and delivery of appropriate trainings to enhance local capacities.

Integration of TNA results in a country's overarching policy framework, such as development and climate policy, is a key mark of success for a TNA process. Such integration confirms that the prioritized technology-support policy processes are stakeholder-driven, and at the same time increases the likelihood for the technology options to be financially supported. From the perspective of technology-neutral policies, the link with TNAs is also attractive as the TNA is an unbiased process that allows technology options to be shortlisted in-line with a country's social, economic and environmental priorities, and recommends measures for optimizing market conditions.

Countries can build upon their TNA results in seeking funding from various sources, including the GCF and the GEF. However, it has been indicated that the step from a TAP towards a successful funding proposal is often challenging, due to resource and capacity limitation. An example of good practice in this regard, described in this paper, is that of a private bank, operating in a TNA country, that considered TNA-prioritized technologies as input for a GCF funding proposal²⁹.

The quality of TAPs was considered by countries of vital importance for the likelihood of implementation of TNA results. Analysis of TAPs prepared in TNA Phase II showed a significant improvement in the quality of information compared with TNA Phase I, as many countries followed the updated TEC TAP guidance.³⁰

The role of equipped and trained champions is key for projects success, to continue work beyond TNA project borders.

5.1.1 Common elements of success

The TEC paper on 'Experiences, lessons learned and good practices in conducting TNAs and implementing their results',³¹ identified a number of factors for success. These success factors are addressed below, indicating how they are already addressed in the GEF-funded Global TNA Project guidance and practice, and with suggestions

²⁹ See the case of Mongolia in Stories from the Technology Needs Assessments (2017)

<https://tech-action.unepccc.org/wp-content/uploads/sites/2/2019/05/tna-flyer-2017-web-18.pdf>

³⁰ UNFCCC/UDP (2017) Enhancing Implementation of Technology Needs Assessments – Guidance for Preparing a Technology Action Plan. UNFCCC Secretariat and UNEP DTU Partnership, Copenhagen.

https://unfccc.int/ttclear/misc/_StaticFiles/gnwoerk_static/TNR_HAB/33b283a23cec442abf8c04e734bc545a/bbd4572425c84815834512ebddf13964.pdf.

³¹ https://unfccc.int/ttclear/misc/_StaticFiles/gnwoerk_static/tn_meetings/9c6eaa690534874bbccb85bada9882c/b566fb9540cd4932b5503a0518d2af94.pdf.

for how they may be reinforced in new or enhanced guidance, referring to paragraphs in the draft paper by (§ number).

- **Engagement of stakeholders and ministries, during and after TNA (§ 87(a)):** Engagement post-TNA is challenging due to resource constraints, but the national coordinator and TNA committee can be encouraged to ensure continuity, in order to include TNA-prioritised technologies in new or ongoing governmental programmes, so that sector-level goals can be achieved with help of concrete actions from TNAs and TAPs, and to substantiate requests for funding from international funding programmes. Success will also depend on ownership, involving other ministries, as highlighted below.
- **Co-development of TNAs and TAPs with NAMAs, NDCs, GEF and AF pipelines (§ 87(b)):** Countries are already encouraged to coordinate these actions and initiatives, but more focus should be given in conjunction with the NDE, NDA and national climate change committee.
- **Aligning the TNA institutional structure with an existing climate committee (§ 87(c)):** Recommendation in the GEF-funded Global TNA Project is always to involve existing structures, e.g. national climate change committee, (See the Step-by-Step Guidance p 16). The recommendation can be emphasised in the inception stage and the guidance material to encourage compliance, but more important is to encourage TNA teams to utilise the committee and its broad representation to facilitate meaningful and continued involvement by relevant ministries and other entities.
- **Development of pilots to demonstrate a technology option (§ 87(d)):** This emphasises further the importance of coordination with NDA and NDE in order to facilitate funding which would be beyond the scope of the normal TNA project.
- **Consideration of TNA prioritised technology options in proposals submitted to the GCF (§ 87(e)):** While the step from a TAP to a GCF proposal is significant, support can be obtained for the intermediate step of a concept note (CN). Support for preparation of one CN already included in TNA III and IV, with more envisaged in TNA V. Countries may be encouraged to seek further support for CN development, for example through CTCN.
- **Ownership of TNA and its sector/technology components (§ 89):** Clarity on ownership among key stakeholders increase the chances 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 which national entities will take responsibility for implementation of the TAP and its specific sector/technology elements. Advantages of such ownership, beyond the immediate host institution, need to be clarified and reinforced in the inception stage of the TNA process, and emphasised in the guidance material and throughout the project.
- **Strong coordination (§ 89):** To facilitate this broader ownership, the inception process and guidance needs to emphasise the need for strong coordination among these other entities, and for relevant responsibilities and the ‘sense of ownership’ to be transferred by the coordinator to people and organisations with sufficient resources, mandate, and enthusiasm.
- **Technology ‘champions’ (§ 91):** The concept of ‘champions’ (persons or groups who support or facilitate specific technologies through to implementation), related to ownership, should be introduced, and emphasised in the guidance and initial stages of the TNA.
- **Integrating TNA results into national-scale policy processes (§ 93):** TNA guidance and engagement at the inception stage should reinforce the importance of coordination at all levels of government (national, regional, and local), so that locally and regionally relevant TNA results can be properly integrated at national level, ensuring access to funding possibilities.
- **Linkages with other processes such as GCF, GEF, and AF (§ 95):** Building on recommendations of the draft paper, it is important that TNA coordinators and teams involve other process in the TNA from the outset. This is already addressed in the TNA Step-by-Step Guide³² but it may be given more prominence in a revised version, highlighting the advantages, and emphasizing the practice at inception and throughout the project.
- **Engaging potential funders at an early stage (§ 96-97)):** TNA coordinators should be encouraged, through project inception and guidance, to engage in a collaborative process with in-country donors

³² <https://tech-action.unepccc.org/wp-content/uploads/sites/2/2019/04/2019-02-tna-step-by-step-guide.pdf>.

and national focal points of international climate-finance mechanisms, especially when specific technology options have been identified and in the early stages of TAP, to increase chances of funding and implementation, and to target the right funding sources. Indeed, in some cases, the TAP may be developed with the requirements of a funder in mind (§ 97). These ideas may be incorporated in revision of the Step-by-Step Guide and the TAP Guidance. Again, links to NDE and NDA are crucial.

Finally, it is important to recall that success factors may be country specific both with regard to location and country size. Therefore, caution is advised regarding generalisation of lessons (§ 88).

5.1.2 Lessons learned (challenges)

Challenges encountered by countries in reaching implementation of TAPs, can generally be summarized as follows:

- Many climate policies, such as NDCs, are ongoing or recurrent processes. TNAs on the other hand are often regarded as one-time projects, with limited links to the other processes. There is a risk that the results are no longer considered and pursued once a TNA has been completed. It is therefore crucial to embed the results of a TNA/TAP in other processes for their implementation, monitoring and review. Points highlighted above in 5.1.1, such as ownership, champions, links to national processes, etc. can help to ensure that TNAs/TAPs are not conducted as standalone processes or disconnected from current efforts. Hence, there should be provisions for updating countries' TNAs every five years (following the NDC update cycles as per Paris Agreement, or the developing countries may update it in conjunction with their NC reporting cycles)
- The level of quality and depth of TAPs and project ideas, especially regarding market and economic information, is often lacking. Often this is because the TAP and project idea focus occurs late in the TNA project, in-turn because of time spent in the initial prioritisation step. Guidance, training, and engagement with the TNA teams should encourage more pragmatic approach to prioritisation and earlier initiation of the BAEF and TAP steps.
- There is a need for increased private sector engagement since it is widely recognized that involvement of the private sector, both in terms of financing and implementation is crucial. Recent experience in the CTCN supported TNA in Botswana has shown some success in engaging local private-sector actors, albeit late in the process. Private-sector engagement through targeted workshops, etc. should be programmed into the TNA process and guidance at an early stage.
- Secure high level political support and the engagement of donors and investors for the uptake of prioritized technologies at an early stage. A number of suggestions are outlined above in section 5.1.1.
- How can we ensure technology-inclusive action plans are attractive for financing sector? The private sector and finance sector actors need to be engaged at an early stage of the process, along with other ministries and stakeholders, as highlighted in section 5.1.1, to ensure broad ownership and involvement in the plans. Involvement of influential ministries like finance is crucial, and here the NDA can often play a role.
- Which interactions are needed to regularly inform countries on implementation options and finance?

Nevertheless, each country will experience different circumstances and challenges.

Finally, learning from implementation of TNA results is hampered by the absence in a TNA of steps and resources for monitoring and evaluation. The TNA process concludes with the delivery of the TAP. The lessons learned from the TNA success stories as collected by Bee, Traerup & Hecl (2017), however, show the benefits of collecting information about how countries proceed with TAPs, how they link TNA results with other ongoing strategic processes, and what they undertake to apply for national and international funding.

6 Linkages

6.1 Global processes (NDCs, NAPs, LT-LEDS)

There are many potential linkages between TNAs, NDCs, and NAPs as argued by earlier papers by the TEC^{33, 34,35}. For example, TEC (2018) compared possible NDC design and implementation steps with those in the TNA guidance, concluding that outputs from one process could be used as input for the other. Recent synthesis reports on NDCs and TNAs, indeed, highlight that the processes refer to each other in several stages of their development. Most of the recent TNAs have used the country's NDC as a starting point for the analysis.

It was previously suggested that the TEC could provide guidance and good practice insights on the design of updating TNAs within the context of NDCs, whereas two possible options were outlined:

- a. Setting up a TNA updating infrastructure similar to the Global TNA Project, to help countries to regularly update their TNA outputs for inclusion in NDCs. This would enable continued technology-related capacity building in developing countries and peer learning by government officials. In this option, TNA updating would co-exist with NDC update processes;
- b. Integrating TNA updates within developing countries' NDC cycles. This could involve utilising tools from the TNA process for updating information, for inclusion in an NDC, on priority technology options within the country context, sector-level implementation conditions, cost data and potential funding opportunities. Possible examples of good practice of this option are countries that utilize funding from the GCF Readiness and Preparatory Support Programme to update their earlier TNA results.

7 Possible ways forward

7.1 Summary of main findings

In summary, the TNA guidance gap assessment finds, based on a review of existing TNA guidance material and prevalent gaps, for the different TNA process steps, that:

Step 1: Sector selection should remain consistent with the NDCs and NAPs. However, with the resources available for conducting a TNA, prioritization will continue to be required in order to avoid a proliferation of technologies to be examined, and to retain the depth of analysis necessary for the TNA. Countries should be encouraged to focus on the sectors where most gains are to be made by conducting TNAs, where technology transfer and barriers to technology deployment are recognized to be major issues.

The existing guidance material for Step 1 (Step-by-Step and MCA guides) requires only slight revision with regard to the basic MCA methodology. The guidance regarding prioritization criteria could be updated to include "newer" issues like transformational change. Experience from many TNAs is that countries tend to use an excessive number of criteria in the MCA with overlaps and unintended bias, as well as making the process very time consuming to reach consensus. A small number of well-chosen MCA criteria should be recommended, and sensitivity analysis of the MCA results should be mandatory.

The revision should incorporate and emphasise, in particular, the recommendations highlighted in section 5.1.1 related to success factors, including broad ownership in-country, and coordination and linkages with other

³³ TEC/2018/17/6

https://unfccc.int/ttclear/misc/_StaticFiles/gnwoerk_static/tn_meetings/53922e3ccac34eb2b6b9e11e7efaa5ae/d062f27bb86f48b2a5d4ba5849b9d460.pdf.

³⁴ TEC/2022/24/6

https://unfccc.int/ttclear/misc/_StaticFiles/gnwoerk_static/tn_meetings/748abefd145747009039d50f21808bce/bc2cc03ce6a45228e33de7031591436.pdf.

³⁵ TEC/2017/15/7

https://unfccc.int/ttclear/misc/_StaticFiles/gnwoerk_static/tn_meetings/832d56542dd84a22bfbb5b4d24aa8c83/21b74f6f3d084f49b23f44c987e33408.pdf.

processes, including recently established ones like Net Zero and LT-LEDS, and with the NDE, NDA and GEF's Operational Focal Points. Feedback from TNA teams on (Annex I) should also be considered in the revision.

Step 2: The barrier analysis and enabling frameworks guidance, as well as the training material presented to consultants generally addresses the issues needed. Smaller updates could be made, such as mainstreaming gender considerations into the guidance, however this has been done in the general Step-by-Step guidance that supplements the barrier analysis and enabling frameworks guidance.

Step 3: The existing TAP guidebook adequately addresses most aspects; however, it should be updated to address Transformational Change and Gender issues, involvement/ownership of other national entities/ministries, and targeted project idea and concept note development involving relevant funding agencies. The TAP guidance should emphasise the importance of this step with regard to implementation, and therefore the need to ensure adequate time and resources are dedicated to the work, and to the engagement across ministries, stakeholders, and financing agencies.

General TNA approach: The TNA stakeholder guidance could be updated to incorporate lessons from recent TNAs. Similarly, the relevant sections in the Step-by-Step Guide should be updated. Stakeholder engagement could be further emphasised in the TNA capacity building workshops, based on the updated guidance material and concrete experience from past TNAs.

7.2 Recommendations

The TEC could consider the options listed below.

- a) Collaborate with UNEP-CCC to update the main guidebook under the Global TNA project, Step-by-Step Guidance, to reflect aspects related to transformational change, with a section on concept note development that incorporates lessons learned in the TNA III and TNA IV experience and challenges, from CTCN Technical Assistance and from other concept note development initiatives, and on policy briefs.
- b) Prepare a new guidebook on the role of TNAs and TAPs in preparing and implementing Long-Term Strategies.
- c) Prepare a new practical guide on involving the private sector at all stages of TNA and in particular TAPs and project ideas.
- d) Prepare a new sectoral guidebook on technologies for the energy sector.
- e) Technologies are moving faster than before, creating redundancy in long-term technology plans, developed a decade or more in the past. A technology that was identified previously may have been replaced by more evolved technology, creating redundancy in submitted TNA/TAPs. To address this issue, a dynamic real-time TNA/TAP preparation/updating system could be developed to address technology redundancy. There could be provisions for updating countries' TNAs and TAPs every five years following the developing countries' NDC update cycles.

Annex I: Feedback from 16 TNA Phase III national teams

Topic	Suggestions for improving the methodology	Response
Methodology – general	<ol style="list-style-type: none"> 1. The methodology is quite complex for the those who are not used to the approach. It should be simplified further. 2. We have no specific suggestions regarding methodology. The application of the recommended methodologies was rather easy and allowed the sector groups to gradually move forward in the TNA process. (included to show satisfaction). 3. Dependence of methodology on factsheets presented a challenge, especially where it was difficult to access up-to-date or gender-disaggregated information. Future TNAs should support countries to build databases for local environmentally sound technologies. 4. Please develop a methodological guide for developing countries or indicator sheets. 	<ol style="list-style-type: none"> 1. Contrast with point 2. 2. This emphasises the need for targeted training and awareness of different starting points and expertise. 3. More attention can be drawn to the vast collection of factsheets in previous TNA reports available online. Country teams are expected to adapt the factsheets to national conditions. 4. A methodological guide is already available in the Step-by-Step Guide. It can be updated and extended as mentioned in this document, including indicators as appropriate.
Methodology – specific	<ol style="list-style-type: none"> 1. Facilitate understanding of the development of problem and solution trees by treating a single example of technology from start to finish. 2. During the stage of technology prioritization, experts should have the opportunity to provide weighted inputs to guide the selection process. This can help avoid allocating time to concepts that are likely to be deselected. In addition to expert inputs, it may be beneficial to consider other factors such as market demand and potential for scalability. By taking a holistic approach to technology prioritization, organizations can make informed decisions that align with their overall goals and objectives. 3. Baseline data collection should be considered as an optional part of the process. 4. Incorporate analysis of vulnerabilities to the impacts of climate change in order to better understand technology needs. 	<ol style="list-style-type: none"> 1. The Barrier Guidelines contain a description of the problem/solution tree approach, and considerable time is devoted to this in the training sessions. More focus on the approach in guidelines and training is possible. 2. Consultants are free to guide the process, but this can be addressed in training. Excessive and unnecessary time is often spent in the prioritisation process. 3. Unclear what is meant here. The TNA report normally starts with a summary of country situation, technology factsheets address local conditions, and TAPs should state starting point and ambition. 4. Climate vulnerability analysis is beyond the scope of TNA, but should be addressed in other national climate activities. It should be referred to in the TNA report if available.
Guidance materials	<ol style="list-style-type: none"> 1. Further clarify and improve the drafting of the chapters of the TAP report preparation guide on capacity needs and the sequencing of activities. 2. Provide countries with technical resources, such as good practice guides, case studies, technical reports, and tools for evaluating TAP activities. 3. A step-by-step guide for cost benefit analysis (CBA) would be helpful. With that CBA experience sharing from other countries would also have been very beneficial. 4. Improve the quality of translation from English to French in terms of materials. 5. The challenge we had were the TAP Template. We had a lot (of) information that were really useful, but we were requested to limit the report to 45 pages. I think it should be opened to the quality of information instead limiting the result to 40/45 pages. 	<ol style="list-style-type: none"> 1. The TAP guide may require updating and improvement with regard to these issues. 2. Hopefully, these issues can be addressed in revising the guidance material. Some of it may be addressed by making country teams more aware of existing material. 3. The Barrier Analysis guide contains two simple worked out examples. These may be enhanced. Otherwise reference can be made to standard CBA material. 4. The need for translation of materials is noted. This can be done provided resources are available. 5. The page limit is only a guideline. Several countries have exceeded this where the need was felt. 6. The TNA Stories and attempt to do this. Tracking and attribution of

Topic	Suggestions for improving the methodology	Response
	6. Emphasise successful examples of implementation of technologies in mitigation and adaptation for mastery of tools by consultants.	implementation is a challenge, but it has high priority.
Topic	Suggestions for improvements for other capacity building support	
Time	<ol style="list-style-type: none"> 1. It is important to take enough time for the consultants to learn and appropriate the working methodology for the TNA process. 2. Dedicate sufficient time to training to promote exchanges and collect sufficient data and information necessary for the TNA process. 3. Online workshops need more discussion time between consultants to consultants to share experience and to discuss more to step forward in the project. 	<ol style="list-style-type: none"> 1. The regional training workshops are provided and backed up with e-learning modules for repetition and consolidation. These latter may be updated. 2. Generally three-day training workshops are the optimum with regard to concentration and absorption, as well as available resources. Training and sharing of knowledge can continue online if required, but this is dependent on the funding available to the project. 3. On line workshops were mainly a feature of the Covid pandemic, though they may be continued in future as a supplement to physical meetings. By their nature, the physical meetings provide more time and opportunity for sharing ideas and discussion.
Availability of experts	<ol style="list-style-type: none"> 1. Identify several experts beforehand with the competent structures in the fields concerned to compensate for the unavailability of experts during the collection of data and information. 	<ol style="list-style-type: none"> 1. Availability of experts remains a challenge, especially in the smaller countries. There is a question of resource limitations at the individual project level, and every country is different. Country teams need to identify appropriate experts, beyond borders if necessary.
Capacity building	<ol style="list-style-type: none"> 1. Multiply the regional capacity building workshops for a good appropriation of the working methodology. 2. TAP implementation is the most difficult part of the entire TNA process. In this sense, there should be more training activity for the TNA coordinator and the main people responsible for the sectors directly involved in the TNA in order to show them in a practical way how to proceed in order to be successful with the implementation of the project ideas of their TAPs. 3. Capacity building of coordinators and NDEs: I would recommend that capacity building should be a continue process for the TNA coordinators and that TNA coordinators should be given additional supports or support should be provided to the NDEs in ensuring that they continue to elevate discussion on the implementation of their respective TAPs. Without support, I am with the conviction that NDEs/TNA Coordinators would not be capacitated enough to implement TAPs. 4. The approach should have provision for at least 2 intensive engagements for experts, to build more confidence in the methodology, especially at the point of analysing barriers. 5. It was a lot easier to apply the methodologies for the Technology Prioritization process as compared to the Barrier Analysis, TAP and Project idea development. 	<ol style="list-style-type: none"> 1. Three regional capacity building workshops are provided to cover the three steps, consistent with the resources available. 2. Agreed that TAP and implementation are important, and more time and resources should be dedicated there. 3. Continued capacity building of coordinators and NDEs is beyond the scope of the TNA projects, but may be possible for example with CTCN and GCF Readiness support. 4. Three intensive training workshops are provided. More intensive training would require more resources for each country. 5. Step 1 is generally the “easiest” but often consumes most time. Time could be saved by more focussed MCA and prioritisation. 6. Training missions, while desirable, are limited by project resources. 7. Training of public administration executives is beyond the scope of the TNA projects, but could be considered for GCF readiness or CTCN support. 8. It is a good idea to incorporate more practical examples in the training sessions.

Topic	Suggestions for improving the methodology	Response
	<ol style="list-style-type: none"> 6. Multiply the training/capacity building missions of technical structures by DTU and ENDA. 7. Intensive and continuous training of public administration executives on the monitoring of TAP activities. 8. Practical training based on experience using concrete examples to help participants better understand the concepts. 9. Set aside more time for the training of trainers. 10. Provide means for restitution (training) to take place at the country level. 	<ol style="list-style-type: none"> 9. This is limited by overall resources but can be considered. 10. This may be an artefact of the Covid period. Three training sessions at regional level are provided with the possibility of one mission at country level by the regional centre.
Stakeholders	<ol style="list-style-type: none"> 1. The methodology outlined in the TNA handbook has the potential to produce results which are biased by the uninformed perception of some stakeholders. The results of the process were skewed based on the composition of stakeholders who were willing to participate. 2. There may have been a few instances where stakeholders identified that they had already provided such information in the context of another study or project through the engagement with stakeholders. The outcome then was to twin the activities with the TNA activities to ensure stakeholder participation and feedback without competing for priority. 3. The stakeholders on the TNA working groups, Steering Committee, etc., realistically have only a fair understanding of the tools and methodologies of the TNA. This is because by design, it is only the consultants and coordinators who are trained in these relatively unfamiliar approaches. 4. Stakeholders only get a one-time exposure to these methodologies during the national stakeholder engagements, where they are introduced to the tools, and are required to apply them there and then to priorities or analyse the technologies. 5. Include broader stakeholder consultations. 	<ol style="list-style-type: none"> 1. Participation of stakeholders and possible bias is an issue that can only be addressed at the country level. However, recommendations can be incorporated in an updated S/H guideline. 2. Stakeholder management and engagement is tricky, and fatigue is a real issue. Coordination and exploitation of synergies at the country/sector level may be possible to minimise this. 3. The national consultants need to take on the task of experts, trained at the regional workshops, and utilising the full set of guidance including e-learning. Significantly increased resources would be required for more personalised training of resources. E-learning modules may be a solution. 4. As above. 5. The extent of stakeholder consultations is determined by the national TNA coordinator and the consultants. Extensive stakeholder consultation is recommended and is an essential aspect of the TNA.
Gender	<ol style="list-style-type: none"> 1. Insist with the structures concerned to favour the appointment of women at meetings in order to raise their level of representation. 2. Methodology for gender analysis should be given and explained more since there is no specific gender expert in the project. 	<ol style="list-style-type: none"> 1. Gender issues are a national matter, but recommendations are set out in the gender guidelines. 2. The gender guidelines are available, but may require updating if there is a demand.
Local / sub-national participation	<ol style="list-style-type: none"> 1. Prescribing numbers of experts to engage, and restriction of resources in light of the same, made geographical participation of key stakeholders impossible. This should change. 2. The methodology should in future provide for localized as opposed to the broader national-level assessment. This is because even within the respective countries, culture, population, and pressure on natural resources vary. 	<ol style="list-style-type: none"> 3. The numbers of experts to engage is decided by the national coordinator within the limits of the resources available. Different priorities will affect the resources available for consultants. 4. The national coordinator and sector consultants must design the national/regional focus within the resources available.
Support on technologies	<ol style="list-style-type: none"> 1. More support/technical assistance can be offered to the local consultants in generating an initial list of technologies appropriate to the local context. 2. Support the implementation of a sub-regional program of TNA relevant technologies. 3. Fund the development of concept notes for other technologies. 	<ol style="list-style-type: none"> 1. The technologies available vary from country to country and it is difficult to define a categoric list at global level. However, the sectoral guidance material provides some guidance on possible technologies. 2. As above, but this might be worthwhile if resources were available.

Topic	Suggestions for improving the methodology	Response
		3. TNA V will support the development of three concept notes. Additional funding can be sought from the CTCN.
Networking	<ol style="list-style-type: none"> 1. Facilitate exchanges between experts from different countries through effective communication channels (WhatsApp, etc.). 2. Facilitate the creation of collaborative networks between countries for the sharing of knowledge and experiences. 	<ol style="list-style-type: none"> 1. Increased networking is possible and may be introduced in future TNAs based on discussions at regional workshops. 2. As above. At the moment all past TNA reports are available online.
Dissemination / outreach	<ol style="list-style-type: none"> 1. The country coordinator team needs a lot of push from UDP to go forward to proceed any processes in time throughout the project. Moreover, UDP needs to discuss/explain more clearly about the project including budgets, processes, sector selection, reports, etc. with/to the DG of related line department. Otherwise, the country coordinator team will be repeating some processes and will be delaying some processes due to remarks from the DG. 2. Plan to cover publicity costs for the documents produced. 	<ol style="list-style-type: none"> 1. This is a country-specific issue which may stem from the covid period. The issue can be solved by appropriate meetings and discussion in the inception mission. 2. The TNA budget includes resources for printing, etc. within general project costs. This has been utilised by several countries in the past.
Country support – general and continued	<ol style="list-style-type: none"> 1. Continue technical support missions to countries as part of the TNA process. 2. Support countries to capitalize on achievements and internalize the TNA process. 3. Produce and share tools on time. 4. Set up a TAP monitoring mechanism. 	<ol style="list-style-type: none"> 1. Support missions beyond the project period are not possible. Continued support may be sought through CTCN or in a future TNA. 2. The present TNA budget allows for outreach activities, publications, to publicise and raise awareness. The use of resources is under the control of the national coordinator. 3. Every effort is made to produce and share tools so that they are available at the appropriate time. This may have been a consequence of the Covid pandemic. 4. This is beyond the scope of the TNA as such, but is already considered by the UNFCCC/TEC. It requires dedicated resources and workforce to monitor the implementation of TAPs.

Annex II: Recommendations from TNA Terminal Evaluations

Terminal evaluations of the TNA I and TNA II projects have been carried out^{36,37}. The recommendations from the evaluations, and responses to them, are shown in the tables below. Many of these recommendations have already been implemented in the TNA methodology and process.

TNA I terminal evaluation (September 2016)

	Recommendations	Response
The Project team, UDP and UNEP for TNA I and II		
1	Recognize and reach out to ongoing/completed projects on technology for climate change, and link to TNA II	Information is shared via the web-sites, e.g. UDP TNA website and in addition UNEP developed a site to reference all its technology projects with links to respective websites: http://www.unep.org/technology/ http://www.unep.org/technology/search-portfolio
2	Work with UNFCCC to ensure all TNA reports are also available at the UNFCCC website	information timely shared via these web-sites
3	Explore options with the key partners – countries and regional centres and the stakeholders to enhance and improve dissemination of key issues, public policy and coverage about technology issues related to climate change in more and different forums	Updated TNA website, regularly updated, all TNA reports downloadable, TNA newsletter
4	Commit to a minimum agenda (could be very brief and periodic) for following up on the core outputs, resulting outcomes and examples of successful programs	Success stories booklet published and repeated regularly. And via participation in different events, newsletters (and pod-casts) success stories have also been disseminated.
5	Ensure that the UDP incorporate into its strategic plans elements for future support, on the issues of technology and CC, as this is not a onetime effort; encourage and secure commitments of the competent cadre of staff involved to maintain the momentum and knowledge base on the key issues.	UDP is still heavily involved in TNA-projects – as executing agency under phase III (and upcoming phase IV), and other related activities. It is worth considering how to secure the legacy of knowledge built inside UDP over the years.
6	Review with UNEP DTIE and GEF on possible reallocations for the current budget for TNA Phase II, to ascertain the degree to which the GEF rules do allow for flexibility during execution of approved projects to take into account real experience and facts on the ground.	Outside control of UNEP project
7	Examine the possible value of engaging external technical reviewers of the work done, for example in mid-term reviews, which would cost more than the current practice but can provide additional perspectives, complementing the useful project monitoring systems in place.	No budgets foreseen to do this. M&E procedures still open for improvement, in order to support more effective lessons learnt.
8	Make efforts towards a revitalized steering committee to improve strategic decision making in this highly complex project, with multiple partners, as the priorities would be viewed differently by partners, based on their own different perspectives, and effective integration of the different views is important.	Despite changes the Steering Committee again did not function as envisioned and was dismantled after 2 meetings. SC members have busy agendas and also do not get any compensation. It is not clear if budget allocation could overcome this hurdle. As an alternative, links were being made to regularly consult UNFCCC secretariat, CTCN and GCF, via participation in the regular (at least bi-annual) TEC-meetings.

³⁶ UNEP Evaluation Office (2016), Terminal Evaluation: UNEP/GEF Project- Technology Needs Assessment Phase 1, 4 September 2016, UNEP, Nairobi.

³⁷ UNEP Evaluation Office (2020), Terminal Evaluation of the UNEP/GEF Project “Technology Needs Assessment Phase II”, April 2020, UNEP, Nairobi.

	Recommendations	Response
9 increase the participation of global stakeholder agencies at events so they are encouraged to follow up on the implementation	Partly – certainly at country level but also at global level, the participation of global stakeholder agencies was not substantially increased. UNFCCC-secretariat frequently participated at global events, and also CTCN and sometimes also GCF, but limited other agencies. CTCN and GCF are also – similar to UNEP and UDP - both a member of UNFCCC-TEC. At country level it varied, depending on the host agency of the TNA-coordinator, and how closely connected they were with the focal points / donors.
10	Increase internal competencies to more flexibly apply a range of tools and methods to the specific situations faced by country, sector and purpose. Consider a greater coherence for framing the issues adding perspectives from economics and politics how they interact and are influenced, and apply systems thinking, to clarify more how UDP can increase the value of the outcomes.	An issue still to be solved in multi-country projects that also are country driven. UNEP and UDP recognize this issue, but how should projects deal with generic training packages delivered as part of capacity building activities versus tailoring technical assistance to local conditions, when resources are limited. The typical approach is to provide guidance that is generic but also has some flexibility for countries to adapt.
11	In any discussions of technological change and innovation pay greater attention to the. Broader economic and financial barriers for example the effects of subsidies and to “unintended consequences”, which loom larger when a new technology is engaged at scale.	Update of the guidebook on ‘Overcoming barriers to the transfer and diffusion of climate technologies’. Issue addressed via the update of the guidebook and inclusion of it in the second regional capacity building workshops (on BAEF)
12	The issue of linkages between countries, increasing opportunities for learning between countries, linking to regional and global networks for knowledge, information, technology, and finance areas area for the subsequent TNA Phase II to pay greater attention to.	Organize global experience sharing workshop and regional capacity building workshops. Additionally, organize side-events during high-level (pre) COP-meetings. Achieved partially – the planned workshops and side events were organized but that does not directly translate into a direct and positive effect for the countries involved in Phase II.
TNA Participating Countries		
13	Countries involved in Phase II should note that many of the factors for greater national value are in their control. At the project level they include integration of such work within national decision making and climate change structures, energetic leadership at an appropriate national level with access to senior officials and to a wide range of ministries and departments, and a reasonable provision for national resources to complement the external finance.	More emphasis on the dissemination at national level; development of targeted briefing notes and activities to disseminate to decision makers. In phase II no budget was allocated for supporting the countries. In phase III specific budget was allocated.
14	Follow up at the national level after the project ends is also critical for the use of the outputs in national planning, financing, and programming.	... not part of the donor activity, and GEF rejected inclusion of such activity in new proposals. But at the same time agreed that the suggested recommendation is important. Seeking for ways how to deal with this, in close co-operation with TEC. Still limited systematic gathering of results post project, due to the fact that this is time (and cost) intensive, both at global level and at national level, and budget allocation was not allowed by GEF, neither for UDP nor at national level. Regular communication between UDP and the Regional Centres and the TNA-coordinators stops post-project and then relies on ad-hoc communication and interest from parties to reply on surveys sent out by UDP and/or UNFCCC. Still weakness ‘in the system.’
	Almost all the countries involved rely on multi-lateral and bilateral donor partners for critical financing support to complement	Advocate this for new countries; to engage with in-country donor / development partners’ community and also the GEF focal point, CTCN NDE and GCF NDA.

	Recommendations	Response
	national resources. Linking to them at the national level and sharing information on the findings of priorities and action plans determined through the project, to develop funded activities to take them forward. For this and in general many countries can follow some of the good examples by others in terms of dissemination, tracking and sharing information and follow up.	Partly improved, but still not adequately covered in all countries. Engagement with the donor community depends strongly on the network and experience of the TNA-coordinator, and it appeared not always properly aligned. As a result still a gap to be bridged between TAP, project proposal writing and submission to the right channels.

TNA II terminal evaluation (April 2020)

	Recommendations	Response
1	Strengthen capacity building at country level	Partially already incorporated in phase III (2 national trainings per country and three regional trainings in lieu of two, plus development of guidance materials on proposal development).
2	Develop new guidance materials, at least: (a) Guidance on Gender Responsive TNA and TAP (b) Guidance on access to finance and proposal development based on TAPs and project ideas	Done, and more (a) Guidance on Gender Responsive TNA and TAP (b) Guidance on access to finance and proposal development based on TAPs and project ideas
3	Improve the engagement with the private sector	Remains a challenge.
4	Strengthen the involvement of CTCN	Collaboration has increased.
5	Global project with multi-country involvement	Regional training workshops continue to provide peer-to-peer learning. Process was interrupted by Covid pandemic, and other factors have led to uneven start-up times. Global experience sharing continues.
6	Recommended interventions beyond phase IV	TNA V in preparation. Revised approach being planned to address different starting points and settings, enhanced private sector, new issues such as Article 6, transformational change, more emphasis on implementation.
7	Strengthen the M&E process	Recommendations partially implemented but hampered by Covid, UNEP-CCC transition. Enhanced M&E etc. to be incorporated in TNA V.
8	UNEP to develop a protocol on monitoring co-finance	Implemented.