

Thirteenth meeting of the Technology Executive Committee

United Nations Campus (AHH building), Bonn, Germany
6–9 September 2016

Outline

Methodology for monitoring the results of technology needs assessments

I. Background

1. Out of the 328 TAPs analysed in the TEC interim report, “Guidance on enhanced implementation of the results of TNAs,” some 72 per cent merely included indicators for monitoring success, and a few identified organisation which would be responsible for this monitoring. The TEC suggested ways forward towards improved TAP guidance, with a view to enhance implementation of TNA results, including monitoring of implementation of TAPs, as one of the key elements of the enhanced guidance.
2. As per activity 11 of its workplan for 2016–2018, the TEC is to prepare a draft methodology on how to monitor the TNA results, including what methodology such monitoring should include, with a view to highlighting success stories.

II. Scope of the note

3. The scope of this outline is to provide a background to the principles and methodologies of monitoring and evaluation, together with possible approaches that may be useful for the TEC in considering the draft methodology on how to monitor the TNA results, and in providing guidance to Parties.

III. Expected action by the Technology Executive Committee

4. The TEC will be invited to consider the outline and provide guidance on the use of the outline for the methodology preparation.
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Annex

Outline to prepare a draft methodology on how to monitor the TNA results, including what such monitoring should include, with a view to showcase success stories.

1. This outline serves as an information resource and it is designed to assist the Technology Executive Committee (TEC) in its work on technology needs assessments (TNAs) in preparing a draft methodology on how to monitor the TNA results, including what such monitoring should include, with a view to showcase success stories.
2. The outline¹ aims to provide a background to the principles and methodologies of monitoring and evaluation, together with possible approaches that may be useful for the TEC in considering the draft methodology on how to monitor the TNA results, and in providing guidance to Parties.

I. Introduction

3. Since 1999, developing countries have been conducting and reporting their TNAs to identify, prioritize and highlight their technology needs in various sectors, to mitigating greenhouse gases and adapting to the adverse effects of climate change. Fully supported by the national government and coordinated by a national ministry, the TNA is a key technology process under the UNFCCC that allows developing countries to self-determine their technology needs in line with their national development priorities.
4. The Global TNA project is supported by the Global Environment Facility (GEF) under the Poznan strategic programme on technology transfer, and is implemented by the United Nations Environment Programme (UNEP) in collaboration with the UNEP-DTU partnership (UDP). Phase I had the objective of providing targeted financial and technical support to assist developing country Parties in developing or updating their TNAs. In 2013, twenty nine developing countries prepared their TNA reports. The second and third Phases of the Global TNA project are building on that effort with 26 and 30 countries participating respectively. In 2016 more than 90 developing countries have undertaken TNA process².
5. Since 2013, as part of the second generation of the TNA process, developing countries also elaborate technology action plans (TAPs), which address barriers to the implementation of their prioritized technologies, and project ideas, which are concrete actions for the implementation of these technologies. These TAPs are tangible proposals to address the technology needs of these countries. Implementing the TAPs, including by linking them with processes such as nationally determined contributions (NDCs), nationally appropriate mitigation actions (NAMAs) and national adaptation plans (NAPs), will support enhanced action on climate change and enable developing countries to follow a low-emission and climate-resilient development pathway.
6. The TNA process evolved into three main deliverables: a TNA report, a barrier analysis and enabling framework report, and a TAP report. The TNA process under the Global TNA project is finalized by submitting the three deliverables in a form of reports. Several surveys prepared by the UNFCCC showed that TNAs process can deliver implementation of technology-inclusive mitigation and adaptation actions, however there is no system in place to systematically monitor and evaluate the implementation of the TNA results.

¹ The aim out this outline was to combine ease of use and useful outcomes relating to activity 11 of the rolling work plan of the TEC for 2016-2018. The selection of information resources responds to identified comparable evidence across low carbon community project oriented efforts. The list of resources is by no means exhaustive, as resources and methodologies are constantly evolving.

² More than 75 TNAs conducted in period 1999-2010 are called the first generation TNAs. The TNAs conducted after 2013, as part of the Global TNA project are called the second generation TNAs. The second generation TNAs were conducted in three phases until now, Phase I in 2011-2013 (32 countries), Phase II in 2015-2017 (26 countries) and Phase III should start in 2017 (20+ countries). At least 50% of the participating countries conducted their TNAs in both the first and second generation of the TNA process.

II. Why conduct monitoring and evaluation?

7. During the Phase I of TNA project, 29 countries have together developed 328 TAPs, of which 142 address mitigation and 186 concern adaptation. A vast majority of TAPs aimed at deployment and diffusion of priority technologies at a larger scale within countries, while some of the TAPs were designed to prepare for an implementation of a single project. Most of TAPs included a cost indication per action plan and per each activity included in the action plan, including identification of potential domestic and international funding sources. Most of the TAPs included indicators for monitoring the implementation of action plan.

8. To support the implementation of the UNFCCC Paris Agreement, Parties to the UNFCCC initiated the elaboration of the technology framework to further promote and facilitate enhanced action on technology development and transfer, where the work on TNAs will play a key role in the implementation of environmentally sound mitigation and adaptation technologies.

9. With the Global TNA project, the TNA process went into a new stage, applying an enhanced methodology to prioritize sectors and technologies, and to identify possible barriers and enablers. This comprehensive approach was reflected in the high quality of TNA reports with increased emphasis on prioritized technologies. More than 50 new TNA reports will be available by the end of 2017 which may deliver more than 500 mitigation and adaptation TAPs. The TAPs of the TNA process provide solid foundations for further development and implementation, and help close the gap between needs of developing countries and global support options. Parties to the UNFCCC recognized at COP-20 and COP-21 the need for the TNA process to be improved in order to facilitate the implementation of the project ideas emanating from it.

10. Out of the 328 TAPs analysed in the TEC interim report, "Guidance on enhanced implementation of the results of TNAs," some 72 per cent merely included indicators for monitoring success, and a few identified organisation which would be responsible for this monitoring. The TEC suggested ways forward towards improved TAP guidance, with a view to enhance implementation of TNA results, including monitoring of implementation of TAPs, as one of the key elements of the enhanced guidance.

11. Monitoring and evaluation, if used systematically and well, can become a powerful tool for TAP actions and activities³ promotion, replication, food for learning, and capacity building to win political, public and social considerations. Well designed and delivered monitoring and evaluation system may:

- Assess the effectiveness of TNA implementation;
- Provide feedback for program improvement;
- Improve internal and external (within and outside the TNA process) learning and decision making about the TNA process and implementation, including about success factors, barriers, which approaches work/ don't work, etc.;
- Empower and motivate TNA champions;
- Enhance accountability to key stakeholders (public sector, private entrepreneurs, funders, supporters, local communities);
- Inform decision making on national, and local levels;
- Share learning on regional, cross-national and other local levels (neighbor to neighbor);
- Contribute to the evidence base about effectiveness and limits of such action;
- Describe impacts on people's lives.

III. What is monitoring and evaluation in this outline (scope, ways, and steps)?

12. The scope of this outline is to provide a background to the principles and methodologies of project implementation related monitoring and evaluation, together with possible approaches that may be useful for the TEC in considering a draft methodology on how to monitor the TNA results.

³ Actions are at the center of a TAP and should aim to implement the measures identified in the analysis of barriers and enabling frameworks. An action is composed of several activities, which are the specific tasks or "sub-actions." needed to realize an action.

13. Monitoring and evaluation refer to two different functions. Monitoring is an analysis of a progress of action or activity, towards achieving planned results, with the main purpose to improve decision making. It provides oversight of the activity's implementation stage. Its purpose is to determine if the outputs, deliveries and schedules planned have been reached. Monitoring discussed in this outline may be understood as an analysis of a progress of TAP towards achieving its implementation. Its purpose is to determine if the outputs, deliveries and schedules planned in the TAP have been reached.

14. Evaluation discussed in this outline may be understood as an assessment of the efficiency, impact, relevance and sustainability of TAP implementation, in the light of its specific objectives.

15. Evaluation can also describe also describes unintended consequences of the project. Evaluation can provide ongoing recommendations and lessons to the implementation teams, and also provide information to guide implementation of similar projects in future. Although evaluation is done often retrospectively, its purpose is forward looking. Evaluation provides lessons and recommendations from implemented projects that is useful to decisions about ongoing and future actions or activities.

Table 1 presents a comparison between monitoring and evaluation. There are important differences when considering purpose, focus, participants and frequency.

	Monitoring	Evaluation
Purpose	Inform on progress	Evaluate the performance, learn from past to inform the future
Focus	Collecting analyzing and communicating factual information about actions and activities undertaken.	Assessment of outputs, outcomes, and impact of actions implementation.
Participants	Usually internal project stakeholders	Internal, or external evaluators, financial stakeholders, donors, national authorities etc.
Frequency	Throughout the action and activity lifetime	Usually at the end of the implementation effort, but can also be conducted throughout the project

16. The following approaches to monitoring and evaluation may be undertaken in the TNA and the TAP process:

Within the TNA project, or after the TNA project:

Timing:

- Monitoring within the TNA project to track what is happening (including the stages in the TNA process when TAPs are designed and drafted, involvement of financial stakeholders, extent to which the guidance has been used etc.)
- Evaluation after the TNA project (after the TNA process under the Global TNA project is concluded)

Internal or external:

- Monitoring undertaken internally within countries
- Monitoring undertaken externally (by an independent body)

Single or multiple:

- A one-time single evaluation
- A series of continuous monitoring and/or evaluation activities

Possible monitoring and evaluation steps:

1. Find out what to monitor or evaluate, involve stakeholders
 2. Design a plan
 3. Identify people to monitor and evaluate
 4. Undertake the monitoring and evaluation
 5. Collect and analyze data
 6. Discuss and provide a feedback (recommend improvements)
 7. Modify actions and activities, if needed
17. Several other issues should be considered in planning and conducting monitoring and evaluation. These include:
- Range and feasibility of M&E in relation to available resources (financial and human) so that the plan leverages rather than diverts resources from action;
 - Political feasibility of the project should be considered (champions with knowledge of political and social realities should be consulted)
 - Methods should be standardized, credible, valid, and reliable, to allow comparability with data collected by other stakeholders, so such efforts contributes to the wider evidence base;
 - Both qualitative and quantitative methods should be considered;
 - Planning, analysis and reporting should be responsive to differences between genders and among ethnic, religious, cultural, and other group differences;
 - Design and conduct should be ethical, including independence of personnel, consent to participate from all subjects, and protection from inappropriate uses of data.

IV. What criteria could be considered in monitoring and evaluating implementation?

18. Five criteria have been commonly applied by several international organizations⁴ in relation to monitoring and evaluation. Table 2 presents these criteria and their definitions.

Table 2

Criteria	Definition
Relevance	The extent to which the objectives of implementation are consistent with beneficiaries' requirements, national priorities, TNA project aims and donor policies.
Effectiveness	The extent to which the implementation objectives were achieved.
Efficiency	A measure of how economically resources and inputs into implementation process (expertise, funding, time etc.) converted into results.
Impact	Longer term effects produced by an intervention. (directly and indirectly, intended or unintended)
Sustainability	Continuation of costs and benefits from implementation, after it has been completed.

⁴ OECD-DAC, UN organizations, The World Bank.

19. When discussing a methodology for monitoring and evaluation of implementation related actions, some additional criteria were considered in some approaches:

- Range and feasibility in relation to available resources (financial and human) so that it leverages rather than diverts resources from action (focus on key information collection to reach agreed results);
- Results standardized, credible, valid, and reliable, to allow comparability with data collected by other stakeholders, so such effort contributes to the wider evidence base;
- Ethical in relation to data consent and protection.

V. Which TNA results should be entertained when planning for monitoring and evaluation?

20. The TNA project is country driven national process with the aim to identify technologies for mitigation and adaptation to support national development objectives. In the TNA process countries identify and prioritize mitigation and adaptation sectors, technologies, barriers, enablers and project inclusive TAPs. The implementation stage lies outside the current TNA deliverables. Therefore it is important to consider these TNA project specifics when planning monitoring and evaluation. Availability of resources also may limit the scope of M&E activities.

21. Prioritization of implementation related elements of the TNA project for monitoring and evaluation should be undertaken, and over what time period such exercise should be performed.

22. There are some common elements of each implementation process which may be discussed for potential monitoring: (what to monitor?). These may be translated into the TNA process:

- Inputs for monitoring and evaluation (conducted TAPs selected - with a highest ambition to be implemented)
- Actions and activities included in the selected TAPs and their real implementation potential (discussions with national champions)
- Outputs (objectives of a national champion in relation to implementation (quantitative and qualitative)
- Outcomes (programmes and projects implemented)
- Impact (benefits national, local, regional – economic, environmental, social, other) (check against outputs – how expected changes were achieved)

VI. Who to involve in the different stages of monitoring and evaluation (stakeholders)?

23. Key stakeholders should be identified at the beginning of the TAP process and their input should be solicited in designing, implementing, reporting, and communicating M&E procedures and results. Stakeholders include anyone likely to be affected by TAP activities. These include:

- People directly involved in the TNA/TAP project (TNA project coordinators, consultants, national governments that are involved in the TNA process etc.).
- Stakeholders in the broader national community, such as political decision makers, experts, academia, NGOs, relevant networks, community groups, etc.
- Individuals and groups who will be affected by the project, including workers (those who will be employed and those who may lose their jobs); local communities that may incur costs (such as displacement or pollution) or benefits (such access to electricity, economic benefits); and ecosystems that may be affected;
- External stakeholders including potential funders, promoters, opinion makers, and any other relevant groups of interest.

VII. How to assess impact (success) indicators?

24. Many projects involve change assumptions that may turn out to be inadequate or incorrect. For example claiming that raising awareness about climate change will change peoples' behaviors and hence reduce carbon emissions may not be fully demonstrated in practice, as there are multiple factors other than peoples' awareness that influence behavior. Mapping out change pathway and identifying change assumptions can help work out what contribution can be made, including what contributions other actors need to make. To track outcomes and impacts, monitoring and evaluation can also assist in testing how well founded such change assumptions are, and whether there is a need to modify project design.

Setting ambition:

25. It is important to be realistic, when setting an ambition concerning the impact of implementation. For example claiming that raising awareness about climate change will change peoples' behaviors and hence reduce carbon emissions may not be fully demonstrated in practice, as there are multiple factors other than peoples' awareness that influence behavior such as for example resources, social norms, infrastructures, technologies, and cultural norms. Therefore a project based solely on a change assumption runs the risk of not meeting desired outcomes.

26. Mapping out such change pathway and identifying change assumptions can help work out what contribution can be made, including what contributions other actors need to make. To track outcomes and impacts, monitoring and evaluation can also assist in testing how well founded such change assumptions are, and whether there is a need to modify project design.

27. Expectations regarding project implementation should be realistic. TNA countries were occasionally overly ambitious in their TNAs, and assumed they have the capacity to achieve their objectives when in fact changes required to reach the objectives often needed actions by a range of actors, not involved in the TNA project. Evaluators can help project managers to identify and modify unrealistic objectives.

28. Technology projects present special challenges and these should be considered in designing monitoring and evaluation. What are the costs of acquiring, maintaining, replacing, and recycling equipment? How do legal issues support or constrain implementation? What kind of training do workers require to install, operate, and maintain equipment? What safety procedures protect workers and local communities? What energy sources are required? How are waste products managed? What are the risks of catastrophic failure? What kinds of backup and emergency systems are in place?

29. Perceptions and attitudes may be as important as physical changes in judging a project's success. How do project managers, politicians, local leaders, non-governmental organizations, workers, and local citizens regard the project? What do they think has worked well and what needs improving?

30. What may be considered indicators of success for implementation of TAPs?

- Inputs: financial, personnel, facilities, training, etc. Track whether they were provided in a timely and usable manner.
- Objectives: What did the TAP intend to accomplish? What data would help to determine project success?

31. Possible assessment of impact (success) indicators:

- Track and assess what has changed⁵ (as discussed above in ambition setting - both intended and unintended);
- Understand the reasons for changes – roles of champions, governments, organizations, other factors,
- Interpret the changes people's experiences, collaborations, multiple benefits, communication etc.

32. The methodology should define a list of specific indicators, qualitative and quantitative, as well as baseline and targets to be able to measure achievement and progress for each indicator.

⁵ Examples of impact (success) of implementation of climate related actions may include: amount of CO2 emissions saved, awareness changing habits or target groups, quantification of enhanced economic, environmental and social well-being etc.

VIII. How to collect, analyze, and communicate the collected information?

A. Possible ways of information collection and analysis

Internal

33. In case the monitoring and evaluation steps may be inserted in the TNA project in future, and reported with other project deliverables, the information could be collected internally by a national TNA project champion. In such a case, the length of the TNA project would be extended until the implementation of the TNA results would be beneficial for local people, or project would be evaluated as failing the implementation.

34. The information would be collected internally, based on conducted prioritized TAPs and its relevant information, and records of “secondary” project influencing information would be also kept internally, including relevant policy changes, supporting environment changes, economic data etc. In case of both internal monitoring and internal evaluation credibility, validity and reliability of information could be discussed, due to a potential conflict of interest.

External

35. There is a way of conducting internal monitoring and evaluation, or commission an independent external body to evaluate. External monitoring and evaluation may avoid potential conflict of interest issue. External evaluators can use the information collected by the internal monitoring system but may also need to supplement this with other information collected from a range of internal and external stakeholders e.g. from group workshops, semi structured interviews and/or surveys. It should be taken into account that side by side with all advantages of external evaluation, it may be longer than internal, and will usually carry additional cost implications.

Types of data collection

36. Effective monitoring and evaluation involves use of a variety of methods and data sources. Both qualitative and quantitative methods should be considered. Quantitative information can include data about finances, equipment, costs, and adherence to schedule, as well as a host of other numeric variables. This information will allow to answer ‘what’, ‘how many’ and ‘when’ questions. Numeric data can also be collected through structured surveys about project implementation. Resulting statistics will provide information about stakeholder perceptions, and can be used to contrast differences among groups. Qualitative information can be obtained through methods such as interviews, focus groups, observations, and unstructured questionnaires. This information may address questions about ‘why’ and ‘how’, as well as perceptions, attitudes and beliefs.

B. Possible ways of information communication (providing of feedback)

37. Once the gained information has been collected and analyzed, dedicated reports, meetings and webinars could be organized to share, discuss and interpret findings. Key audiences should be well considered and data should be tailored to fit the interests and backgrounds of these audiences (converting multiple data into easy read graphs, charts etc.). Key lessons should be highlighted, and the information should then be incorporated into reports and useful background documents.

38. The audiences may include:

- TNA project team members including TNA champions,
- National politicians and decision makers,
- Financial community members,
- User community groups,
- Communication groups (media),
- Other relevant stakeholders,

IX. How to assess the influence or contribution that monitoring and evaluation have made to the observed outcomes (TAPs) and their impacts?

Possible retrospective assessments

39. One alternative would be to select a random sample of relevant and project (action) connected stakeholders to retrospectively assess the influence or impact of a project (action) or impact of specific (prioritized) project elements, on any observed outcomes or impacts.

40. However due to broad and possibly unequal range of information, this may not provide an objective or statistically significant assessment of the contribution, and as the responses are subjective may involve biases. On the other side it will allow building an assessment based on the perceptions of a broad range of relevant stakeholders.

41. Another alternative is to periodically (e.g. every few years) commission an independent evaluator/facilitator to explore the contribution to observed outcomes and impacts, such as through focus groups, group workshops and/or interviews with a range of internal and external stakeholders (e.g. from TNA project stakeholders, financiers, local community, media etc). This will allow the evaluator to build an assessment based on the perceptions of a range of stakeholders.

42. Possible questions for such assessments may include:

- What changes have there been in recent years on prioritized project elements?
- Who were the key actors driving these changes?
- What were the key factors driving these changes?
- What contribution has project has made to these changes?
- How influential has the project been, compared to other similar locally implemented projects, and why?
- What value added do you think project brought?

X. Possible elements to be discussed to initiate the work on the TNA methodology

Inside or outside the TNA process?

43. The monitoring and evaluation process could become a part of the TNA process (and project) as its next and the final deliverable (a monitoring report) which would mainly depend on the project holder, which is in the case of the Global TNA project the Global Environmental Facility. Other option would be to undertake the monitoring inside, and evaluation outside the TNA project, as an independent activity for which resources would have to be considered and employed.

Internal or external stakeholders?

44. Should the monitoring and evaluation, including information collection, analysis and communication be done by TNA project team including project champion, or should evaluation be undertaken externally by an independent organization?

Single or multiple and when?

45. Taking into account reported experiences with relatively slow implementation after the TNA projects have finished, it should be discuss whether one-time single monitoring and evaluation would be suitable for the TNA process, and at what stage of implementation monitoring would be undertaken. Another option would be to undertake more than one monitoring exercises and possibly one final evaluation.

All TAPs or prioritized TAPs only?

46. For both options elements to be monitored would have to be prioritized, out of the whole range of TAPs available for each country. In case of prioritization, country could be asked whether to monitor all

submitted TAPs, or whether they would prioritize only some of them, for which the prioritization criteria would have to be developed, in order to keep the results unified.

What to monitor from the TAP implementation?

47. Both quantitative and qualitative information could be monitored. Changes should be tracked, the reasons for changes understood, and interpreted. A series of questions on changes, actors, factors, contributions, influence and added value should be responded and presented. All these information should be provided a comprehensive, understandable, and timely feedback to the TNA implementation process.
