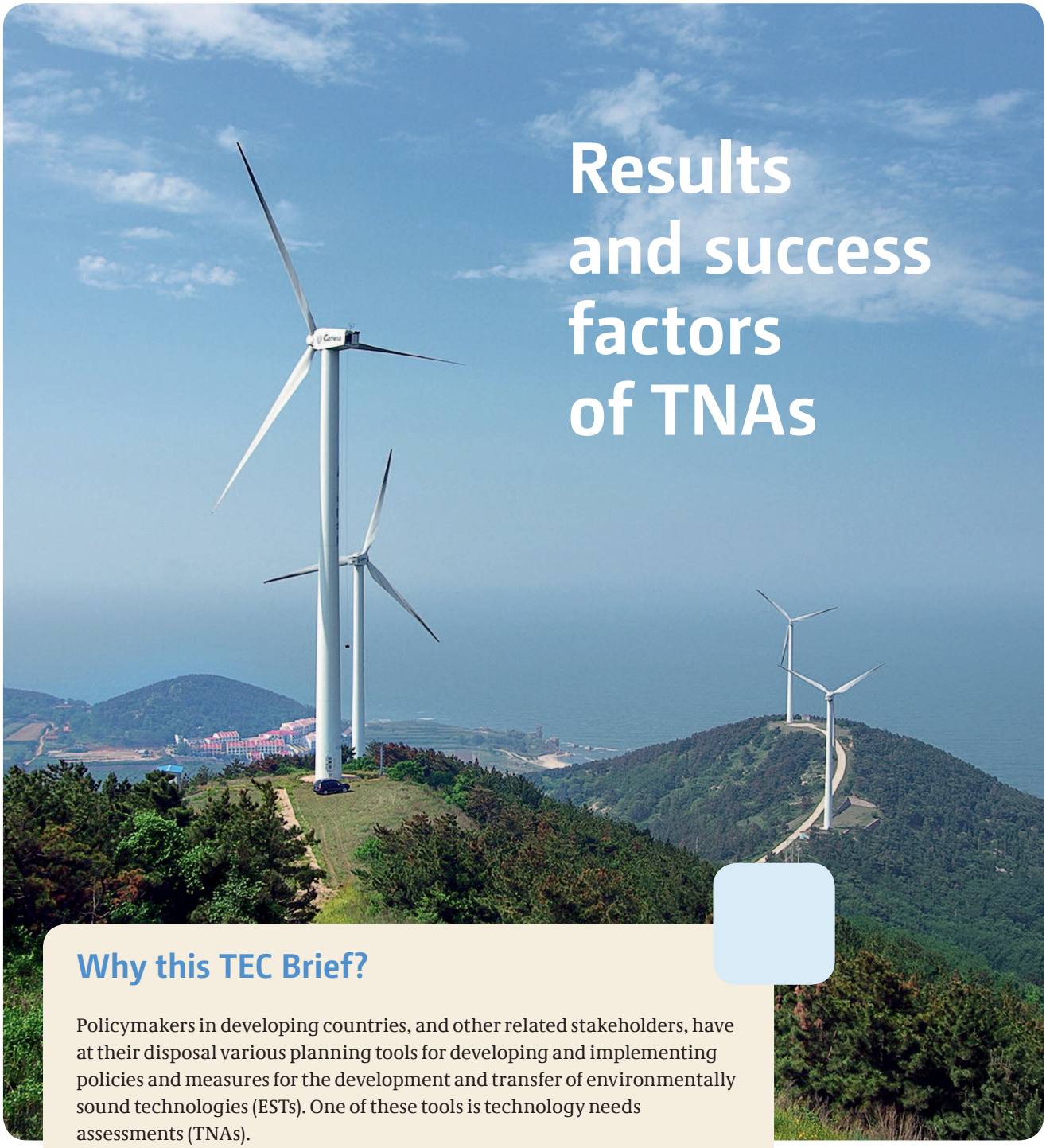
United Nations
Framework Convention on
Climate Change

TEC Brief

Technology Executive Committee



Results and success factors of TNAs

Why this TEC Brief?

Policymakers in developing countries, and other related stakeholders, have at their disposal various planning tools for developing and implementing policies and measures for the development and transfer of environmentally sound technologies (ESTs). One of these tools is technology needs assessments (TNAs).

This TEC Brief is aimed at informing policymakers about the results, success stories and lessons learned of the TNA process, with a view to improving the process and enhancing the implementation of its results.

Key messages[1]

Process

(a) Governmental engagement in the TNA process is fundamental to delivering predictable policies and creating appropriate regulatory frameworks to enable environments for investments and participation in innovative funding instruments, such as public-private partnerships.

(b) Thoroughly defined criteria for the identification of sectors and technologies, such as GHG emission reduction potential, cost, contribution to socio-economic-environmental development and technology maturity, should be the basis for identifying and prioritizing sectors and technologies.

Results

(a) Guidance on the development of TAPs and project proposals needs to be enhanced, and this includes sharing experiences gained in their development. It is essential to use TAPs to provide a basis for implementing TNA results.

(b) A better linking of projects to existing and future financial resources should be an immediate benefit of improved TNAs and TAPs. Early dialogue with funders – a basic criterion for project implementation – is essential, to ensure compatibility with their guidelines and funding criteria.

(c) Sound planning practices are essential for securing funding for project proposals included in TNAs, and ensuring their successful implementation.

(d) The TNA, NAMA, and NAP processes could feed into one another, to avoid duplication and overburdening the capacity of countries to report on development.

TNAs under the Convention – a brief look back

Since 1999, Parties not included in Annex I to the Convention have been conducting and reporting their TNAs to identify, prioritize and highlight their technology needs in various sectors, to reduce greenhouse gas emissions and to facilitate adaptation to the adverse impacts of climate change. In their efforts Parties have drawn attention to specific barriers to technology transfer as well as enabling factors for technology transfer and have suggested measures to address them. Parties have also highlighted various ways used to involve stakeholders conducting TNAs in a consultative process, and methodologies and criteria used to prioritize their technology needs.

Based on the TNA reports submitted by Parties, two synthesis reports (2006 and 2009) have been prepared by the UNFCCC Secretariat. The reports aim to identify common needs for ESTs, barriers to technology transfer, and shortcomings of enabling environments and measures to address these barriers, including capacity-building from a global, regional and national perspective. Both synthesis reports indicated that TNAs provide useful information for the implementation of future activities aimed at mitigating or adapting to climate change. A third TNA synthesis report is currently under preparation and is to be submitted at the nineteenth session of the Conference of the Parties (COP).

1 The key messages were distilled from the discussions with TNA stakeholders and experts during the TNA workshop organized by the UNFCCC in collaboration with the GEF, UNDP, UNEP and the CTI in June 2011 in Bonn, Germany, during the experience sharing workshop on TNAs organized by UNEP and UNFCCC in September 2012 in Bangkok, Thailand, and from the TEC-7 in-session expert workshop on TNAs organized in September 2013 in Bonn, Germany.

TNAs under the Poznan Strategic Programme

TNA development is a key component of the Poznan Strategic Programme on Technology Transfer supported by the Global Environment Facility (GEF). Under the TNA funding window, a global supporting program was opened by the GEF in 2009. UNEP in collaboration with the UNEP Risoe Centre implemented a new round of TNAs, on behalf of the GEF. They provided targeted financial, technical and methodological support to assist countries in conducting TNAs. In 2013 the GEF Council approved a subsequent UNEP project to support TNAs of additional countries in 2014–2015.

UNEP is implementing the new round of TNAs with objectives that go beyond identifying technology needs. The TNAs lead to the development of a national Technology Action Plan (TAP) that prioritizes technologies, recommends an enabling framework for the diffusion of these technologies, and facilitates identification of technology transfer projects and their links to financing sources.

The TNA process at the national level[2]

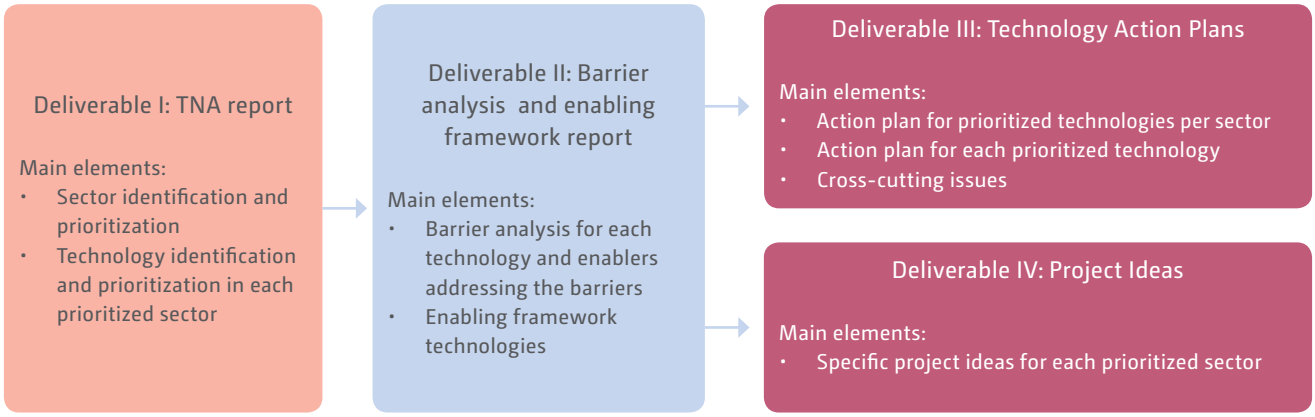
THE MAIN STEPS OF THE TNA PROCESS

How the process is carried out at the national level

The goal of a TNA is to identify technologies for mitigation and adaptation that also support a country's development objectives. To achieve this goal, the TNA process contains the following key steps (see Figure 1 below):

(a) To identify key priorities based on a country's long term vision on climate and development;
(b) To identify strategic sectors or areas to support these priorities;
(c) To prioritize technologies for mitigation and adaptation within the prioritized sectors;
(d) To identify barriers to, and enabling framework for, development and transfer of these technologies;
(e) To formulate technology action plans (TAPs) of projects, programmes or strategies;
(f) To prepare specific project ideas for each prioritized sector.

Figure 1. **Main country deliverables from the second round of TNAs and their relations**

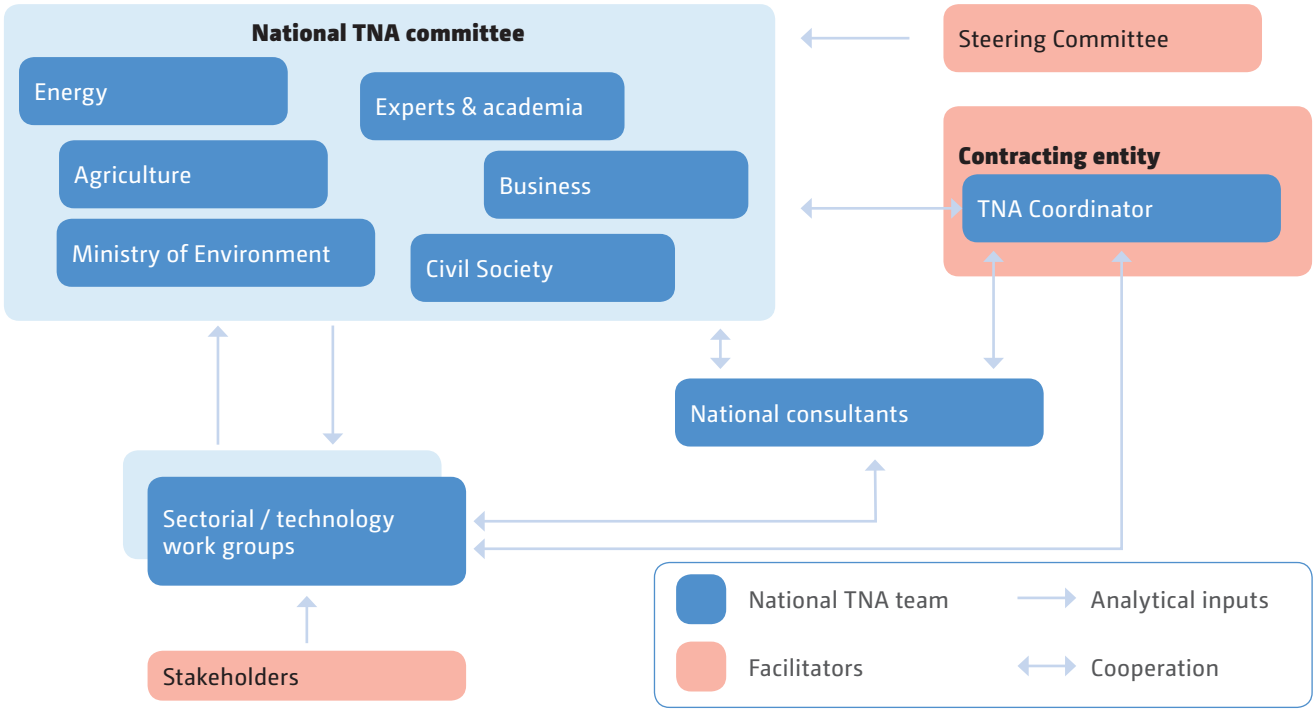


2 The content of the section "TNA process at the national level" (pages 3–6) is based on the information, compiled and synthesized from the reports of 31 Parties which participated in the current global TNA project between 2010 and 2013. The regional distribution of the 31 Parties is as follows: 10 Parties from Africa, 10 Parties from Asia, 3 Parties from Eastern Europe, 8 Parties from Latin America and the Caribbean region.

STAKEHOLDER INVOLVEMENT

Most TNA reports mentioned the type and involvement of stakeholders, although not all TNA reports identified the roles of the stakeholders. Stakeholders were mostly involved in setting the selection criteria for technology needs, selecting and prioritizing sectors and technologies, and identifying barriers and enablers. Possible roles of stakeholders involved in conducting TNA reports are shown in Figure 2.

Figure 2. Institutional arrangements of the TNA process



CRITERIA AND METHODS USED TO PRIORITIZE TECHNOLOGY NEEDS

In most TNA reports, the criteria used to select and prioritize the technology needs were influenced by development-related concerns. Some Parties sought compatibility between climate protection and economic and social goals, such as economic growth, improved living standards, health and poverty reduction.

In order to find suitable technologies offering GHG emission reduction and adaptation benefits in the context of sustainable development, the methods used to prioritize technology needs included multi-criteria decision analysis (MCDA), the analytical hierarchy process, cost-benefit and risk-benefit analyses, optimization models, as well as questionnaire surveys, interviews and workshops with stakeholders.

MCDA was used for prioritizing technologies and measures for mitigation and adaptation, because most Parties considered it a suitable approach to evaluate issues involving various stakeholders and trade-offs between multiple and conflicting objectives. These assessments can be difficult to quantify and a degree of uncertainty exists. MCDA is therefore appropriate to determine to what extent a sector or technology contributes to GHG emission reduction and/or adaptation benefits, while contributing to sustainable development.

PRIORITIZED SECTORS IN TNA REPORTS

Energy was the most prioritized sector for technology needs for mitigation, followed by agriculture and forestry, and waste sectors[3]. Within the energy sector, the sub-sectors most prioritized were energy industries and transport, respectively.

Agriculture was the most prioritized sector for technology needs for adaptation, followed by water, infrastructure, climate observation and human health. Parties did not prioritize sub-sectors for adaptation. The sectors identified by most non-Annex I Parties in their second round of TNAs are shown in Figures 3 and 4.

Figure 3. **Prioritized mitigation sectors**
(Percentage of all Parties)

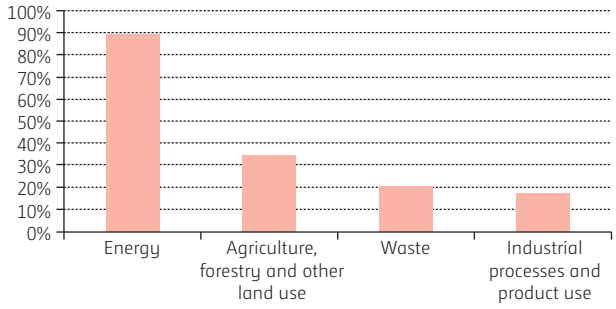
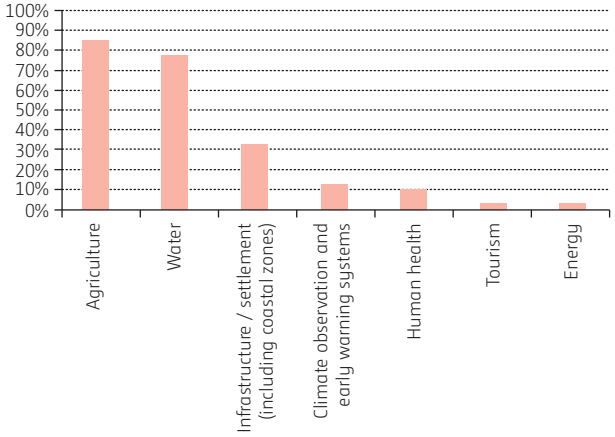


Figure 4. **Prioritized adaptation sectors**
(Percentage of all Parties)



PRIORITIZED TECHNOLOGIES IN TNA REPORTS

Most mitigation technology options that were prioritized as part of the sub-sector energy industries were focused on energy production.

Most adaptation technology options prioritized as part of the sector agriculture aimed at crop management, mainly crop diversification and new crop varieties, sprinkler and drip irrigation, and drought-resistant crop varieties. An overview of the prioritized technologies[4] is provided by Figures 5 and 6.

Figure 5. **Proritized technologies in the sub-sector energy industries**
(Percentage of all prioritized technologies for energy industries)

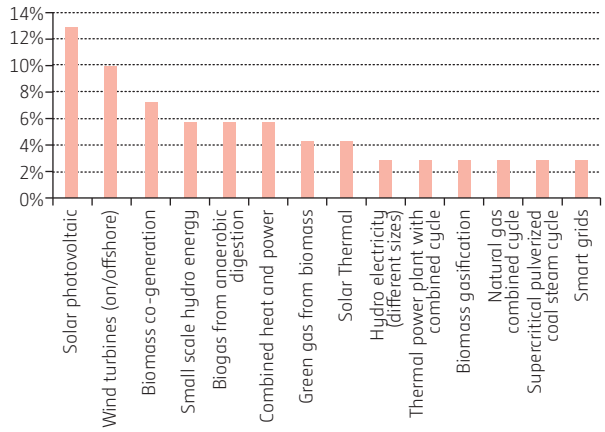
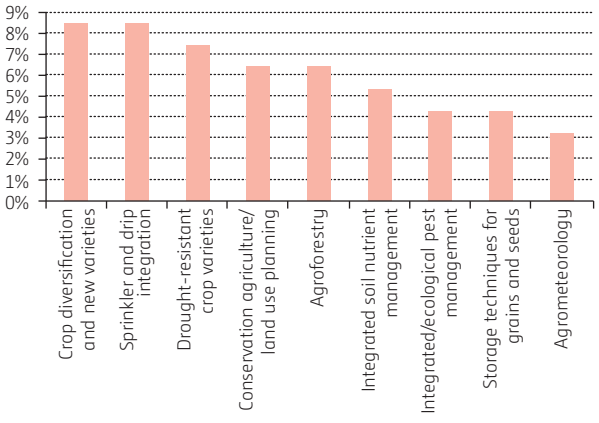


Figure 6. **Prioritized technologies in crop management**
(Percentage of all prioritized technologies for crop management)



3 The classification of mitigation sectors was based on the *2006 IPCC Guidelines for National Greenhouse Gas Inventories – Overview, page 6*. The classification of adaptation sectors was based on the *2007 IPCC Synthesis Report on Climate Change, page 57.*

4 The classification of technologies was based on the *2010 Handbook for Conducting Technology Needs Assessments for Climate Change, Annex 7, Table A7-1 Indicative list of technologies for mitigation, and Table A7-2 Indicative list of technologies for adaptation*, UNDP and UNFCCC.

BARRIER ANALYSIS AND ENABLING FRAMEWORK

Non-Annex I Parties analysed and identified their TNAs barriers. The main barriers to technology transfer identified in the mitigation area were: economical and financial; policy, legal and regulatory; technical; and market failure and imperfection. The main barriers to technology transfer identified in the adaptation area were: economical and financial; policy, legal and regulatory; market failure and imperfection; and human skills. The barriers to technology transfer were further identified at the sectoral level. Figures 7 and 8 provide an overview of the barriers identified for the most commonly prioritized sectors in mitigation and adaptation: energy and agriculture.

Parties also indicated that the existing in-country capacities are insufficient to address the transfer of ESTs, and many Parties were able to identify the needs for building in-country capacities in their TNA reports. The most commonly identified capacity-building needs were in the areas of information and awareness, development of human resources, institutional and organizational, technical skills, and policy and programme development.

Figure 7. **Types of barriers identified within the energy sector**
(Percentage of all Parties)

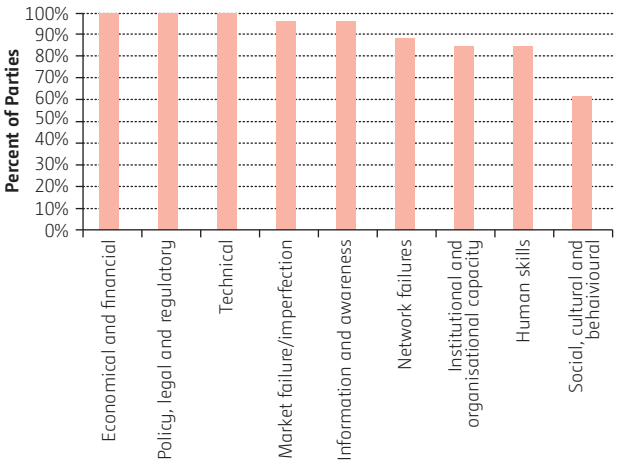
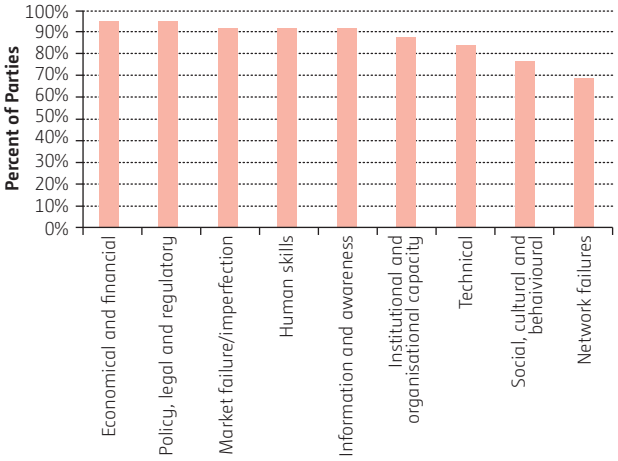


Figure 8. **Types of barriers identified within the agriculture sector**
(Percentage of all Parties)



TNA results - what are the successes and challenges of their implementation?[5]

PROJECT IDEAS AND IMPLEMENTATION OF TNA RESULTS

Numerous project ideas including strategies, policies, programmes and project proposals have been developed as outcomes of the TNA process since 1999. These project ideas appear to be consistent with the national development priorities of countries, and further work is planned in relation to their funding and implementation. However, the number of sound project proposals is very small compared to the number of project ideas reported by Parties in their TNAs.

It seems to be a real challenge to propose projects in a way that makes them viable and attractive to the financial sector. Projects that have been implemented should serve as examples to help create a future model for implementing the results of TNAs.

SUCCESS FACTORS AND CHALLENGES IN THE IMPLEMENTATION OF TNAS

Two surveys were undertaken by the UNFCCC in 2010 and 2013 to collect information on the status of implementation of the results of TNAs prepared since 1999. Based on the responses received from 23 non-Annex I Parties which participated in the two surveys, the following success factors and challenges were identified as lessons learned:

Lessons learned:

Success factors that facilitated implementation of the project proposals from the TNA, as identified by Parties in the survey:

(a) Availability of domestic and/or international funding.
(b) Involvement of relevant state authorities in the project development from the beginning.
(c) Ability to reach political and institutional consensus when deciding on implementation priorities.
(d) "High priority" status given by the government and/or municipality of the proposed strategies, programmes, projects, or technologies.
(e) A pro-active, knowledgeable project champion.

Challenges that prevented projects from implementation, as identified by Parties in the survey:

(a) Some TNA reports were prepared by teams of consultants, with no state authority involved in proposing the projects. This resulted in the lack of ownership of state authorities and led to a lack of interest in implementing the results.
(b) Environmental issues not considered a priority for the government.
(c) A high investment and/or low rate of return of the proposed projects.
(d) TNAs reported low visibility of the projects to possible donors.
(e) Low attractiveness of some innovative technologies, due to their high cost.

5 The content of the section "TNA results – what are the successes and challenges of their implementation?" (page 7) is based on the Second synthesis report on technology needs identified by Parties not included in Annex I to the Convention (FCCC/SBSTA/2009/INF.1) which complied and synthesized TNA reports of 69 Parties which participated in the initial round of TNAs.

Reference

- TEC Brief "Possible integration of the TNA process with NAMA and NAP processes" (October 2013)
- TEC Brief "Using roadmapping to facilitate the planning and implementation of technologies for mitigation and adaptation" (October 2013)
- Synthesis report on technology needs identified by Parties not included in Annex I to the Convention (FCCC/SBSTA/2006/INF.1)
- Second synthesis report on technology needs identified by Parties not included in Annex I to the Convention (FCCC/SBSTA/2009/INF.1)
- Third synthesis report on technology needs identified by Parties not included in Annex I to the Convention (FCCC/SBSTA/2013/INF.7)
- Handbook for conducting technology needs assessment for climate change. United Nations Development Programme (November 2010)

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About the Technology Executive Committee

The Technology Executive Committee (TEC) is the policy component of the Technology Mechanism established by the Conference of the Parties (COP) in 2010 through its decision 1/CP.16 to facilitate the implementation of enhanced action on technology development and transfer to support action on mitigation and adaptation. Along with the Climate Technology Centre and Network (CTCN), the other component of the Technology Mechanism, the TEC is mandated to facilitate the effective implementation of the Technology Mechanism, and to undertake work on areas including technology needs, policies and programme priorities for technology transfer related activities, enabling environments for and barriers to the development and transfer of technology, and technology roadmaps and action plans.

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