What are the technology needs of developing countries?

Why this UNFCCC flyer?

The purpose of this flyer is to give technology stakeholders a snapshot of 12 key findings from the *Third synthesis report on technology needs identified by Parties not included in Annex I to the Convention*, which was prepared by the secretariat in 2013. By reading this flyer, stakeholders will:

- Be informed of the technology needs of the developing countries that recently undertook technology needs assessments (TNAs);
- Be made aware of technology action plans (TAPs) and project ideas prepared by developing countries, which are seeking support for implementation;
- Develop a greater understanding of the TNA process and its results and understand how a TNA could be beneficial to their country.

Finally, this flyer will allow stakeholders to further their understanding of how undertaking TNAs and supporting the results of the TNAs can enhance action on the development and transfer of technologies, therefore supporting enhanced action on climate change.

12 Twelve key findings on the technology needs of developing countries

By way of a technology needs assessment (TNA), developing countries identify and determine their technology priorities for 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 an important process that allows developing countries to self-determine their technology needs in line with their national development priorities. **Since 1999, more than 85 developing countries have undertaken TNAs.**

As part 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 and project ideas are tangible proposals to address the technology needs of these countries. Implementing the TAPs and project ideas, including by linking them with processes such as 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.

Recently, 31 developing countries completed TNAs and prepared TNA reports. These Parties participated in the global TNA project, which had the objective of providing targeted financial and technical support to assist developing country Parties in developing or updating their TNAs. The project was supported by the Global Environment Facility (GEF) under the Poznan strategic programme on technology transfer and was implemented by the United Nations Environment Programme (UNEP) in collaboration with the UNEP Risoe Centre. To capture the important information contained in these reports, the UNFCCC secretariat prepared the *Third synthesis report on technology needs identified by Parties not included in Annex I to the Convention* (hereinafter referred to as the third synthesis report).

1 RECENTLY, 31 DEVELOPING COUNTRIES COMPLETED OR UPDATED TECHNOLOGY NEEDS ASSESSMENTS

Recently, 31 developing country Parties completed TNAs; prioritizing technology needs, identifying barriers and enablers and developing TAPs and project ideas. Of these 31 Parties, there were nine least developed countries, three small island developing States and three countries with economies in transition.

Figure 1: **Map of participating Parties**
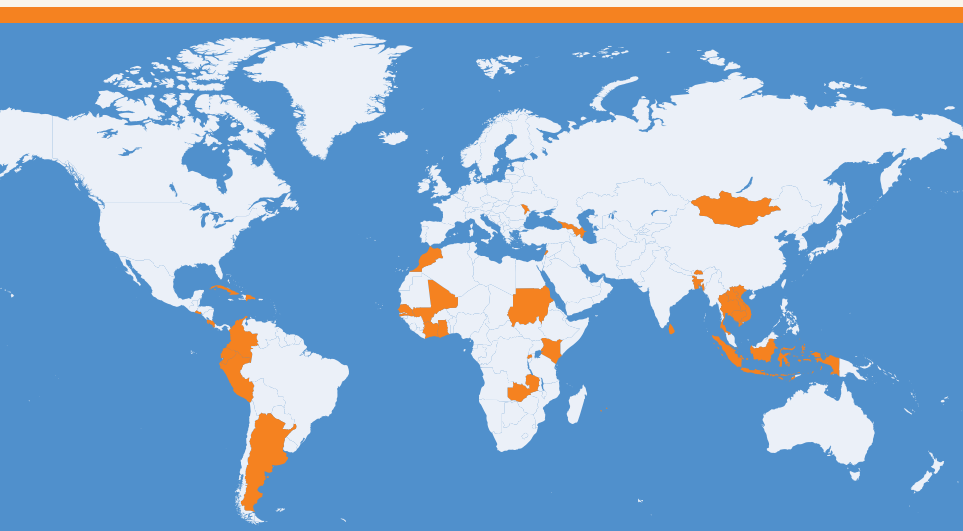
PARTICIPATING PARTIES BY REGION:

Africa: Côte d'Ivoire, Ghana, Kenya, Mali, Mauritius, Morocco, Rwanda, Senegal, Sudan, Zambia;

Asia-Pacific: Bangladesh, Bhutan, Cambodia, Indonesia, Lao People's Democratic Republic, Lebanon, Mongolia, Sri Lanka, Thailand, Viet Nam;

Eastern Europe: Azerbaijan, Georgia, Republic of Moldova;

Latin America and Caribbean: Argentina, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Peru.

It may be noted that in April 2013 the GEF Council approved a project by UNEP supporting an additional 24 developing countries to undertake or update their TNAs.

2   FOR MOST PARTIES, THE COORDINATION OF THE TECHNOLOGY NEEDS ASSESSMENTS WAS A HIGH-LEVEL PROCESS CARRIED OUT BY A NATIONAL MINISTRY

All 31 Parties mentioned involving stakeholders in the TNA process, particularly through workshops and expert consultation. Commonly identified stakeholders were national government representatives, the academic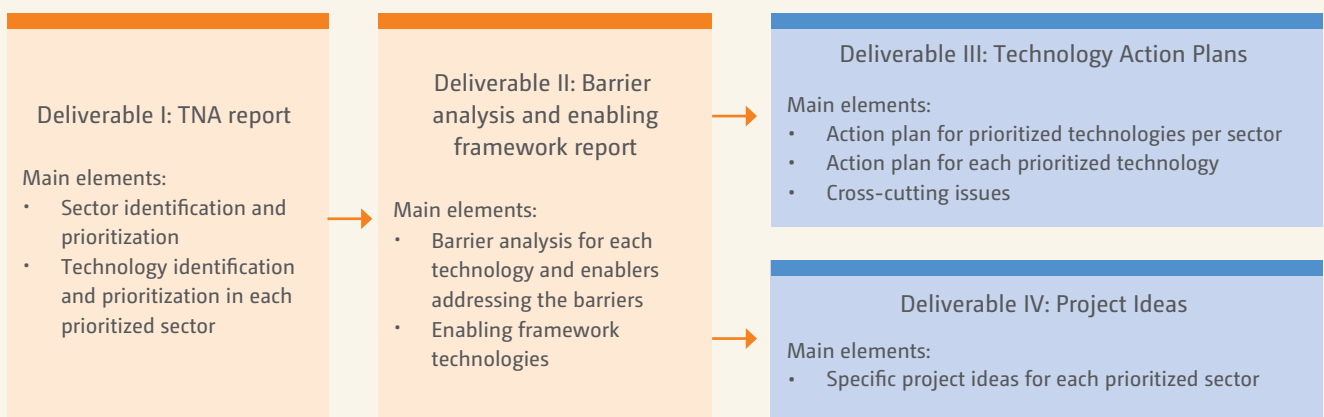 sector, the private sector, independent consultants and non-governmental organizations. However, only a few of the Parties reported involving stakeholders from the finance community. Most of the Parties stated their national development priorities as a starting point for their TNA process.

3   DETAILED REPORTS COVERING THE FULL TECHNOLOGY NEEDS ASSESSMENT PROCESS WERE PREPARED BY PARTIES

Parties prepared their TNAs in a manner that was consistent with the guidance contained in the *Handbook for Conducting Technology Needs Assessments for Climate Change* written by the United Nations Development Programme (UNDP) and in related guidebooks and tools prepared by UNDP, UNEP and the UNEP Risoe Centre. The TNA reports often included separate reports for each step of the TNA process, including TNA, barrier analysis and enabling framework, TAP and project idea reports.

Figure 2: **Main Party deliverables from the technology needs assessment project**

Deliverable I: TNA report

Main elements:
- Sector identification and prioritization
- Technology identification and prioritization in each prioritized sector

Deliverable II: Barrier analysis and enabling framework report

Main elements:
- Barrier analysis for each technology and enablers addressing the barriers
- Enabling framework technologies

Deliverable III: Technology Action Plans

Main elements:
- Action plan for prioritized technologies per sector
- Action plan for each prioritized technology
- Cross-cutting issues

Deliverable IV: Project Ideas

Main elements:
- Specific project ideas for each prioritized sector

Source: United Nations Environment Programme Risoe Centre.

4   TECHNOLOGY NEEDS ASSESSMENT REPORTS ON ADAPTATION TO THE ADVERSE EFFECTS OF CLIMATE CHANGE WERE PREPARED BY ALL 31 PARTIES
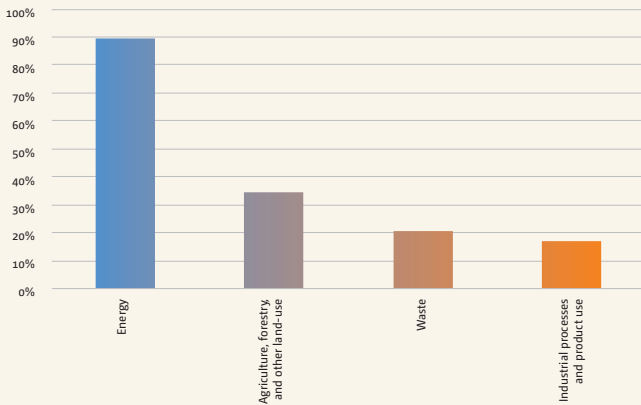
Furthermore, 29 of the 31 Parties prepared TNA reports on the mitigation of greenhouse gases.

## 5 THE MOST PRIORITIZED SECTORS WERE THE ENERGY AND AGRICULTURE SECTORS

For mitigation, almost all of the Parties prioritized the energy sector. The most prioritized subsectors of the energy sector were energy industries and transport.

For adaptation, most Parties prioritized the agriculture and water sectors.

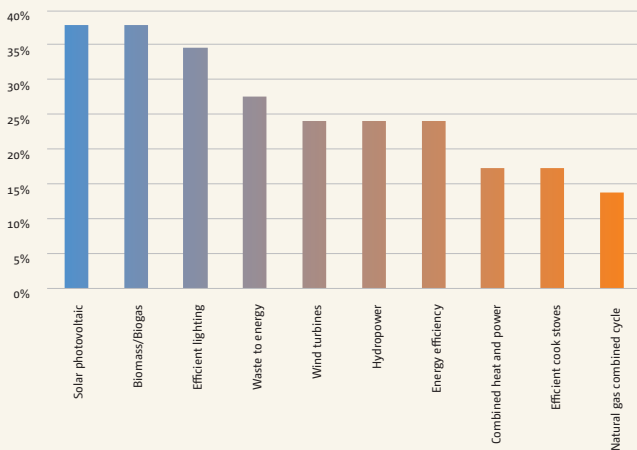**Figure 3:** Prioritized sectors for mitigation (percentage of Parties)

Figure 4: Prioritized sectors for adaptation (percentage of Parties)
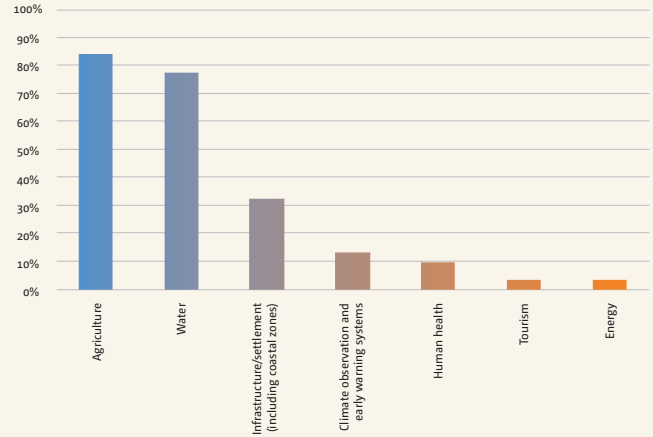
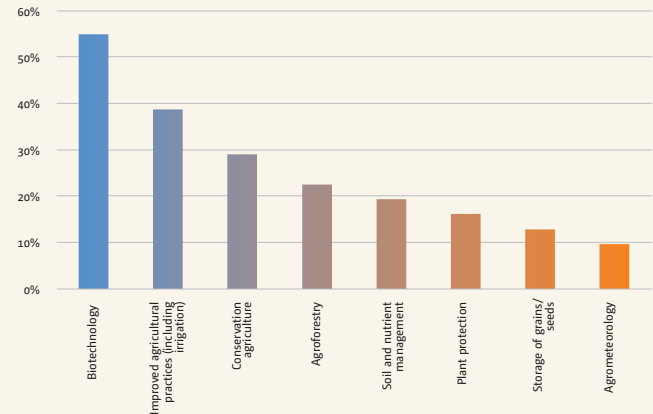## 6 MANY PRIORITIZED TECHNOLOGIES WERE RELATED TO ELECTRICITY GENERATION AND CROP MANAGEMENT

For mitigation, many of the technologies prioritized were related to electricity generation. Solar photovoltaic and biomass/biogas electricity generation technologies were the most prioritized electricity generation technologies, followed by efficient lighting, waste to energy, wind turbines and hydropower.

For adaptation, many of the technologies prioritized were related to crop management. Biotechnologies, including technologies related to crop improvement, new varieties and drought-resistant, salient-tolerant and short-maturing varieties, were the most prioritized technologies.
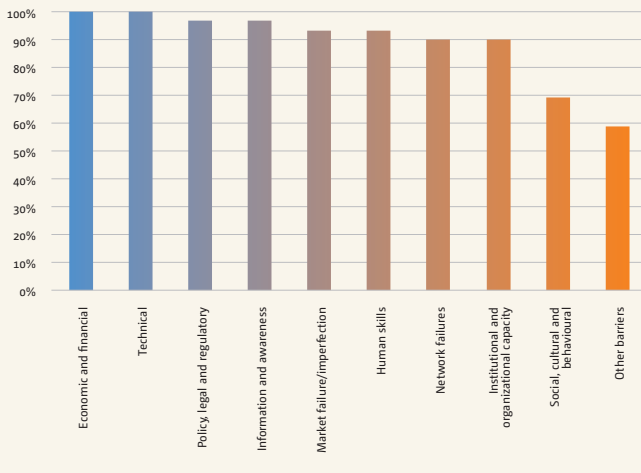
Figure 5: Prioritized technologies for the energy industries subsector (percentage of Parties)

Figure 6: Prioritized technologies for the agriculture sector (percentage of Parties)

7 BARRIERS MOST COMMONLY REPORTED WERE (I) ECONOMIC AND FINANCIAL AND (II) TECHNICAL
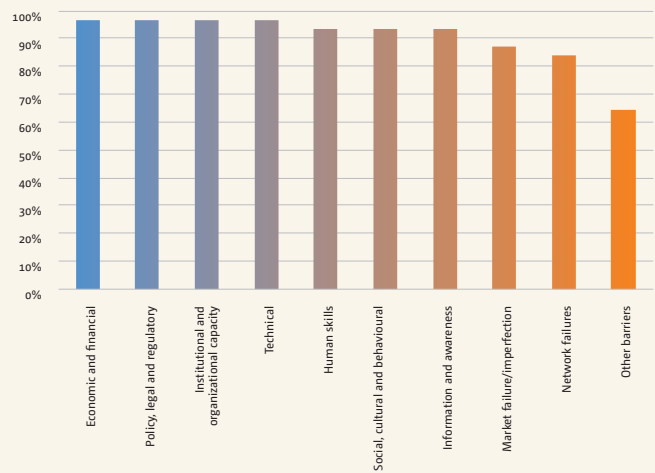
For mitigation, the most commonly reported barriers to the development and transfer of the prioritized technologies were (i) economic and financial and (ii) technical barriers. Within the economic and financial barrier category, most of the Parties identified inappropriate financial incentives and disincentives as the main barrier. In the technical barrier category, many of the Parties identified system constraints and inadequate standards, codes and certification as the main barriers.

For adaptation, almost all of the Parties identified the following types of barriers to the development and transfer of the prioritized technologies: economic and financial; policy, legal and regulatory; institutional and organizational capacity; and technical. Within the first two categories, Parties identified the lack of or inadequate access to financial resources and an insufficient legal and regulatory framework as the most common barriers.

Figure 7: Reported barriers to the development and transfer of technologies for mitigation (percentage of Parties)

Figure 8: Reported barriers to the development and transfer of technologies for adaptation (percentage of Parties)

8 ENABLERS MOST COMMONLY REPORTED TO ADDRESS IDENTIFIED BARRIERS WERE OF A FINANCIAL NATURE

For mitigation, the most commonly mentioned enabler to address identified barriers was the measure to provide or expand financial incentives for the prioritized technology. For adaptation, the most commonly mentioned enabler to address identified barriers was the measure to increase the financial resources available for the technology.

Parties proposed to increase the financial resources by introducing or increasing the allocation for the technology in the national budget or by identifying and creating financial schemes, funds, mechanisms or policies.

9 TECHNOLOGY ACTION PLANS AND PROJECT IDEAS WERE DEVELOPED BY ALMOST ALL PARTIES

The measures in the TAPs looked to address barriers in categories such as: economic and financial; policy, legal and regulatory; information and awareness; human skills; institutional and organizational capacity; technical; and infrastructure. The total accumulative estimated budget of Parties for the implementation of their TAPs was USD 5.2 billion for mitigation and USD 2.4 billion for adaptation. However, the size of Parties' budgets varied significantly.

The total accumulative estimated budget of Parties for the implementation of their project ideas was USD 12.5 billion for mitigation and USD 12.2 billion for adaptation. However, as for the TAPs, the size of the individual budgets varied significantly between Parties.

WHAT ARE TAPs?

Technology action plans (TAPs) are a group of measures to address the identified barriers to the development and transfer of a prioritized technology

Examples of technology action plans

Azerbaijan

TAP to address barriers to the development and transfer of a flood warning technology

Measures include:

- Investing in the procurement of high-quality devices used in conducting water source surveys;
- Providing knowledge and understanding on how the system operates to both managers and operators.

Total estimated budget: USD 2.17 million

Kenya

TAP to address barriers to the development and transfer of a solar dryer technology

Measures include:

- Setting up local assembly industries for solar dryer parts and components;
- Enhancing the research and development of the solar dryer technology;
- Formulating an enabling policy, legal and regulatory framework for the solar dryer technology.
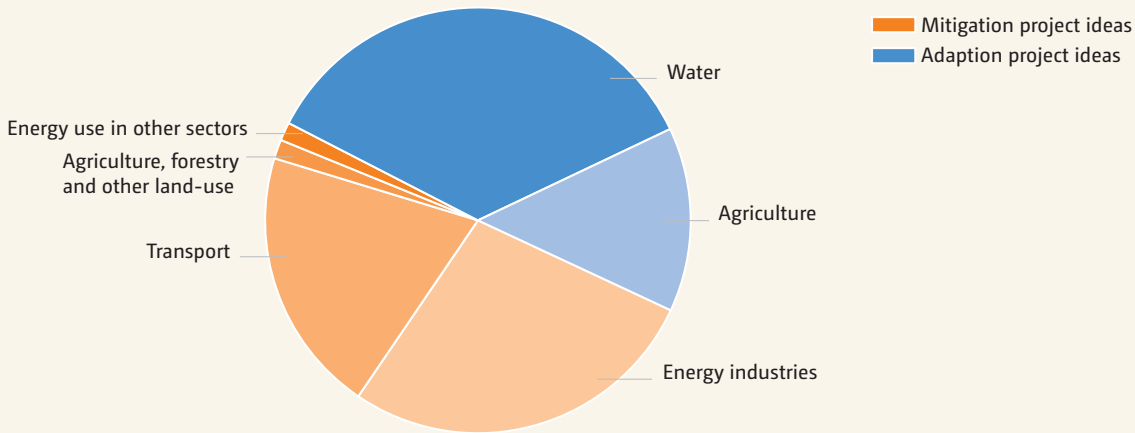
Total estimated budget: USD 29.38 million

WHAT ARE PROJECT IDEAS?

Project ideas are concrete actions for the implementation of a prioritized technology

Examples of project ideas

Bangladesh

Project idea: Establish a special agricultural research and development centre

- Technology: Climate-resilient crop production;
- The project's objective is to develop a research centre to develop technologies, identify technological needs and establish coordination mechanisms.

Total estimated budget: USD 6.25 million

Sri Lanka

Project idea: Integrate non-motorized transport methods into the regular public transport system

- Technology: Transport modal change;
- Activities include: infrastructure measures; amendments to the national policies and legislation, and research and development.

Total estimated budget: USD 28.42 million over a three-year timescale

Figure 9: Budget for project ideas identified by Parties as part of their technology needs assessments by subsector for mitigation and by sector for adaptation

- Mitigation project ideas
- Adaption project ideas

Water

Energy use in other sectors

Agriculture, forestry
and other land-use

Transport

Agriculture

Energy industries

10 INTERLINKAGES BETWEEN TECHNOLOGY NEEDS ASSESSMENTS AND OTHER PROCESSES UNDER AND OUTSIDE THE CONVENTION WERE IDENTIFIED BY OVER HALF OF THE PARTIES

Many of these Parties:

(i)   Noted that their TNA drew upon their completed NAMAs and national adaptation programmes of action, or;

(ii)   Identified the outputs of their TNAs as inputs to the work on their national communications, NAMAs or NAPs.

Most of the Parties also reported that they considered the TNA process to be part of a bigger picture. Parties stated that TNAs complement national policies and plans for mitigating greenhouse gas emissions and adapting to climate change. A few of the Parties also made clear references to the Technology Mechanism in relation to supporting the implementation of the results of TNAs.

11 THESE TECHNOLOGY NEEDS ASSESSMENT REPORTS ARE A MAJOR EVOLUTION FROM THOSE SYNTHESIZED IN THE SECOND SYNTHESIS REPORT IN 2009

In the TNA reports synthesized in the third synthesis report, almost all of the Parties included TAPs. This is a major evolution from the TNA reports synthesized in the *Second synthesis report on technology needs identified by Parties not included in Annex I to the Convention* (hereinafter referred to as the second synthesis report), prepared in 2009, in which Parties elaborated only on the identification of possible next steps to address identified barriers.

In addition, in the TNA reports synthesized in the third synthesis report almost all of the Parties included detailed project ideas. This contrasts with the TNA reports synthesized in the second synthesis report, prepared in 2009, in which only some of the Parties identified more generic project ideas.

12 THE RESULTS OF THE TECHNOLOGY NEEDS ASSESSMENTS ARE READY FOR IMPLEMENTATION

The TNA reports prepared by the 31 participating Parties are detailed documents that reflect the in-depth and profound TNAs that these Parties performed. In these documents, Parties reported on their technology priorities to mitigate greenhouse gases and adapt to the adverse effects of climate change. Furthermore, Parties also identified TAPs to address barriers that inhibit the implementation of their prioritized technologies. In addition, Parties prepared project ideas, which are concrete actions to implement these technologies.

Implementing these TAPs and project ideas and encouraging other developing countries to undertake TNAs are clear ways for enhancing the development and transfer of climate-friendly technologies. Through the implementation of these plans and projects, including by linking them with processes such as NAMAs and NAPs, it is possible to enhance action on climate change.

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Further information

For further information on the results of the TNAs prepared by the 31 participating developing country Parties, please refer to the *Third synthesis report on technology needs identified by Parties not included in Annex I to the Convention*, document FCCC/SBSTA/2013/INF.7. Available at <unfccc.int/ttclear/TNA>.

Other references
Second synthesis report on technology needs identified by Parties not included in Annex I to the Convention, document FCCC/SBSTA/2009/INF.1. Available at <unfccc.int/ttclear/TNA>.

Synthesis report on technology needs identified by Parties not included in Annex I to the Convention, document FCCC/SBSTA/2006/INF.1. Available at <unfccc.int/ttclear/TNA>.

The TNA reports of the 31 participating Parties may be found at <unfccc.int/ttclear/TNA>.

United Nations Development Programme. 2010. *Handbook for Conducting Technology Needs Assessments for Climate Change*. Available at <http://unfccc.int/ttclear/sunsetcms/storage/contents/stored-file-20130321154847356/TNA_Handbook_Nov2010.pdf>.