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**Development and transfer of technologies and report of the Technology
Executive Committee**

Report on the experience-sharing workshop on technology needs assessments

Note by the secretariat

Summary

An experience-sharing workshop on technology needs assessments (TNAs) was organized by the United Nations Environment Programme, in collaboration with the secretariat, and held in Bangkok, Thailand, from 10 to 12 September 2012. The workshop provided an opportunity for the participants to share their experiences in conducting TNAs, preparing technology action plans and reporting thereon under the global TNA project supported by the Global Environment Facility. National TNA coordinators from 36 countries supported by the global TNA project and the Technology Executive Committee (TEC) were invited to participate in the workshop. The workshop also provided an opportunity for an exchange of views with representatives of the private sector and the financial community on possible ways of enhancing access to funding for the implementation of the results of TNAs, and for a discussion with members of the TEC on the challenges of the TNA process and its contribution to existing national policies, plans and strategies, including the preparation of national communications, nationally appropriate mitigation actions, low-emission development strategies, national adaptation plans and the United Nations Millennium Development Goals.

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I. Introduction

A. Mandate

1. The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its thirty-sixth session, recalled the conclusions of its thirty-fifth session requesting the secretariat, in collaboration with interested organizations, to organize workshops, subject to the availability of resources, on technology needs assessments (TNAs) in 2012 and noted that the United Nations Environment Programme (UNEP), in collaboration with the secretariat, planned to organize a workshop on TNAs in the second half of 2012. The SBSTA requested the secretariat to report on the outcomes of the workshop and to make the report available to the SBSTA for consideration at its thirty-seventh session.¹

B. Scope of the note

2. This document contains a summary of the presentations made and the panel and general discussions that took place during the workshop on TNAs organized by UNEP referred to in paragraph 1 above. Ideas for possible further activities in relation to TNAs that were suggested by participants during the workshop could be used to inform Parties' deliberations on the future of the TNA and technology action plan (TAP) process in the light of the Cancun Agreements and the outcome agreed at the United Nations Climate Change Conference in Durban in relation to various relevant activities.

C. Possible action by the Subsidiary Body for Scientific and Technological Advice

3. The SBSTA may wish to take note of the information contained in this document and provide further guidance on the TNA process in the context of the implementation of the Technology Mechanism, established by decision 1/CP.16, as well as other relevant activities decided on pursuant to the Cancun Agreements and the outcome agreed at the United Nations Climate Change Conference in Durban.

D. Background

1. Technology needs assessments under the UNFCCC

4. In accordance with the framework for meaningful and effective actions to enhance the implementation of Article 4, paragraph 5, of the Convention, the purpose of TNAs is to assist in identifying and analysing priority technology needs.

5. Those needs can form the basis for a portfolio of environmentally sound technologies (ESTs), projects and programmes to facilitate the transfer of, and access to, ESTs and know-how in the implementation of Article 4, paragraph 5, of the Convention. TNAs are the centrepiece of the work on technology transfer and reflect the concept of a country-driven approach to that work. They are essential in bringing together the relevant stakeholders at the national level to identify technology needs and to develop plans of action for meeting those needs.

¹ FCCC/SBSTA/2012/2, paragraph 35.

6. Since the seventh session of the Conference of the Parties (COP), developing country Parties have been assessing and prioritizing their technology needs in the areas of climate change mitigation and adaptation by means of an analysis that takes account of their national development plans and strategies. Through its interim financing for capacity-building in priority areas – enabling activities phase II (also known as ‘top-ups’) – the Global Environment Facility (GEF) has provided funding for 92 Parties not included in Annex I to the Convention (non-Annex I Parties) to conduct TNAs, with 78 of those TNAs having been supported by the United Nations Development Programme (UNDP) and 14 by UNEP. Some 68 TNA reports have been submitted to the secretariat and are available at the UNFCCC technology information clearing house, TT:CLEAR.²

7. To help Parties to conduct their TNAs, the handbook *Conducting Technology Needs Assessments for Climate Change* was prepared by UNDP, in cooperation with the Climate Technology Initiative (CTI) and with input from a wide range of multilateral agencies and country experts, and published in July 2004.³ In 2010, UNDP, in collaboration with the secretariat, the Expert Group on Technology Transfer (EGTT) and CTI, developed and published the updated *Handbook for Conducting Technology Needs Assessments for Climate Change* (hereinafter referred to as the updated TNA handbook).⁴ It provides specific guidance on identifying technology needs for the mitigation of and adaptation to climate change, including the development of two innovative support tools TNAssess⁵ and ClimateTechWiki.⁶

8. In response to the request made by the COP in decision 4/CP.13,⁷ the GEF elaborated a strategic programme to scale up the level of investment for technology transfer to help developing countries address their needs for ESTs. The COP, at its fourteenth session, welcomed⁸ the GEF Strategic Program on Technology Transfer (renaming it the Poznan strategic programme on technology transfer) as a step towards scaling up the level of investment in the transfer of ESTs to developing countries, while recognizing the contribution that the programme could make to enhancing technology transfer activities under the Convention. The programme consists of three funding windows, with funding totalling USD 50 million, for: (a) conducting TNAs; (b) piloting priority technology projects linked to TNAs; and (c) disseminating GEF experience and successfully demonstrated ESTs.

2. The global technology needs assessment project under the Poznan strategic programme on technology transfer

9. The TNA project concept, under window one of the Poznan strategic programme, was approved by the Least Developed Countries Fund/Special Climate Change Fund (SCCF) Council in April 2009. On the basis of that TNA project concept UNEP developed a full project document, which was endorsed by the Chief Executive Officer (CEO) of the GEF in 2009, and the implementation of the TNA project started in October 2009. Funding for the project via the technology transfer window under SCCF totals USD 9 million.

² See <<http://unfccc.int/tclear/jsp/CountryReports.jsp>>.

³ Available at <http://unfccc.int/tclear/pdf/TNA/UNDP/TNA%20Handbook_Final%20version.pdf>.

⁴ UNDP. 2009. *Handbook for Conducting Technology Needs Assessments for Climate Change*. Available at <http://unfccc.int/tclear/pdf/TNAHandbook_9-15-2009.pdf>.

⁵ Software tool to support the process of taking decisions on prioritized technologies for mitigation and adaptation in a country. Available at <http://portal.climatechwiki.org/index_tnassess.html>. [pls confirm correct link – it doesn’t seem to work]

⁶ Online database which provides basic information on ESTs, including specific project examples. Available at <<http://climatechwiki.org>>.

⁷ Decision 4/CP.13, paragraph 3.

⁸ Decision 2/CP.14, paragraph 1.

10. The current TNA project aims to provide targeted financial and technical support to assist 36 developing countries in developing or updating their TNAs and to support them in preparing their TAPs. The project seeks to use methodologies from the updated TNA handbook and to provide feedback as a means of fine-tuning the methodologies through an iterative process.

11. Key progress that has been achieved during the TNA reporting period, as reported by the GEF in its report to the COP at its eighteenth session,⁹ includes the following:

(a) Thirty-six countries are participating in the TNA project:

(i) Côte d'Ivoire, Ethiopia, Ghana, Kenya, Mali, Mauritius, Morocco, Rwanda, Senegal, Sudan and Zambia in Africa (11);

(ii) Azerbaijan, Bangladesh, Bhutan, Cambodia, Georgia, Indonesia, Kazakhstan, Lao People's Democratic Republic, Lebanon, Mongolia, Nepal, Republic of Moldova, Sri Lanka, Thailand and Viet Nam in Asia and the Commonwealth of Independent States (CIS) (15);

(iii) Argentina, Bolivia (Plurinational State of), Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala and Peru in Latin America and the Caribbean (10);

(b) A Project Steering Committee (PSC) has been constituted by UNEP to assess the project's progress and to plan upcoming activities. The PSC consists of representatives of the EGTT (until 2010), the UNFCCC secretariat, UNEP, UNDP, the United Nations Industrial Development Organization (UNIDO), the World Bank, the UNEP Risoe Centre on Energy, Climate and Sustainable Development (URC) and the GEF Secretariat. The last two PSC meetings were held in November 2011 and May 2012;

(c) Building on the foundations established in most of the participating countries, technical support and stakeholder engagement are under way. During the reporting period, a second round of regional capacity-building workshops was held in February 2012 for countries in Africa, Asia and Latin America;

(d) With regard to the progress made in the preparation of TNAs, draft and final TNA reports were submitted by 12 countries (Bangladesh, Cambodia, Costa Rica, Côte d'Ivoire, Georgia, Indonesia, Mali, Morocco, Peru, Senegal, Thailand and Viet Nam) in 2011. TAPs have been submitted by six countries (Costa Rica, Côte d'Ivoire, Indonesia, Mali, Morocco and Thailand). For the remainder of the participating countries, UNEP requested an extension of the TNA project up to April 2013;

(e) TNAs and TAPs have been recognized as contributing to existing national policies, plans and strategies, including nationally appropriate mitigation actions (NAMAs), low-emission development strategies (LEDS) and the United Nations Millennium Development Goals. Linkages between the TNA project and other climate change related projects under the UNFCCC, such as the preparation of national communications, have also been strengthened;

(f) The TNA project published material on TNA practices in 2011. Three guidebooks to support TNAs for adaptation, four sectoral guidebooks for mitigation and two financial guidebooks, one for mitigation and one for adaptation projects, were developed and published. A series of case studies entitled *Technology Transfer Perspectives*, covering technologies for adaptation and renewable energy, was published in November 2011 and is available on the TNA project's website,¹⁰

⁹ FCCC/CP/2012/6.

¹⁰ <<http://www.tech-action.org/perspectives.asp>>.

(g) The use of the updated TNA handbook in preparing or updating TNAs is referred to in decision 2/CP.14.¹¹ The handbook has been shared with the participating countries' project teams and is being used as the basic resource document on the general methodology for sector prioritization. A new guidebook on how to conduct barrier analysis and develop enabling frameworks has been developed as a supplement to the updated TNA handbook. A draft version of the guidebook was used for the first round of countries participating in the TNA project and, based on that experience, a final version of the guidebook was published in January 2012. The guidebook is available on the TNA project's website;¹²

(h) The first TNA project newsletter (TNA Newsletter), aimed at keeping countries and other stakeholders informed of the project's progress and sharing experiences, was published in June 2011. The second newsletter was released in October 2011, the third volume was published in November 2011 and distributed during COP 17 and the fourth newsletter was published in May 2012.

3. The Long-Term Program on Technology Transfer

12. In addition to its global TNA project supported as part of the Poznan strategic programme, since 2009 the GEF has also included support for TNAs in its Long-Term Program on Technology Transfer. A stand-alone national project including TNA activities which was established in India by UNDP and is entitled "Preparation of Third National Communication to the UNFCCC and Strengthening Institutional and Analytical Capacities on Climate Change" was approved by the GEF Council in the 2012 fiscal year. It is an innovative project aimed at realizing within one common framework India's national communication, biennial update report and TNA.

13. Furthermore, a project entitled "Establish Measurement and Verification System for Energy Efficiency in China" by the World Bank has been endorsed by the CEO of the GEF. The project includes extensive sectorial TNAs and the pilot implementation and monitoring of specific activities targeting prioritized climate technologies, particularly energy efficiency technologies.

II. Proceedings

14. The experience-sharing workshop on TNAs was organized by URC, in collaboration with the UNFCCC secretariat and the Asian Institute of Technology (AIT), and held in Bangkok, Thailand, from 10 to 12 September 2012.

15. The objectives of the workshop were:

- (a) To showcase best practices in conducting TNAs;
- (b) To get feedback from the participating countries on conducting TNAs, preparing TAPs and reporting thereon, thus allowing UNEP and URC to conduct internal evaluation;
- (c) To enhance the capacity of national TNA coordinators to develop project proposals;
- (d) To facilitate interaction between TNA country representatives and the funding community.

¹¹ Decision 2/CP.14, paragraph 2(b).

¹² <<http://tech-action.org/Guidebooks.asp>>.

16. The agenda for the workshop, prepared in consultation with representatives of UNEP, included five modules:

- (a) Inaugural session;
- (b) Module I: TAPs for mitigation and adaptation by sector;
- (c) Module II: The TNA–TAP process – experience-driven reflections on the state of the art;
- (d) Module III: Regional knowledge diffusion on TNA–TAP experiences and outputs by sector;
- (e) Module IV: From plans to actions – developing project proposals capable of attracting funding;
- (f) Module V: Training session on preparing and presenting project proposals for financing, led by the UNFCCC.

17. The experience-sharing workshop on TNAs was attended by 93 participants: 40 from non-Annex I Parties, two from Parties included in Annex I to the Convention, 14 representatives of intergovernmental and non-governmental organizations (NGOs), 15 representatives of United Nations organizations and 22 representatives of specialized agencies and related organizations.

III. Summary of discussions

A. Inaugural session

18. The workshop was opened by Dr. Wijarn Simachaya, Secretary-General of Thailand's Office of Natural Resources and Environmental Policy and Planning. He welcomed participants to Bangkok. He highlighted that finance, technology and capacity-building are key to implementing actions for the mitigation of and adaptation to climate change.

19. Ms. Wanna Tanunchaiwatana, a representative of the UNFCCC secretariat, presented the background and context of and expectations for the workshop. She highlighted the opportunity for national TNA coordinators to discuss and exchange views with the members of the Technology Executive Committee (TEC) participating in the workshop on the challenges facing and possible future of the TNA and TAP process. She indicated that the report on the workshop would be prepared for consideration by the SBSTA at its thirty-seventh session.

20. Mr. Said Irandoust, President of AIT, described the workshop as a good opportunity for participants to showcase best practices, share experiences and provide feedback aimed at enhancing their capacity.

21. Mr. Mark Radka, from UNEP, delivered the keynote address, describing technology transfer as “a broad, complex and unruly process” involving more than the transfer of high-tech equipment and including the sharing of knowledge and technical capabilities among communities of practice. He expressed the hope that the workshop would identify good practices adaptable to local situations and provide input to developing links between TNAs, LEDS and NAMAs and synergies among TNAs, the TEC and the Climate Technology Centre and Network (CTCN), noting that national context will be crucial in determining the outcome of TNAs.

B. Module I: TAPs for mitigation and adaptation by sector

22. Some workshop participants delivered presentations on their experiences in preparing and reporting on their TAPs for mitigation and adaptation. The presentations were made on a sectorial basis, highlighting the experiences of two countries with TAPs for adaptation and two countries with TAPs for mitigation.

23. Mr. Elhadji Diagne (Senegal) presented a TAP for adaptation to climate change in the agriculture sector of Senegal. Highlighting Senegal's dependence on rain-fed agriculture, he listed the priorities for action identified through the TAP: improvement of seed banks; intercropping; recognition and conservation of forage reserves; and assisted natural regeneration. He explained that seed banks had been prioritized for action and that a national programme had been established for the improvement of varieties of peanut and rice. He highlighted the importance of: creating incentives for investments through the tax regime; limiting the importation of seeds from other sources; quality control; a processing and distribution infrastructure; marketing; and systems for protecting intellectual property rights.

24. Mr. Surajate Boonya-Aroonnet (Thailand) presented a TAP for water resources management in Thailand, prioritizing: a network and management system for reservoirs; weather and hydrological prediction; flood and drought risk management; and early warning by means of Sensor Web environmental monitoring systems. He noted that the TAP distinguished between technology to be sourced externally and technology to be developed domestically. He highlighted the need to identify the best institutions conducting climate modelling to deliver early warning and weather predictions, as well as other needs for capacity-building, investments and the development of institutions, policies and laws, with a view to overcoming barriers to the development and transfer of technologies.

25. Mr. Francisco Sancho, from the INCAE Business School in Costa Rica, made a presentation on the integration of public transport and metropolitan road decongestion in Costa Rica. He highlighted existing barriers to such action, including: inefficient use of financing structures and limited budgets; lack of private investment and public-private partnerships; and a preference for private transport. He discussed measures to overcome those barriers and accelerate the dissemination and transfer of technology, and noted strategic measures undertaken towards using sustainable technologies and strengthening transport management.

26. Ms. Maka Tsereteli, from the Ministry of Environment Protection in Georgia, provided an overview of a TAP for mitigation through energy efficiency in Georgia. She observed that the focus had been on: efficient construction, as poor-quality constructions result in huge energy losses; efficient wood stoves; and solar water heaters. She discussed common barriers to technology transfer, including: lack of awareness; the absence of a state-wide strategic vision and limited institutional capacity in the areas of energy efficiency and renewable energy; and the unaffordability of the technologies amongst the local public. She also provided an overview of two pilot technology projects: one for efficient construction for sustainable social housing; and the other for efficient wood stoves in rural Georgia.

27. In the discussion following the presentations, participants discussed: the relationship between project ideas and TAPs; how to involve policymakers in the TAP process; and building on existing experiences and lessons learned.

C. Module II: The TNA–TAP process – experience-driven reflections on the state of the art

28. This module included country presentations on the TNA–TAP process, a moderated round-table discussion, a presentation on LEDS and a panel discussion with the participating members of the TEC.

1. The technology needs assessment and technology action plan process: a global perspective

29. Representatives of URC briefed participants on the experiences of URC with the process undertaken to move from the assessment of technology needs to TAPs. They highlighted questions requiring feedback from the participants, including whether the organizational structure of the TNA project was able to ensure that a political process was established at the national level and whether the TNA project was well designed to be supportive of the work of the national project teams. Three presentations were delivered on a regional basis, covering Africa, Asia and the Pacific, and Latin America and the Caribbean.

30. Mr. Birama Diarra (Mali) described the TNA–TAP process undertaken in Mali, including a national workshop to select priority areas in relation to mitigation and adaptation. He cited difficulties, including a lack of documentation available in French and difficulty achieving consensus on the criteria for selecting priority sectors and technologies. He proposed that URC should make efforts to motivate national TNA coordinators and ensure the wide dissemination of the TNA project's results at the international level.

31. Ms. Widiatmini Sih Winanti (Indonesia) made a presentation on how Indonesia's TAP was aligned through the TNA process to support Indonesia's LEDS and national sustainable development priorities. She said that, in Indonesia, two working groups had been established: one on mitigation, relating to the forestry, energy and waste sectors, and another on adaptation, relating to food security, coastal vulnerability and water resources.

32. Ms. Sih Winanti emphasized the importance of ensuring that each member of the working groups is representing their institution and not operating in their own personal capacity, so as to ensure that the outputs are in harmony with national and sectoral goals. On lessons learned, she highlighted the special effort required to: collect the latest baseline data; understand and implement the TNA methodology proposed by UNEP; and arrange stakeholder meetings.

33. Ms. Joanna Zegarra, from the Universidad del Pacífico, in Peru, discussed the institutional organization for the TNA process relating to water and waste management in Peru. On lessons learned, she emphasized the important role of the Ministry of the Environment and the need for the active participation of the Ministry of Finance in technology-related discussions and for the participation of technical experts in the steering committee. She noted the need for a continuous process of "systematization" and a continuous bottom-up approach to capacity-building. On the contribution of the TNA process to sustainable development, she observed that the TNA process has led to discussion on the evaluation and prioritization of technologies.

2. Moderated round-table discussion

34. The moderated round-table discussion was structured around the following issues:

- (a) Practical implications of the TNA–TAP process, including the institutionalization of critical functions at the country level;
- (b) Applied research needs aimed at the further improvement of the process;

(c) Building national capacity for undertaking the process on the basis of existing knowledge and best practice.

35. On practical implications, a representative of URC said that the TNA–TAP process requires additional resources and should involve more stakeholders, and that one steering committee for each of the different projects would help to fine-tune their results. On applied research needs, the continuous improvement of technology options was discussed. On building national capacities, the representative said that there were not enough workshops for sharing experiences at a deeper level.

36. Addressing challenges, a representative of AIT noted that recent data had often not been used in the development of TAPs. He said that publications developed under the TNA project are important and should be accessible in and translated into local languages, and that synthesis reports should be standardized and edited appropriately.

37. On general issues, a representative of Argentina’s Bariloche Foundation highlighted the lack of common terminology, calling for Intergovernmental Panel on Climate Change terminology to be used. On methodological aspects, he observed that TNA and TAP methodologies are often imposed in a top-down fashion on developing countries and do not take national circumstances into account. He called for synergies between the TEC, CTCN and regional centres to be enhanced. In addition, he identified a lack of coherence between barriers to technology transfer and to the implementation of the results of TNAs, and measures to overcome them, and called for a “different dynamic” to national and regional workshops.

38. A representative of Environment and Development Action in the Third World observed that the extent of the work required for TAPs had been underestimated. He said that market assessment is difficult for some countries, owing to the difficulty of obtaining the relevant data. He proposed identifying project ‘champions’ and providing them with opportunities to develop business plans.

39. Furthermore, participants discussed incentives for governments to get involved in the TNA process and the need for TNAs to include financial resources for implementing activities. One participant proposed connecting the TNA process with voluntary actions under the UNFCCC and customizing the next round of TNAs according to national circumstances, such as country size.

3. From technology needs assessments to low-emission development strategies and nationally appropriate mitigation actions

40. A representative of URC made a presentation on ways of linking the development of TNAs with LEDS and NAMAs, highlighting that the prioritization within the TNA process focuses on certain key sectors, including energy, transport, agriculture, industry and others. He noted that, while nationally appropriate technologies have been identified, the potential scale of implementation is not clear. He added that some analysis of TAPs could be used to relate potential mitigation gains to LEDS, NAMAs and global climate goals. He also noted that the TNA methodology can be used for a detailed prioritization of the measures to be implemented.

4. Panel discussion with the participating members of the Technology Executive Committee on the challenges of the technology needs assessment process

41. Mr. Gabriel Blanco, the Chair of the TEC, moderated the session. The panellists addressed three issues:

- (a) Linkages and interactions between the TNA process and the TEC workplan;
- (b) Support provided by the TEC to the work on TNAs and TAPs;

(c) Linkages of the TNA process with other processes under the Convention, such as LEDES, NAMAs and national adaptation plans (NAPs).

42. On linkages and interactions between the TNA process and the TEC workplan, the Vice-Chair of the TEC, Mr. Antonio Pflüger, proposed disseminating messages arising from the TNA process more widely and delivering a coherent message to encourage private-sector investment in developing countries. One member of the TEC highlighted the responsibility of the TEC to respond to information provided and needs identified in TNAs.

43. One participant noted that most of the technologies identified in the TNAs are mitigation technologies, calling for the TEC to make more effort to develop guidelines and methodologies for adaptation technologies. In addition, he highlighted the lack of financing as a big challenge faced when implementing technologies.

44. In response, the Chair of the TEC noted that the TEC has decided that its first technical papers will be developed covering the adaptation technologies and related barriers to their implementation identified in TNAs. He also emphasized the importance of financing to support the implementation of the outcomes of the TNA process, adding that this crucial message would be delivered to the COP.

45. One member of the TEC observed that the challenge is to ensure that TNAs are documents which are given appropriate attention and are recognized by public and private decision makers. He noted the lack of good practices for adaptation planning and the need for support and guidelines for adaptation technologies. He also noted that the TEC is only one part of the equation and that the CTCN will have regional networks and address the issue of the implementation of environmentally sound technologies.

46. Responding to a question on how the TEC will ensure that developing countries are treated equally, the Chair of the TEC noted that the needs of all countries will be addressed by the TEC.

5. The role of the Climate Technology Centre and Network in promoting the development, transfer and deployment of climate technologies

47. Mr. Radka, from UNEP, invited participants to provide advice on the design and role of the CTCN, explaining that it is in the process of being created. He noted that the CTCN has a broad mandate to provide information, advice, training and other kinds of support, including for public-private partnerships and collaborative research and development, and that the decision on its institutional hosting remains to be taken at COP 18. He also invited participants to make recommendations, based on their experience with TNAs, including on: where the national designated entity (NDE) should be located within the national climate change administration; how to ensure that the NDE represents broad technology interests in its country; and what support NDEs would need to fulfil their role within the CTCN.

6. Wrap-up session

48. The Chair of the TEC observed that TNAs are a crucial source of information. He reviewed the suggestions made during the day, including that: countries could integrate and mainstream the TNA process into their sectoral planning; TNAs should include financial resources to implement activities; TNAs could be integrated with other UNFCCC processes, including the preparation of national communications, NAMAs and NAPs; and TNAs should be customized according to national circumstances. He concluded by saying that, while the TNA process has been a useful experience in many ways, it could be improved through some changes and through integration with other processes.

49. Providing an overview of TAPs for mitigation and adaptation, a representative of URC noted that the TAPs presented offered different approaches and scopes of work. She identified common elements of participants' discussions, observing that:

- (a) A single technology does not solve all problems;
- (b) Project ideas need to be developed to become bankable;
- (c) The main challenges are how to catalyse the involvement of private capital and involve relevant communities in TAPs;
- (d) Information on the changing climate is very important, especially for adaptation;
- (e) Flexibility in project management and the delivery of solutions for existing challenges is needed;
- (f) Structural measures, for example in the energy and transport sectors, are very useful.

50. On the TNA–TAP process, it was said that commonalities between countries included: a lack of data when starting the TNA project; the need to introduce changes to some TNA and TAP methodologies; and insufficient usage of the TNA guidelines. The challenges faced in the TNA–TAP process were summarized as follows:

- (a) The amount of work and resources needed were underestimated;
- (b) Tools were not available on time and were only available in English;
- (c) Stakeholders did not always have an incentive to participate;
- (d) Consensus among stakeholders was not easy to reach;
- (e) Guidance differed between that offered in the guidebooks and that offered by the regional centres.

51. The TNA–TAP process was considered by participants to be useful for including the participation of newcomers to the process, including relevant ministries, technology institutions and the private sector. In addition, new tools have been applied in the process, such as multicriteria analysis, and there has been a systematization of the TNA experience. The recommendations arising from the discussions were summarized as follows:

- (a) To develop methods and guidelines for TNAs for adaptation;
- (b) To reinforce the community-based component of TNAs;
- (c) To standardize concepts and clarify the roles of URC and the regional centres;
- (d) To avoid repetition in TNA reports of material from other documents;
- (e) To access the different skills needed for the process by including actors with knowledge of climate change, sectorial knowledge and specific technical expertise, not only 'champions';
- (f) To offer training at the national level and more technical support from the regional centres;
- (g) To promote customized approaches that allow for regional, national and technological differences in TNAs and TAPs;
- (h) To affirm TNAs as part of a bigger process and not as a stand-alone effort.

52. The organizations and actors involved in the TNA–TAP process were considered to still be in a learning process, and it was stated that TNAs and TAPs may offer helpful background material for the development of LEDS and NAMAs. TNAs and TAPs were highlighted as a valuable source of input to the TEC, including information on investment opportunities, and it was stated that the TEC has prioritized adaptation technologies at this stage of its work.

D. Module III: Regional knowledge diffusion on TNA–TAP experiences and outputs by sector

53. Participants convened in three parallel sessions (for Africa and the Mediterranean, Asia and the CIS, and Latin America and the Caribbean) to address TAPs for adaptation in the agriculture, water and food sectors and TAPs for mitigation in the energy, agriculture, forestry and land use, land-use change and forestry sectors. They addressed the following issues:

- (a) Challenges identified in setting targets;
- (b) Specificity of measures;
- (c) Cost and timing of measures;
- (d) The actors involved in the implementation of measures.

1. Adaptation in the agriculture sector

54. Participants emphasized the great importance of adaptation in the agriculture sector and presentations made by Thailand, Viet Nam, Morocco, Lebanon and Costa Rica, respectively, showed a broad range of agricultural practices used.

55. On difficulties experienced in setting adaptation targets, the following issues were discussed: issues of scale as the margin of error increases with the scaling up of interventions from the local to the national level; problems with obtaining data to guide target-setting, owing to multiple locations being included; and the need to allow for countries' varying priorities and existing development aims.

56. On the specificity of adaptation measures, participants mentioned that variation in agro-ecosystems affects the specificity of measures and that much depends on the country and its context, as well as on the availability of accurate data.

57. On the cost and timing of adaptation measures, lack of data was considered a major challenge in terms of the effective costing of measures, and the need for feasibility studies and pilot efforts was highlighted. The group discussions identified some common adaptation activities in the agriculture sector, such as: the training of farmers; the training of technicians; increasing research and development efforts; organizing awareness and marketing campaigns; and updating institutional arrangements, noting that they influence the cost of measures.

58. On the actors involved in the implementation of adaptation measures in the agriculture sector, participants identified public institutions responsible for agriculture and finance, private-sector actors, including farmers and others in the agriculture value-chain, civil-society organizations, and development partners, such as donor agencies.

2. Adaptation in the water sector

59. In the group discussions on the process of developing TAPs for adaptation in the water sector, recalling the presentations made by Morocco, Mali, Indonesia, Viet Nam and

Peru, respectively, the groups had similar goals of increasing water availability, improving water management and improving analytical tools, with activities spanning rainwater harvesting, terrace management, building reservoirs, wastewater and desalination treatment, groundwater recharge and small-scale dams, as well as improving irrigation systems and establishing flood warning, through water resources modelling.

60. On difficulties in setting adaptation targets, participants dealt with the absence of national water strategies or programmes, the challenge of quantifying the “vulnerability reduction potential” of technologies and other measures, the lack of coordination among water resources institutions and the high price of modelling software.

61. Regarding the specificity of adaptation measures, participants considered specificity only in terms of measures based on pilots or small-scale projects. Many of the proposed measures were general ones, such as capacity-building and the establishment of financial mechanisms, some of which were proposed to complement larger national strategies. Priority-setting was highlighted as a challenge.

62. On the cost and timing of adaptation measures, the costs varied depending on the scale of the adaptation project and its geographical location, while cost estimates were made on the basis of expert judgment in the case of data unavailability.

63. On stakeholder involvement, participants discussed that it was sometimes unclear at which stage government decision makers and NGOs should be involved in the TAP process, and that questions remain about what the role of stakeholders in implementing TAPs should be, how to organize monitoring and follow-up and how to integrate TAPs into other established programmes.

3. Mitigation in the energy sector

64. Common themes highlighted during the group discussions on TAPs for mitigation in the energy sector included: the ambition of the technology in relation to the available budget; that the project methodology should take into account existing barriers; and the role of political support.

65. On difficulties in setting mitigation targets, participants discussed relating targets to countries’ existing national programmes or to the main problems confronting the sector. They highlighted the lack of cooperation and investment, the problems with multicriteria analysis in the absence of consensus among stakeholders and the impact of tariffs on renewable energies.

66. On the specificity of mitigation measures, participants noted that measures to create an enabling environment are considered necessary but not enough to obtain the expected results.

67. On the cost and timing of mitigation measures, participants noted that it is difficult to estimate the cost of technologies, noting that the available budget is limited. On actors, they said that the issue is the timing of their involvement (when to carry out the action and why), adding that identified actors in the TAP process include ministries of finance and energy, industry, local communities and civil society.

68. A representative of URC summarized the common themes of the discussions, noting that: the project targets have been difficult to achieve; countries lack data; and countries have attempted to link targets with their current national plans. He said that TAPs do not include their own targets. On measures, he noted that the lack of data for estimating costs is a major problem, given the wide variation in existing data within and across countries. He noted the general agreement on the involvement of stakeholders, with issues being associated with the timing of their involvement.

E. Module IV: From plans to actions – developing project proposals capable of attracting funding

69. A representative of URC presented two guidebooks, on financing mitigation and adaptation, respectively, which he said are intended to provide guidance on the diversity of funding sources available and on writing project ideas and proposals in such a way as to attract potential financiers.

70. He highlighted that there is also diversity in terms of financing instruments and the importance of understanding which agencies are likely matches for project proposals, adding that most funding has gone into mitigation efforts rather than adaptation and that further guidance is available in UNFCCC guidebooks and other documents.

71. A representative from AIT made a presentation entitled “Project Ideas: Tips and Pitfalls”, introducing several templates for the presentation of project ideas, evaluating project ideas and highlighting potential pitfalls. He outlined that a proposal should provide information on: the background and context of the project; the objectives of the project and the anticipated effects, with quantitative information as far as possible; the relationship of the project to the country’s sustainable development priorities and activities; the main benefits of the project and its beneficiaries; new partnerships that will be generated; feasibility; sustainability; replicability; budget and other resource requirements; the main activities; monitoring and evaluation; risk factors; and the responsibilities of key stakeholders and agencies.

72. He presented examples of templates for submitting project information from the clean development mechanism, the GEF, the European Union, the United States Agency for International Development, and the Energy and Environment Partnership, as well as some tools for the preparation of proposals, including the logical framework approach. He identified potential pitfalls, including: the failure to identify the root causes of a problem and to link proposed activities to them; unrealistic funding requirements; and the failure to quantify a project’s benefits, among many other issues.

73. Discussion among participants focused on the targeting of project proposals to specific donors, the depth of the economic information required, co-financing requirements and accessing funding to cover the transaction costs of developing project proposals.

F. Module V: Training session on preparing and presenting project proposals for financing

74. A representative of the secretariat introduced the module, noting the complexity of preparing project proposals. He said that the session would focus on accessing funding sources by preparing bankable project proposals.

1. Group exercises

75. Introducing the session, Mr. Peter Storey, from the CTI Private Financing Advisory Network, highlighted typical problems with projects proposals, including being untargeted, incomplete or unbalanced and typically “long on technology and short on financials” and including poor risk analysis.

76. Participants then took part in group exercises, applying a seven-question building-block approach to preparing project proposals:

- (a) What: in terms of product, service, technology and client;
- (b) Where: relating to location, market, and operating and regulatory conditions;

(c) Who: in relation to the actors, the project champion or owner and the enablers or sponsors, as well as the approval bodies and stakeholders;

(d) Why: the rationale for the project (financial, social, environmental, market growth) and whether the benefits can be quantified;

(e) How: regarding an operational plan for the project's implementation, taking into consideration budget for capital and operating costs as well as milestones and schedules;

(f) What if: contingency planning – a proposal needs to show an awareness of the key events that can alter cost, timing, service delivery and outcome;

(g) To whom: conforming to the needs and processes of the enabling organization from which resources are needed.

2. Round-table discussion

77. The Vice-Chair of the TEC moderated the round-table discussion and introduced the four panellists. Opening the discussion, he identified public and market-driven sectors of relevance to climate-related technological investments. He emphasized the need for investment security and that governments and regulators need to offer attractive “framework conditions” to encourage investments. He said that the role of governments could include: providing legislation and regulation; removing barriers that do not make sense in relation to particular technologies; enforcing legislation; building infrastructure; and providing stable conditions for investment security; while the private sector could work with governments on education, training, job creation and research and development.

78. He then invited the panellists to put forward their opinions on the following questions:

(a) From project concepts to investment: where do the discussants see their role and when and how would they want to be involved?

(b) What are the roles of the public and private sectors?

(c) How could policy messages reach policymakers and what role could the COP play here?

79. Mr. Patrick Nussbaumer, from UNIDO, presented efforts made to deliver project ideas to donors and the technical cooperation of UNIDO on capacity-building and institutional development. He called on participants to consider different models of financing beyond a “project-by-project” approach, noting that donors as well as project developers incur transaction costs. He recommended giving high priority to policy coordination between ministries.

80. Mr. Storey highlighted the need to work “at scale”, highlighting his organization’s consideration of ways to cluster projects in order to achieve scale. He distinguished between the development of new technologies, which employs venture capital, and the commercialization stage, which requires scale and the possibility for replication. He called for governments to provide a clear and stable policy environment in relation to issues such as energy mix targets and feed-in tariffs and to ensure appropriate legislation and enforcement.

81. Mr. Allan Dale Gonzalez, from Full Advantage, highlighted the need for cash flow analysis and investment analysis as part of risk assessment, in order to address concerns about whether investors can make a profit from technologies. He recommended that governments build up the confidence of investors, noting that private-sector confidence in relation to carbon markets has diminished. He further recommended efforts to stabilize the

pricing of carbon credits and related policies and to ensure the continuity of climate change initiatives and policies, for example on the future of the Kyoto Protocol and on countries' eligibility to access carbon markets.

82. Mr. Mozharul Alam, from UNEP, made a presentation on supporting countries in the design and implementation of their mitigation and adaptation projects. He noted that UNEP is promoting scale by working with the Asian Development Bank and other financial institutions to provide soft loans and partial guarantees. He recommended promoting the cost-effectiveness of climate-related investments and avoiding trade-offs between short-term and long-term objectives.

83. Participants highlighted the need to push for the CTCN to become operational and to encourage the CTCN to assist with the implementation of the results of TNAs. Participants called on governments to be clear on the role and benefits of the private sector and for the private sector to consider not only financial returns in their analysis of projects, but also the social and environmental benefits.

IV. Issues for further consideration

84. During the workshop, participants raised several issues for further consideration, including identifying good practices and lessons learned from the TNA–TAP process, challenges in the TNA–TAP process and ways and means to overcome them, and possible recommendations for the future of the TNA–TAP process.

A. Good practices and lessons learned from the technology needs assessment and technology action plan process

85. Regarding conducting TNAs, preparing TAPs and reporting thereon, participants highlighted the following good practices and lessons learned:

(a) The TNA methodology needs to be adjusted to countries' national circumstances. Collecting the latest baseline data, understanding and implementing the proposed methodology and arranging stakeholder meetings were considered key challenges when conducting TNAs. The publications prepared to support the TNA project were considered important and were requested to be accessible in and translated into local languages;

(b) Regular updates on the TNA project delivered to political and technical actors are needed to buttress political support. The incentive for governments to get involved in the TNA process and the need for TNAs to include financial resources for implementing activities were considered key preconditions for the success of the TNA project. Countries' endogenous capacities should be taken into account when prioritizing identified technologies;

(c) Employing the same stakeholders in the TNA–TAP process as in other processes, including the preparation of national communications, was considered an effective way of benefiting from existing work and vice versa to provide useful inputs to the work under other processes;

(d) Within the TNA–TAP process, the knowledge exchange at the national and international levels should be increased and the creation of facilitative and matchmaking networks was considered to be utilized as an effective means of linking countries with similar technology, finance and capacity-building needs;

(e) The need for a continuous process of “systematization” and a continuous bottom-up approach to capacity-building was considered important for the sustainability of the TNA project;

(f) A broad range of adaptation technologies have been identified under the TNA–TAP process, which could serve as valuable input to other relevant adaptation activities undertaken by other bodies under the Convention.

86. In terms of implementing the results of TNAs, the discussion focused on how to engage the financial and business community in implementing the results of TNAs and how to convert project ideas into bankable project proposals. Participants noted that:

(a) High-level political support is crucial for the effective implementation of the results of TNAs and sustained momentum against a backdrop of often competing initiatives in a given country;

(b) Governmental engagement in the TNA process is fundamental to deliver predictable policies and to create appropriate regulatory frameworks to enable environments for investments, as well as to participate in innovative funding instruments, such as public–private partnerships. Supported technologies should be in line with national priorities;

(c) Stakeholder engagement and commitment to the TNA process was considered to be high where there is a strong signal from donors regarding the availability of financing for TAPs, NAPAs and NAMAs or specific prioritized technologies. Early dialogue with funders is essential to ensure compatibility with their guidelines and funding criteria, as this is a basic criterion for project implementation;

(d) The risk of the investment should be taken into account when presenting projects to investors, in order to improve access to finance;

(e) Sharing information on the implementation of the results of the TNA–TAP process with the financial community and the private sector was considered essential.

B. Challenges in the technology needs assessment and technology action plan process and ways and means to overcome them

87. Regarding the TNA–TAP process, participants highlighted the following challenges and ways and means to overcome them:

(a) The extent of the work required for conducting TNAs, preparing TAPs and reporting thereon is in some cases overburdening the capacity of the regional centres and in some cases the extent of the work required was underestimated. Some participants asked to expand their country project teams; however, in some cases it has already been found to be challenging to achieve consensus on the criteria for selecting priority sectors and technologies within the existing teams;

(b) The TNA and TAP methodologies were in some cases found to be challenging to apply. The guidelines were considered to be designed in such a way as to be more accessible to the international community than to national and local stakeholders. It was noted that, in order to reflect national circumstances, the methodologies need to be more flexible;

(c) On building national capacities to conduct TNAs, prepare TAPs and report thereon, there were not enough workshops for sharing experiences at a deeper level and there was a lack of documentation available in languages other than English (French, Spanish, etc.);

(d) A significant effort was proposed to be given to ensuring the wide dissemination of the results of TNAs and TAPs at both the national and the international level. The development of a platform on which to share information on technologies and implemented mitigation and adaptation projects was proposed in order to resolve the issue of lack of access to information.

88. On implementing the results of TNAs and TAPs, participants discussed the following challenges and ways and means to overcome them:

(a) Participants urged the bridging of the continuous implementation gap. Some barriers to the implementation of the results of TNAs were identified, including lack of public awareness, the absence of a state-wide strategic vision and limited institutional capacity, the inefficient use of financing structures and limited budgets, and the lack of private investment and other funding tools, such as public-private partnerships;

(b) Governments were called on to provide a clear and stable policy environment with regard to important issues such as energy mix targets and feed-in tariffs and to ensure appropriate legislation and enforcement, and it was recommended that they build up the confidence of investors, noting that private-sector confidence in relation to carbon markets has diminished. The private sector was asked to consider also the social and environmental benefits of projects alongside the financial returns when making investment decisions;

(c) There is a need to enhance the capacity of project developers in developing countries to prepare project proposals for financing, by organizing regional workshops on financing technology transfer projects and TNA training sessions, including seminars and webinars, to provide well-tailored advice to project developers to assist them in meeting the requirements of the investment community;

(d) It was recommended for project proponents to distinguish between the development of new technologies, which employs venture capital, and the commercialization stage, which requires scale and the possibility for replication;

(e) Creating an efficient mechanism for delivering targeted information about funding opportunities linked to prioritized technologies was considered helpful.

C. Possible recommendations on the future of the technology needs assessment and technology action plan process

89. In relation to the future of the TNA process, the following recommendations were made by participants:

(a) The continuation of efforts to explore and operationalize synergies between the TNA-TAP process and other existing efforts, such as the preparation of national communications, LEDS, NAMAs and NAPs, while also reaching out to new initiatives, such as the CTCN, was considered essential for the sustainability of the TNA process;

(b) Capitalizing on the experiences gained and lessons learned from the TNA process for the preparation and implementation of NAMAs, NAPs, LEDS and technology road maps or action plans was considered of key importance. These processes were recommended to be developed as circular, feeding into one another and avoiding duplication of effort and overburdening the capacity of countries to report on their development;

(c) In terms of interlinkages with other mechanisms, tools and processes, TNAs were considered to be an appropriate input to the TM and a fundamental element of the work of the TEC and the CTCN. TNAs were also considered to be a rich source of

information for the TM on needs, barriers and good practices, enabling the TEC and other relevant bodies to translate this information into broader policy guidance.

90. In terms of implementing the results of TNAs, the following recommendations were made:

(a) Alternative models of financing were proposed for consideration in a future beyond a “project-by-project” approach, noting that donors as well as project developers incur transaction costs;

(b) The need to work “at scale” and hence to cluster proposed projects in order to achieve an investment scale to attract financing from the private sector and other institutions was highlighted. Mechanisms for scaling up projects were also found to be promoted by some United Nations implementing agencies when working with development banks and other private-sector and financial institutions to provide soft loans and partial guarantees;

(c) Further efforts were recommended to stabilize the pricing of carbon credits and related policies and to ensure the continuity of climate change initiatives and policies, for example on countries’ eligibility to access carbon markets;

(d) Participants highlighted the need for the CTCN to become operational and encouraged the CTCN to assist with the implementation of the results of TNAs.
