United Nations FCCC/SBSTA/2011/INF.10

Framework Convention on Climate Change

Distr.: General
18 October 2011

English only

Subsidiary Body for Scientific and Technological Advice
Thirty-fifth session
Durban, 28 November to 3 December 2011

Item 5 of the provisional agenda
Development and transfer of technologies

Report on the workshop on technology needs assessments

Note by the secretariat

Summary

A workshop on technology needs assessments (TNAs) was organized by the secretariat, in collaboration with the Global Environment Facility, the United Nations Development Programme, the United Nations Environment Programme and the Climate Technology Initiative, and held from 1 to 2 June 2011 in Bonn, Germany. The workshop provided an opportunity for participants to share good practices in and lessons learned from conducting TNAs with Parties not included in Annex I to the Convention, and to identify specific needs and practical actions that could assist Parties in implementing the results of their TNAs. It also provided an opportunity to exchange views with representatives of the private sector and the financial community on possible ways to enhance access to funding for the implementation of the results of TNAs, and to discuss possible roles of TNAs in the context of the implementation of the Technology Mechanism, established at the sixteenth session of the Conference of the Parties.

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I. Introduction

A. Mandate

1. The Conference of the Parties (COP), at its sixteenth session, noted the proposal by the President[1] to request the secretariat to complete the remaining activities contained in the work programme of the Expert Group on Technology Transfer (EGTT) for 2010–2011.[2] The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its thirty-third session, noted[3] that the secretariat was to organize, in early 2011, a workshop on good practices in conducting technology needs assessments (TNAs), as specified in the updated programme of work of the EGTT for 2010–2011. The SBSTA, at its thirty-fourth session, noted that the written report on the outcomes of that workshop would be made available for consideration by the SBSTA at its thirty-fifth session.[4]

B. Scope of the note

2. This note, prepared by the secretariat, contains a summary of the 17 workshop presentations and the panel and general discussions that took place during the workshop referred to in paragraph 1 above. Ideas for possible further activities in relation to TNAs that were suggested by participants during the workshop can serve as input to the relevant further discussions and considerations of the SBSTA at its thirty-fifth session.

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 further implementation of the framework for meaningful and effective actions to enhance the implementation of Article 4, paragraph 5, of the Convention adopted by decision 4/CP.7 and enhanced by decision 3/CP.13, as decided by decision 1/CP.16, paragraph 119, and in the enhancement of technology development and transfer activities under the Convention to support action on mitigation and adaptation.

D. Background

4. In accordance with the framework for meaningful and effective actions to enhance the implementation of the technology transfer framework, 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 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

[1] FCCC/CP/2010/7, paragraph 76.
[2] FCCC/SB/2010/INF.1, annex I.
[3] FCCC/SBSTA/2010/13, paragraph 32.
[4] FCCC/SBSTA/2011/2, paragraph 38.

stakeholders at the national level to identify technology needs and to develop plans of action for meeting those needs.

6. Since COP 7, developing country Parties have been assessing their technology needs in the areas of climate change mitigation and adaptation by means of an analysis that takes account of their 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 the United Nations Environment Programme (UNEP). Some 68 TNA reports have been submitted to the secretariat and are available on the UNFCCC technology information clearing house, TT:CLEAR.[5]

7. To help Parties in conducting their TNAs, UNDP, in collaboration with the secretariat, the EGTT and the Climate Technology Initiative (CTI), developed the updated handbook *Conducting Technology Needs Assessments for Climate Change* (hereinafter referred to as the updated TNA handbook),[6] which was published in November 2010. It provides specific guidance on identifying technology needs for mitigation of and adaptation to climate change, including the two innovative supporting tools TNAssess[7] and ClimateTechWiki.[8]

8. In response to the request made by the COP in its decision 4/CP.13, 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, welcomed[9] the GEF Strategic Program on Technology Transfer (renaming it the Poznan Strategic Program on Technology Transfer (PSPTT)) 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: (a) conducting TNAs; (b) piloting priority technology projects linked to TNAs; and (c) disseminating GEF experience and successfully demonstrated ESTs.

9. The UNEP TNA project under the PSPTT aims to provide targeted financial and technical support to assist up to 45 developing countries in developing and/or updating their TNAs and to support them in preparing technology action plans (TAPs). The project seeks to use methodologies from the updated TNA handbook. A total of 15 countries were selected to take part in the first round of the project in early 2010 and 21 countries were added in late 2010 as the second-round countries.

II. Proceedings

10. The workshop on TNAs was held in Bonn, Germany, from 1 to 2 June 2011. It was organized jointly by the secretariat, the GEF, UNDP, UNEP and CTI, under the guidance of

[5] <http://unfccc.int/ttclear/jsp/CountryReports.jsp>.

[6] UNDP. 2009. *Handbook for Conducting Technology Needs Assessments for Climate Change*. Available at <http://unfccc.int/ttclear/pdf/TNA%20HANDBOOK%20EN%2020101115.pdf>.

[7] Software tool to support the process of taking decisions on prioritized technologies for mitigation and adaptation in a country. Available at <http://portal.climatetechwiki.org/index_tnassess.html>.

[8] Online database which provides basic information on ESTs, including specific project examples. Available at <http://climatetechwiki.org>.

[9] Decision 2/CP.14, paragraph 1.

the Chair of the SBSTA. Financial support for the organization of the workshop was provided by the Governments of the Netherlands and Spain, CTI and UNEP.

11. The objectives of the workshop were:

(a) To share good practices in and lessons learned from conducting TNAs with non-Annex I Parties;

(b) To identify specific needs and practical actions that could assist Parties in implementing the results of their TNAs;

(c) To discuss possible roles of TNAs in the context of the implementation of the Technology Mechanism.

12. The agenda of the workshop, prepared in consultation with the Chair of the SBSTA and representatives of UNDP, UNEP, the GEF and CTI, included five sessions: setting the scene; lessons learned and good practices in conducting TNAs; implementing the results of TNAs; strategies and recommendations for the future of the TNA process; and the way forward. The third and fourth sessions included panel discussions on experiences in and lessons learned from supporting technology transfer activities and on the possible role of TNAs in enhanced action on technology development and transfer to support action on mitigation and adaptation.

13. The TNA workshop was attended by 69 participants: 39 from non-Annex I Parties, 13 from Parties included in Annex I to the Convention, 11 representatives of intergovernmental and non-governmental organizations, four from United Nations organizations and two representatives of specialized agencies and related organizations.

III. Summary of discussions

A. Setting the scene

1. Background and workshop expectations

14. The workshop was opened by the Chair of the SBSTA, Mr. Mama Konaté. He said that developing technologies and transferring them to developing countries is paramount to the countries' capacity to act on the mitigation of and adaptation to climate change. Mr. Konaté welcomed the workshop as an opportunity to share experiences gained and lessons learned from the TNA process, and stressed that TNAs are essential in bringing together the relevant stakeholders to identify technology needs and to develop plans of action to meet those needs. Mr. Konaté considered the workshop to be a milestone in the TNA process and an important 'prelude' to the Technology Mechanism.

15. A representative of the secretariat recalled the progress made over the past decade in the work on TNAs and emphasized that the workshop would provide a platform for bringing ideas and guidance to the upcoming negotiations on the implementation of the Technology Mechanism.

16. The chair of the workshop, Mr. Kishan Kumarsingh, in his introductory remarks noted that TNAs present a unique opportunity for countries to track their needs for new equipment, techniques and services and the capacities necessary to mitigate greenhouse gas (GHG) emissions and reduce the vulnerability of sectors and livelihoods to climate change. He further noted that the workshop had come at a good moment in time, as some countries are in the process of finalizing their TNA reports and the workshop would provide an opportunity for them to share their experiences and lessons learned with the other countries that are in the process of conducting or updating their TNAs.

17. Mr. Kumarsingh concluded by saying that the Technology Mechanism is expected to provide advice and support related to the identification of technology needs and the implementation of ESTs, practices and processes, and that the outcomes of the workshop might provide useful inputs into that process. Mr. Kumarsingh then invited Parties to convey their expectations for the workshop.

18. The participants from Argentina, Armenia, Botswana, Japan and the United Kingdom of Great Britain and Northern Ireland commented on their expectations for the workshop, which included sharing good practices and lessons learned in conducting TNAs, sharing success stories and challenges and gaps faced when preparing the TNA reports, discussing the possible engagement of the private sector in implementing the results of TNAs, and discussing linkages between TNAs and national development strategies and other relevant international processes.

19. One participant from a developing country drew attention to the need to engage in discussions on TAPs and to discuss possible interlinkages between TNAs and other processes, such as nationally appropriate mitigation actions (NAMAs), national adaptation programmes of action (NAPAs), low-carbon development strategies (LCDS) and technology road maps or action plans.

20. A participant from a country with an economy in transition (EIT country) highlighted that it would be useful to discuss the most effective and efficient methods of conducting and updating TNA reports in the light of new emerging technologies. Further, she expressed interest in a database of successful ESTs and other tools to assist in the TNA process.

21. A developing country participant was interested in sharing experiences with other countries of responses received from the private sector in relation to the TNA process, the implementation of the results of TNAs, and related technology diffusion in the national context.

22. A participant from a developed country said that TNAs provide important input to the Technology Mechanism for identifying technology needs and barriers to implementing those needs. He noted that, at the workshop on "Innovative Options for Financing the Development and Transfer of Technologies", held in Montreal, Canada, in 2004,[10] representatives of financial institutions had already highlighted the availability of financial resources but a lack of financeable project proposals.

23. Another participant from a developed country highlighted the need for in-depth discussions on success stories and gaps and challenges that developing countries have faced in conducting their TNAs. In addition, he invited participants to discuss how developing Parties should link their TNAs with their national development strategies and priorities, the efforts of Parties conducting TNAs to coordinate with neighbouring countries in similar environments, and the emphasis on balancing the identification of mitigation and adaptation needs.

24. A representative of the secretariat delivered a presentation on TNAs under the UNFCCC process. He summarized the findings contained in the second synthesis report on technology needs,[11] including the most commonly identified mitigation and adaptation sectors and technologies and barriers to technology transfer. He then introduced two workshop background papers, one on good practices and lessons learned in conducting and reporting TNAs and one on enhancing the implementation of the results of TNAs. He highlighted that sound TNA reports usually involved a knowledgeable project leader and a team of experts previously involved in similar tasks, and included links between identified

[10] <http://unfccc.int/ttclear/jsp/EventDetail.jsp?EN=WshpMontreal>.
[11] FCCC/SBSTA/2009/INF.1.

technologies and the priorities of the national development strategy. He also highlighted that, while more than 250 project ideas have been reported by Parties, only some 17 are reported to have been implemented, which gives an indication of the existing implementation gap.

25. Representatives of UNEP and the UNEP Risoe Centre on Energy, Climate and Sustainable Development presented information on TNAs under the PSPTT. They noted that the outcomes that they expect from the new round of TNAs include: national consensus on priority technologies and agreement on TAPs; methodologies which complement the updated TNA handbook; the developed capacity of project teams; increased access to technology information; the operation of regional networks; and increased national and interregional cooperation to facilitate the conduct of TNAs and the implementation of TAPs.

B. Lessons learned and good practices in conducting technology needs assessments

26. Workshop participants delivered presentations on their experiences in conducting and supporting TNAs. The presentations were made in two subsequent subsessions on national and international perspectives.

1. National perspectives

27. A participant from Cambodia introduced the country's organizational structure for conducting its TNA. He presented inter-ministerial working groups and an implementation support team. He highlighted that the multi-criteria decision analysis (MCDA) tool is a useful tool to assist countries in the prioritization of technologies. He concluded by saying that Cambodia's TNA will contribute to the development of the national strategy and action plan on climate change, NAMAs and other planning practices.

28. A representative of Costa Rica introduced the low-carbon strategy of his country, aimed at achieving carbon neutrality by 2021. He noted the need to focus on the sectors that are primarily responsible for the emission of GHGs. He elaborated on the organization of stakeholder networks, the methodology, the criteria for selection and prioritization of sectors and technologies, and barriers to implementation. With regard to lessons learned, he stressed that the TNA methodology needs to incorporate country specifics, and that knowledge exchange at the national and international levels should be increased.

29. The MCDA tool was highlighted by a participant from Mali as an effective tool for the selection of technologies to serve as input to the development of national action plans (NAPs). The following criteria have been used to select and prioritize technologies: the maturity of the associated technology; GHG emission reduction potential; vulnerability to climate change; cost; and the contribution to the socio-economic development of the country. He concluded by recommending appropriate actions to facilitate the implementation of NAPs.

30. A participant from Peru underscored that Peru is heavily affected by climate change as it has multiple adaptation needs, responding to vulnerabilities all around the country, owing to many variables, such as topography, biodiversity and ecosystems; Peru's economy is hyper vulnerable to its use of natural resources; and most of the population live in the coastal zones. With regard to the lessons learned by Peru from conducting its TNA, she highlighted the importance of sound project coordination and having a multidisciplinary team for the identification of political, technical, environmental and social goals. As a good practice she recommended the development of a detailed workplan and conducting the TNA on the basis of already existing data and experience.

31. Several lessons learned from the ongoing development of the country's TNA were delivered by the participant from Senegal, including: the importance of the creation of an expert team on a multisectoral basis, and carefully defined criteria and their weights for the selection and prioritization of technologies; the need for reflection on how to engage policymakers in the implementation of the results of TNAs; the need to organize regional workshops on preparing technology transfer projects for financing; and the need to see how to capitalize on existing gains and experience for the preparation and implementation of NAMAs and NAPs.

32. A Chinese participant detailed China's experiences gained and lessons learned from conducting its TNA. Since the TNA process has not yet been completed in China, he made a presentation on relevant studies serving as input to the TNA. He underscored some key findings of the existing studies, including the lack of a comprehensive overview of major sectors taking into account regional differences. He said that the main criteria for the selection of technologies should be their GHG emission reduction potential and cost. He noted that, so far, insufficient attention has been paid to adaptation technologies. He also noted that most of the existing studies are elaborated from the perspective of technology receivers and that there is an absence of technology reviews conducted in supplier countries.

2. International perspectives

33. A representative of UNDP elaborated on the updated TNA handbook, including its supporting software tools ClimateTechWiki and TNAssess, an Excel-based MCDA support tool. She noted that these tools build upon one another and that they were developed to support countries involved in the global TNA project under the PSPTT in conducting their TNAs.

34. A review of the experiences of CTI in supporting Parties in conducting their TNAs was provided by the representative of CTI. He noted that CTI contributed to the evolution of TNAs by developing a methodology for TNAs in 2000. He said that CTI is adding value to the TNA process by facilitating interactions between governments, agencies, businesses and relevant international and other organizations. Further, he said that CTI has provided technical assistance to more than 10 countries in conducting their TNAs. In terms of lessons learned, he highlighted that TNAs should be living documents, the importance of creating and accessing informal networks in specific technical areas, and the importance of an engaged and dynamic leader.

35. A representative of the German Society for International Cooperation provided an overview of renewable energy, energy efficiency and capacity-building needs commonly identified in TNAs, building on its experiences in supporting developed countries. He focused on the transport sector and highlighted that cleaner technologies in public transportation are also often addressed by developing countries. He recommended keeping TNA reports short and focused on country-specific information, avoiding general descriptions of technologies, including also non-technological options on the information platforms TNAssess and ClimateTechWiki, such as demand-side management, and responding to the increasing demand for technical support for TNA analysis.

C. Implementing the results of technology needs assessments

36. Workshop participants delivered in this session presentations on their experiences in implementing the results of TNAs. The presentations were followed by a panel discussion involving representatives of international organizations and private-sector bodies.

1. International and private-sector perspectives

37. On behalf of the GEF, a representative of UNEP gave an update on the PSPTT and on the role of the GEF in funding technology transfer. He said that the PSPTT has a funding level of some USD 35 million from the fourth replenishment of the GEF and USD 15 million from the Special Climate Change Fund. He noted that the GEF has already supported technology transfer pilot projects in 16 countries in cooperation with six implementing agencies. The total funding provided for these pilot projects was USD 58 million, plus co-financing of USD 195 million. He concluded by providing an overview of the long-term programme on technology transfer, which includes a funding window to target low- and medium-income countries for the conduct and update of their TNAs.

38. A representative of the secretariat delivered a presentation on preparing technology transfer projects for financing. He shared some funding opportunities for financing the implementation of the results of TNAs, including multilateral and bilateral funding, private-sector funds and national sources of funding. He highlighted some of the typical issues with project proposals, such as proposals being incomplete or imbalanced, non-responsive to the requirements of the donor or just difficult to understand. He stressed that there is no single formula for successful proposals; however, addressing financial structure should be done early in the preparation process and the proponent should keep in mind that the project preparation costs can add up to about 5 per cent of the total budget.

39. A participant from the CTI Private Financing Advisory Network (PFAN) introduced its endeavours in attracting private funds for climate technologies. He said that the network is keen to provide free support and advice to project developers to assist them in meeting the requirements of the investment community. He noted that pointing out attractive projects for private-sector investment by international institutions in TNAs would create win-win situations.

40. The Global Energy Efficiency and Renewable Energy Fund (GEEREF), as presented by a representative of GEEREF, is a public–private partnership that acts as a fund for renewable energy and energy efficiency funds. The representative explained that the funds of GEEREF are currently leveraged by a factor of 35 for every USD 1 of public money invested. He explained that the goal of GEEREF is to fund projects too small or too remote for private equity, focusing on developing countries in Africa, Asia and Latin America. He noted that many countries seeking technology transfer and related investments lack the necessary regulatory frameworks.

41. The session was followed by a discussion. One participant from a developed country was seeking linkages between technology transfer pilot projects and TNAs. A participant from an EIT country underscored the need to review and revise TNAs and to broaden the range of countries conducting TNAs in order to deliver more good practices and experience at the regional level. The representative of GEEREF noted the challenge of making investments in technology transfer compatible with the requirements of the private sector.

2. Panel discussion

42. The session on implementing the results of TNAs from the international and private-sector perspectives continued with a panel discussion involving representatives of international organizations and the private sector on experiences gained and lessons learned from supporting technology transfer activities. The discussion was facilitated by Mr. Kunihiko Shimada and was structured around four guiding questions:

(a) What are the specific lessons that can be learned from international organizations and the private sector supporting the implementation of technology transfer activities in developing countries, including policies and measures, programmes and projects?

(b) What important factors do international organizations and the private sector take into account when making decisions about financing or investing in technology transfer activities in developing countries?

(c) What steps are critical for ensuring that the technology transfer activities that result from a TNA can be implemented? How could the TNA process be enhanced to achieve greater implementation of such technology transfer activities?

(d) What would be the most efficient way for governments to collect information and assess the adequacy of financial resources for implementing the results of TNAs?

43. In terms of specific lessons learned by international organizations and the private sector, the representative of the Asian Development Bank (ADB) said that the deployment of commercially viable technologies is relatively straightforward; however, even profitable projects may not come to completion if policy frameworks and regulations that minimize non-commercial risks are lacking. He noted that, to be considered by potential funders, the proposal should be aligned with national development priorities and strong ownership by local public or private partners must be demonstrated. The representative of the KfW Bankengruppe (KfW) said that development banks do not focus on technology dissemination, but focus instead on national development goals, which should be taken into account when conducting TNAs. The representative of the World Business Council for Sustainable Development (WBCSD) noted that companies follow the demands of customers, but cannot serve customers when an adequate and transparent regulatory and policy framework is lacking.

44. With regard to important factors taken into account by international organizations and the private sector when making decisions about financing, the participant from WBCSD said that, to engage the private sector effectively, TNAs need to identify barriers to technology transfer that need to be overcome. She also said that the presence of skilled labour is key for the private sector and therefore capacity-building is very important. The representative of KfW noted that the active participation of donors in the project identification phase would be an asset.

45. In terms of critical steps for ensuring that the technology transfer activities that result from a TNA can be implemented, a representative of the Renewable Energy and Energy Efficiency Partnership (REEEP) warned that skewed pricing is a barrier to investment. A participant from WBCSD added that the private sector rarely invests in isolated markets and that in such cases regional coordination is essential. A representative of ADB said that the available private funds will likely not flow to high-risk areas without greater policy support through government engagement and international assistance.

46. With regard to efficient ways for governments to collect information and assess the adequacy of funding resources for implementing the results of TNAs, a representative of KfW noted the importance of early dialogue with funders in order to ensure compatibility with their guidelines and funding criteria. A representative of REEEP stressed that the private sector must participate in the TNA process from the beginning, optimally being a part of the country team.

47. During the discussion that followed, a participant from a developed country highlighted that enabling environments are key and that one of the main criteria investors apply when making decisions on entering markets is the predictability of governmental policies. He noted that technology implementation should be one of the key functions of TNAs. A participant from a developing country emphasized the importance of establishing markets for the implementation of adaptation technologies. He also said that TNAs must be balanced between mitigation and adaptation needs. Another developing country participant said that technology transfer should create local jobs. A representative of WBCSD said that, to move into early implementation, public–private partnerships are essential. A

representative of REEEP highlighted the benefits of engaging relevant stakeholders, including the private sector, and stressed that, to move ahead, national regulators should focus on establishing appropriate frameworks. A representative of KfW said that the answer is not just to create an environment for the market to maximize profits, but that barriers must be addressed and that reducing risk via the creation of benign environments to uptake market creativity is fundamental. The representative of ADB said that there are currently pilot attempts to encourage joint ventures that can take existing core technologies in developed countries and turn them into customized technology products that fit local needs while creating employment.

D. Strategies and recommendations for the future of the technology needs assessment process

48. Workshop participants delivered in this session two presentations. The presentations were followed by a panel discussion involving representatives of four Parties and two international organizations.

1. Background

49. A representative of the secretariat delivered a presentation on the Cancun Agreements, the Technology Mechanism and TNAs. He reviewed key elements of the outcome of the Cancun Agreements and the institutional architecture under decision 1/CP.16. He noted that the Technology Mechanism, including its two components the Technology Executive Committee (TEC) and the Climate Technology Centre and Network (CTCN), builds upon existing initiatives and the technology transfer framework, and explained that the TEC mandate and composition have been agreed upon, but the modalities and procedures for making its functions operational have not. He also noted that less has been agreed in relation to the CTCN.

50. A representative of the Joint Implementation Network made a presentation on the possible roles of TNAs in the context of the implementation of the Technology Mechanism. His presentation was based on the workshop background paper on interlinkages between TNAs and national and international climate policymaking processes. He noted that TNAs could have a role in defining technology projects, programmes and strategies with action plans and could serve as input to the development of LCDS, NAMAs and NAPs. He also noted that aggregating information from TNAs could provide information to the TEC on technology needs, barriers and good practices, which could enable the TEC to translate this information into broader policy guidance. He further noted that the CTCN could support developing countries in conducting and updating their TNAs and enhancing the implementation of the results of TNAs. He highlighted a possible facilitative role of networks in linking countries with similar technology, finance and capacity-building needs, acting as a matchmaking body. He concluded by saying that the outputs of TNAs could influence the design of the CTCN in terms of its size and scope.

2. The role of technology needs assessments in enhanced action on technology development and transfer to support action on mitigation and adaptation

51. This session was organized as a panel discussion involving representatives of Parties and international organizations on the possible role of TNAs in enhanced action on technology development and transfer to support action on mitigation and adaptation. The discussion was facilitated by Mr. Kumarsingh and was structured around three guiding questions:

(a) Are the steps of the TNA process (as developed in the updated TNA handbook) well-targeted and sufficient to cover all aspects of the assessment and identification of technology needs?

(b) How could the support related to the identification of technology needs and the implementation of the results of TNAs be further enhanced?

(c) What could be the potential role of TNAs in the light of the implementation of the Technology Mechanism? How could this be achieved?

52. With regard to the targeting and sufficiency of the steps of the TNA process to assess and identify technology needs, a representative of UNEP said that future revisions of the TNA handbook should be driven by the UNFCCC process. A representative from a developed country noted that the TNA handbook should be flexible to be able to guide TNA teams in various environments. A participant from a developing country highlighted that the TNA process, national communications, NAMAs and NAPs should be circular processes that feed into one another. He recommended the development of regional modifications of the TNA handbook. Another participant from a developing country noted that the TNA handbook is not sufficient to cover all aspects of the TNA process and added that it would be useful to assess needs at all stages of the technology development cycle.

53. In relation to enhanced support for the identification of technology needs and the implementation of the results of TNAs, a representative of the International Energy Agency (IEA) encouraged more bottom-up analyses and suggested using an IEA guidebook on creating national technology road maps. A representative of UNEP noted the importance of adequate support to enable developing countries to act on the recommendations contained in the numerous assessments carried out by them. A participant from a developed country noted that technology implementation could be facilitated if planning for it is included in the assessment process, and that the communication of the findings of TNAs should be arranged in parallel. A participant from a developing country reminded participants that facilitating technology implementation is not the only objective of the TNA process.

54. On the potential role of TNAs in the light of the implementation of the Technology Mechanism, a representative of IEA said that it was important for the Technology Mechanism to consider the marginal impacts and technical viabilities of specific technologies. A representative of UNEP noted that the information contained in the TNAs could serve as sound input to the Technology Mechanism but its precise role must be clarified. A participant from a developed country added that the Technology Mechanism will not just be a channel to implement aspects of TNAs; however, he saw the importance of prioritizing high-impact projects.

3. Facilitated breakout sessions

55. The breakout sessions focused on possible strategies and recommendations for improving the TNA process, especially in relation to the implementation of the Technology Mechanism. Possible linkages with mechanisms to deliver financial and technological support, planning processes of national mitigation and adaptation actions, technology road maps and action plans were addressed during the session.

56. Two working groups were established to address issues relating to: the possible role of TNAs in facilitating the delivery of technological and financial support for mitigation and adaptation actions, preparing and implementing national mitigation and adaptation actions and the Technology Mechanism. The breakout sessions were structured around the following areas and guiding questions:

(a) Approaches adopted and methodologies used to conduct TNAs:

(i) Are the steps of the TNA process (as developed in the updated TNA handbook) well-targeted and sufficient to cover all aspects of the identification and prioritization of technology needs?

(ii) Are there other steps that could be added to the TNA process?

(b) Identification of barriers to technology transfer and measures to address barriers and capacity-building:

(i) What is the most efficient strategy/methodology to identify barriers to technology transfer and measures to overcome them? What kind of barriers should be identified: barriers to individual technologies, sectoral barriers or country-specific barriers?

(ii) What could be good practices for identifying policies and measures that could be put in place to overcome those barriers?

(c) Implementing the results of TNAs:

(i) How could the support related to the identification of technology needs and the implementation of the results of TNAs be further enhanced?

(ii) What information needs to be reported in TAPs to enhance the implementation of the findings of TNAs, including policies and measures, programmes and projects?

(d) Interlinkages with other mechanisms, tools and processes:

(i) What could be the potential role of TNAs in the light of the implementation of the Technology Mechanism? How could this be achieved?

(ii) What are the potential linkages between TNAs and mechanisms to deliver financial, technological and capacity-building support; the planning processes of national mitigation and adaptation actions; and technology road maps and action plans?

(iii) How could these potential linkages be enhanced in the light of countries' overall development objectives?

57. Regarding approaches adopted and methodologies used to conduct TNAs, in working group I many participants noted that the TNA process should be enhanced and suggestions were made to hold more frequent TNA training sessions, including seminars and webinars, to exchange experiences among countries that have conducted TNAs. Some participants recommended having a user-friendly tool for countries conducting TNAs which would serve them at any stage of the process. Participants recommended undertaking different processes to identify mitigation and adaptation technologies. Participants noted that TNAs are living documents which should be periodically updated as the needs of the countries evolve. One participant said that one of the key conditions for successful implementation of the results of TNAs is the selection of a knowledgeable and committed project champion.

58. Regarding approaches adopted and methodologies used to conduct TNAs, in working group II some participants highlighted the need to add additional steps to the TNA methodology related to all elements of the technology cycle, focusing also on research and development, the adaptation of identified technologies to local conditions, the development of local technologies, the possibility of joint ventures when facilitating the implementation of indigenous technologies, and undertaking cost–benefit analyses of identified technologies as well as ecological assessments. One participant noted that the TNA handbook is a guidance tool and suggested a less prescriptive approach to determining the

options for conducting TNAs. Another participant recommended creating a knowledge management network based on the TNA process.

59. In terms of the identification of barriers to technology transfer and measures to address barriers and capacity-building, in working group I participants noted the importance of creating collaborative multisectoral networks of stakeholders and also of receiving information and views on the process from outside the country. Participants also stressed the need to update policies to ensure predictability and transparency and to bring TNAs into national climate change planning processes. One participant suggested a computer-based policy scenario to elaborate models for policy options. Another participant noted that the sharing of lessons learned from projects that failed would also be beneficial.

60. In terms of the identification of barriers to technology transfer and measures to address barriers and capacity-building, in working group II participants identified various barriers, such as the TNA process overburdening the capacity of the regional centres, and the difficulty of maintaining installed technologies owing to the poor delivery of, often imported, spare parts. They also noted that the risk of the investment should be taken into account when presenting projects to investors, in order to improve access to finance, and that technology identification should prioritize affordable technologies. Participants stated that many TNAs are lacking barrier analysis or information on the methodology used to analyse barriers. Some participants noted that they would like to know whether feedback was provided on the suitability of used methodologies. On practices for identifying policies and measures, one participant underscored the importance of the private sector and financing institutions being involved early in the process to assist in overcoming barriers using 'outside the box' experiences, while another stressed that the Technology Mechanism should be an essential vehicle in overcoming barriers in order to enhance enabling frameworks for technology transfer.

61. With regard to implementing the results of TNAs, in working group I one participant stressed that identified technologies could be familiarized well before implementation, on the basis of countries' endogenous capacities, and that when an intensive capacity-building process is required then possibly an inappropriate technology has been selected. One participant emphasized the fundamental nature of having a governmental commitment in place when implementing the results of TNAs. Another participant saw technology implementation as the ultimate objective of the TNA process. Regarding TAPs, participants recognized the continuous implementation gap in the TNA process and urged the bridging of this gap. They recommended a mix of national and international elements in the criteria used to identify technologies for implementation. One participant highlighted the need to share information on the implementation of the results of TNAs with multilateral and bilateral donors and the financial community. Another participant noted that funded ESTs should be in line with national priorities.

62. With regard to implementing the results of TNAs, in working group II one participant said that there should be a platform available for the sharing of technologies and project ideas to allow Parties to have access to a wide range of experiences and good practices before their TNAs are conducted. One participant highlighted the role of CTI PFAN in filtering the results of TNAs and said that this role should be strengthened and formally incorporated into the TNA process. Regarding TAPs, participants noted that, with the existing information, it is challenging to develop a TAP. One participant recalled that technology is only a tool for sustainable development and that technology transfer is, in that respect, not an ultimate goal, but a first step.

63. In terms of interlinkages with other mechanisms, tools and processes, in working group I participants considered TNAs to serve as appropriate input to the Technology Mechanism and to be a fundamental element of the work of the CTCN, especially in terms of its scope and scale. Participants recommended that TNAs be integrated into LCDS,

NAMAs, NAPs and other relevant processes. One participant noted that it would be efficient to use the same stakeholders in the conduct of a TNA as in the development of an LCDS. Another participant noted that TNAs are ahead of other related processes on adaptation technologies, as a broad range of adaptation technologies have been introduced and elaborated on in the initial TNA reports. One participant highlighted a need for the provision of guidance to many developing countries on how to select and implement the best available technologies to assist in reducing GHG emissions, while securing the economic development of these countries at the same time. Participants agreed that TNAs need to be linked with and inform the financial community.

64. In terms of interlinkages with other mechanisms, tools and processes, in working group II one participant noted that TNAs should inform other mechanisms, tools and processes, without being prescriptive. He said that TNAs are beneficial, but suggested not to prejudge ongoing negotiations on the Technology Mechanism. He stressed that some of the findings of the workshops, including the linkages between the TNA process and NAMAs and NAPAs, provided a solid start; however, no consensus on these issues has been reached as yet. Another participant noted that TAPs are the next step in the process towards technology implementation, but that today there is little useful guidance on and experience in their development. He highlighted that he sees TAPs as a policy framework within which to promote policy diffusion and the identification of projects, in line with that policy and with financial requirements.

65. Following the breakout sessions, the facilitators of the working groups reported the issues raised by participants in the group discussions.

66. Regarding approaches adopted and methodologies used to conduct TNAs, the facilitators reported the following issues raised by participants:

(a) It would be useful if the TNA methodology could have different processes for the identification and prioritization of mitigation and adaptation technologies;

(b) The TNA handbook should be flexible enough to be used by countries with or without developed national development plans;

(c) TNA teams need to be broadened to cover also barrier analyses, including also experts from abroad;

(d) National context is of importance when conducting TNAs;

(e) TNAs are living documents which require periodical updates as the countries' needs evolve;

(f) The selection of a knowledgeable project champion is fundamental;

(g) It would be useful to add additional steps to the TNA methodology related to all elements of the technology development cycle.

67. In terms of the identification of barriers to technology transfer and measures to address barriers and capacity-building, the facilitators reported the following issues raised by participants:

(a) The creation of collaborative multisectoral networks of stakeholders is essential in order to receive information on overcoming barriers also from outside the country;

(b) To bring TNAs into national climate change processes, there is a need to update policies to ensure predictability and transparency;

(c) To improve access to finance, the risk of the investment should be taken into account when presenting projects to investors;

(d) Technology identification should focus on affordable technologies;

(e) Many TNAs are lacking comprehensive barrier analysis and/or information on the methodology used to analyse barriers;

(f) It is important for the private sector and financing institutions to be involved early in the TNA process in order for them to assist also in overcoming barriers;

(g) The Technology Mechanism could be an essential entity in overcoming barriers.

68. On implementing the results of TNAs, the facilitators reported the following issues raised by participants:

(a) Identified technologies could be familiarized well before being implemented, on the basis of countries' endogenous capacities;

(b) There is an urgent need to bridge the continuous implementation gap;

(c) Having government engagement when implementing the results of TNAs is fundamental;

(d) To identify technologies for implementation, a mix of nationally specific and internationally proven criteria should be applied;

(e) A need to share information with multilateral and bilateral donors and the financial community was recognized;

(f) Funded ESTs should be in line with national priorities;

(g) There should be a platform available for the sharing of technologies and project ideas in order to provide access to good practices and experiences;

(h) CTI PFAN could play a filter role and could be strengthened and formally incorporated into the TNA process;

(i) TAPs are difficult to develop given the current guidance.

69. In relation to interlinkages with other mechanisms, tools and processes, the facilitators reported the following issues raised by participants:

(a) TNAs are considered to serve as appropriate input to the Technology Mechanism and to be a fundamental element of the work of the CTCN in terms of its scope and size;

(b) TNAs are recommended to be integrated into other relevant processes, including NAMAs, NAPAs, national communications and LCDS;

(c) TNAs are considered ahead of other related processes on adaptation technologies, as a broad range of adaptation technologies have been introduced in the TNA process;

(d) TNAs should be linked with and inform the financial community, and further discussions could be held on how such a possible linkage could enhance the assessment of needs and the implementation of the results of TNAs in developing countries;

(e) TAPs are seen as a policy framework within which to promote policy diffusion and the identification of projects, in line with that policy and with financial requirements.

IV. Issues for further consideration

70. During the final session, the chair of the workshop highlighted the outcomes of the workshop. He noted that the exchange of views among participants had contributed to:

(a) Deepening understanding of experiences gained and lessons learned from conducting TNAs;

(b) Gathering insights into further needs and actions that could assist Parties in implementing the results of their TNAs;

(c) Enhancing understanding of the possible role of TNAs in enhancing action on technology development and transfer to support action on mitigation and adaptation.

71. During the workshop, participants raised several issues for further consideration, by identifying gaps in the TNA process and ways and means to overcome those gaps, with a view to enhancing the TNA process.

72. Regarding the conduct and reporting of TNAs, participants highlighted that:

(a) TNAs and TAPs should be conducted in line with national development strategies and the TNA methodology needs to incorporate country specifics;

(b) The MCDA tool is an effective tool for the selection of technologies, which could serve as input to the development of NAPs;

(c) The process of conducting a TNA requires sound coordination, which should be managed by an experienced project champion whose skills are strengthened by a multidisciplinary expert team, in order to be able to deal with numerous political, technical, environmental and social issues;

(d) Before starting the exercise of conducting a TNA, there is a strong need to develop a detailed workplan based on existing data and experience;

(e) Carefully defined criteria for the identification of sectors and technologies, such as GHG emission reduction potential, cost, contribution to socio-economic development, and technology maturity, should be the basis for the identification of appropriate sectors and technologies;

(f) There is a need to put in place mitigation and adaptation technology inventories and databases to facilitate an overview of existing technologies and the selection process;

(g) Knowledge exchange at the national and international levels should be increased and the creation of informal networks in specific technical areas was recommended to be considered for such a purpose.

73. In terms of the implementation of the results of TNAs, the discussions focused on how to engage policymakers in the implementation of such results, how to create appropriate enabling environments and the importance of preparing high-quality project proposals. Participants noted that:

(a) Governmental engagement in the TNA process is fundamental to deliver predictable policies and to create appropriate regulatory frameworks to enable environments for investments, and to participate in innovative funding instruments such as public–private partnerships;

(b) 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;

(c) Enhanced capacity-building on the implementation of ESTs at the decision-making and project levels is fundamental;

(d) Early dialogue with funders is essential to ensure compatibility with their guidelines and funding criteria, as this is a basic criterion for project implementation;

(e) There is a need to enhance the guidance on the development of TAPs, including by developing templates and by sharing experiences gained in their development, and the use of TAPs was considered essential to providing a basis for the implementation of the results of TNAs.

74. In relation to the future of the TNA process, issues raised by participants included:

(a) The importance of capitalizing on the experiences gained and lessons learned from the TNA process for the preparation and implementation of NAMAs, NAPs, LCDS and technology road maps or action plans;

(b) That TNAs could provide information on needs, barriers and good practices, enabling the TEC to translate this information into broader policy guidance;

(c) The importance of creating facilitative and matchmaking networks, to be utilized as an effective vehicle to link countries with similar technology, finance and capacity-building needs;

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