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TECHNOLOGY TRANSFER AND COOPERATION

Proposals for the development of a programme of work on technology transfer and cooperation

Note by the Executive Secretary

EXECUTIVE SUMMARY

1. At its sixth meeting, the Conference of the Parties endorsed, in its decision VI/30, the proposals by the Executive Secretary regarding preparatory work on technology transfer and cooperation as given in section IV of the preparation for the seventh meeting of the Conference of the Parties (UNEP/CBD/COP/6/2). It was decided that SBSTTA would consider technology transfer and cooperation at its ninth meeting and adopt a recommendation for the consideration of the Conference of the Parties, which would include elements for a programme of work on technology transfer.

2. Further to the proposals regarding preparatory work on technology transfer and cooperation endorsed by decision VI/30, the present note provides proposals for the development of a programme of work on technology transfer and cooperation for consideration by SBSTTA. They form the basis for the suggested draft elements of a programme of work on technology transfer and cooperation (UNEP/CBD/SBSTTA/9/7/Add.1).

3. Technology transfer and cooperation was already addressed by SBSTTA at its eighth meeting, in its recommendation VIII/1 B, on mountain biodiversity, and by the Open-ended Inter-Sessional Meeting on the Multi-Year Programme of Work of the Conference of the Parties up to 2010 in its recommendation 4, on the legal and socio-economic aspects of technology transfer and cooperation. Both recommendations and the requests to the Executive Secretary that they entail are reflected in the present note and in the draft elements of a programme of work on technology transfer and technology cooperation.

* UNEP/CBD/SBSTTA/9/1.

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4. Section I of the present note provides a more extensive introduction into the mandate given by decision VI/30 with regard to preparatory work on technology transfer and cooperation. Section II identifies several issues that seem to be of particular importance for successful technology transfer, namely: the assessment of needs for technology transfer, including capacity-building needs; the role of information systems at national and international levels; the role of enabling environments for technology transfer; capacity-building; and implementation support mechanisms. Subsequent sections address these issues in more detail and provide a number of proposals with regard to the development of a programme of work.

5. Section III discusses technology needs assessments as one important element in identifying opportunities for technology transfer. In order to contribute to the identification of such opportunities, these assessments have to include needs for capacity-building. It is argued that such assessments need to be country-driven and be based on stakeholder involvement and consultations. The identification of appropriate assessment methodologies and processes is key for a comprehensive assessment of needs, including a sound prioritization of needs. The building or enhancement of appropriate capacity will often be a key precondition for the effective conduct of such assessments.

6. Section IV addresses the role of national, regional and international information systems on existing technologies as another important precondition for the identification of technology transfer opportunities. Such systems need to be decentralized and reach out to local and traditional communities. They should foster the dialogue between technology holders and potential technology users that is often necessary to properly identify opportunities for technology transfer and adaptation. Given the amount of information on relevant technologies and the related technical expertise that is embodied in existing networks and databases, the strengthening of existing international information networks of expert and research institutions should be prioritized over the creation of new systems. The clearing-house mechanism of the Convention could play an important role in facilitating access to these networks and databases by providing a central gateway.

7. Section V discusses the importance of creating institutional, administrative, legal and policy environments that are conducive to private and public sector technology development, its transfer and to the absorption of transferred technology. Related government activities may, *inter alia*, focus on: (a) institutions that introduce codes and standards, reduce risk and protect intellectual property rights; (b) legal and institutional underpinnings of technology markets both at national and international levels; (c) the removal of technical, legal and administrative barriers to technology transfer and technology absorption; (d) the use of financial and non-financial incentives; (e) fostering national institutions for research and technology innovation.

8. Section VI underlines the importance of capacity-building as a cross-cutting issue for technology transfer and technology cooperation. Capacity-building activities may aim to strengthen abilities for needs assessment, they may contribute to the strengthening of national, regional and international information networks, and they may also be an important factor in the creation of an enabling environment for technology transfer. Importantly, capacity-building not only refers to training and other educational activities, but also to the building or enhancement of institutional capacity.

9. Section VII discusses a number of mechanisms that could be used at the international level to support implementation of the programme of work, such as the establishment of expert bodies as appropriate.

SUGGESTED RECOMMENDATIONS

10. The Subsidiary Body on Scientific, Technical and Technological Advice may wish to adopt a recommendation to the Conference of the Parties along the following lines:

The Subsidiary Body on Scientific, Technical and Technological Advice,

Recalling that, by its decision VI/30, the Conference of the Parties requested SBSTTA to consider the scientific, technical and technological aspects of technology transfer and cooperation at its ninth meeting and to adopt a recommendation that will include elements for a programme of work on technology transfer;

Taking note of recommendation 4 of the Open-ended Inter-Sessional Meeting on the Multi-Year Programme of Work of the Conference of the Parties up to 2010, on the legal and socio-economic aspects of technology transfer and cooperation;

Recalling paragraph 44 (h) of the World Summit on Sustainable Development (WSSD) Plan of Implementation, which calls upon States to provide financial and technical support to developing countries, including capacity-building, in order to enhance indigenous and community-based biodiversity conservation efforts;

Recalling also SBSTTA recommendation II/3 to conduct work on technology transfer within sectoral themes related to the priority issues under its programme of work as set out in recommendation II/12;

1. *Recommends* that the Conference of the Parties at its seventh meeting:

(a) *Adopts* the elements of a programme of work on technology transfer and cooperation as contained in the note by the Executive Secretary on the subject (UNEP/CBD/SBSTTA/9/7/Add.1);

(b) *Decides* that implementation of the programme of work should be undertaken in close coordination with relevant activities under thematic programmes of work and programmes of work of other cross-cutting issues, in order to prevent duplication of work and maximize synergy;

2. *Also recommends* that, as a first phase in implementing the programme of work, the Conference of the Parties should:

Needs assessment

(a) *Invite* Parties and governments to identify relevant stakeholders and sources of information, as well as appropriate mechanisms for effective stakeholder involvement and participation, and to prepare, in collaboration with relevant stakeholders, a national scoping-study to identify: (i) priorities in needs assessment, relevant assessment methodologies, including adaptation needs to national circumstances and priorities; (ii) needs for related building or enhancement of capacity; (iii) the necessary interaction with national biodiversity strategy and action plans as well as with other policy planning tools;

(b) *Invite* Parties, governments and competent international organizations to submit information on the conduct of technology needs assessments, including case-studies and best-practices, and on their applicability and possible adaptation needs for technologies for the conservation and sustainable use of biodiversity, and for technologies that make use of genetic resources, to the Executive Secretary;

(c) *Request* the Executive Secretary to compile the information provided by Parties, governments and competent international organizations, and to prepare a manual for the assessment of technology needs, including relevant assessment methodologies and appropriate processes and mechanisms, for consideration by the eighth meeting of the Conference of the Parties;

Information systems

(d) *Invite* Parties and governments to review national information systems for technology transfer and cooperation, including the identification of best-practices and of needs for further improvements, in particular in regard to the accessibility of such systems for local and traditional communities, to initiate and conduct consultations among relevant organizations and stakeholders with a view to identify options to further cooperation in the development or improvement of information systems on technology transfer and technology cooperation, including on traditional technologies, and to submit the analyses and the outcome of such consultation to the Executive Secretary;

(e) *Requests* the Executive Secretary to prepare proposals on options to develop or strengthen national information systems of technology transfer and technology cooperation, to develop or strengthen south-south information systems of technology transfer and technology cooperation, and to link them to an international information system;

(f) *Requests* the Executive Secretary, in collaboration with the informal advisory committee of the clearing-house mechanism, to develop proposals on the possible role of the clearing-house mechanism as a central mechanism for exchange of information on technologies relevant for the conservation and sustainable use of biodiversity, and for technologies that make use of genetic resources, and to ensure the interoperability with relevant existing systems of national and international information exchange, including technology and patent databases;

Enabling Environments

(g) *Invites* the World Intellectual Property Organization (WIPO) to further explore and analyse the role of intellectual property rights for technology transfer in the context of the Convention, and to identify potential options to increase synergy;

(h) *Invites* Parties and Governments to identify relevant mechanisms and measures, including best-practices as well as existing barriers:

(i) To foster enabling environments that would provide incentives for and facilitate foreign investment and the absorption and diffusion of relevant technologies, including relevant technologies that arise from the use of knowledge, innovations and practices of indigenous and local communities, and that would provide south-south cooperation,

(ii) To provide financial and non-financial incentives to private-sector actors as well as public research institutions, to encourage the transfer of technologies to developing countries, through, e.g., technology transfer programmes or joint-ventures,

(iii) To promote the transfer and use of relevant technologies that arise from the use of knowledge, innovations and practices of indigenous and local communities,

(iv) To promote and advance priority access for Parties to the results and benefits arising from biotechnologies based upon genetic resources provided by those

Parties, and to promote the effective participation in related biotechnological research and development by those Parties,

as a first step to develop national strategies and action plans for enabling environments for technology transfer and cooperation in accordance with the programme of work on technology transfer and cooperation, and to submit such information to the Executive Secretary;

(i) *Requests* the Executive Secretary to compile and analyse the information received and to develop proposals on options to apply such measures and mechanisms;

Capacity-building

(j) *Invites* Parties and governments to submit information on identified needs to build or enhance capacity for (a) the assessment of technology needs; (b) developing or improving information systems; and (c) creating an enabling environment to the Executive Secretary;

(k) *Requests* the Executive Secretary to make such information available through the clearing-house mechanism and other means as appropriate;

(l) *Invites* international, regional and national donors and relevant international organization to support the building or enhancement of capacity along the identified needs, and to support the development of national strategies and action plans to foster enabling environments for technology transfer and cooperation, in particular with regard to:

(i) Building policy, legal, judicial and administrative capacity;

(ii) Facilitating access to relevant proprietary technologies;

(iii) Providing other financial and non-financial incentives for the diffusion of relevant technologies;

(iv) Supporting, if feasible and appropriate, the design and implementation of additional supportive policy measures to the introduction or strengthening of national intellectual-property-rights regimes, in order to mitigate any negative side-effects and to maximize benefits;

(v) Building capacities of, and empowering, indigenous and local communities with respect to access to and use of relevant technologies as well as providing opportunities for promoting the use of technologies arising from the use of their knowledge, innovations and practices and benefiting from their transfer, including community-to-community transfers;

(vi) Providing support to improve the capacity of national research institutions for the adaptation and further development of imported technologies;

(vii) Supporting the development and operation of regional or international initiatives to assist technology transfer as well as scientific and technical cooperation, particularly those initiatives designed to facilitate south-south cooperation and south-south joint-development of new technologies.

Implementation support mechanisms

(m) *Invites* Parties, governments and competent international organizations to submit nominations for a roster of experts on technology transfer and cooperation; and

(n) *Requests* the Executive Secretary to compile such nominations and maintain the roster of experts accordingly;

(o) *Decides* that the Ad Hoc Expert Group on Technology Transfer and Cooperation shall assist in the implementation of the programme of work, and, in particular, in:

(i) The development of a manual for technology needs assessment;

(ii) The preparation of proposals on options to apply institutional, administrative, legal and policy measures and mechanisms, including best-practices as well as corresponding barriers, to facilitate access to and absorption of technologies on the public domain and to proprietary technologies, by developing countries and countries with economies in transition.

I. INTRODUCTION

1. In paragraph 1 of Article 16 of the Convention on Biological Diversity, the Parties to the Convention recognize that both access to and transfer of technology among contracting Parties are essential elements for the attainment of the objectives of the Convention. The central importance that Parties attach to technology transfer is further underlined by the fact that no less than four articles of the Convention touch on the subject. 1/ In Article 19, technology transfer is mentioned specifically as a means of achieving the equitable sharing of benefits from the use of genetic resources, one of the main objectives of the Convention. Moreover, at each of the six meetings held to date, the Conference of the Parties has adopted decisions that confirmed the need for technology transfer and cooperation to successfully implement the provisions of the Convention.

2. At its fourth meeting, the Conference of the Parties decided, in its decision IV/16, that, as part of its long-term programme of work, transfer of technology and technology cooperation would be subject for in-depth consideration at its seventh meeting.

3. At its sixth meeting, the Conference of the Parties endorsed, in its decision VI/30, the proposals by the Executive Secretary regarding preparatory work on this issue, as given in section IV of the preparations for the seventh meeting of the Conference of the Parties (UNEP/CBD/COP/6/2). These proposals, *inter alia*, suggested that SBSTTA would consider technology transfer and cooperation at its ninth meeting and adopt a recommendation for the consideration of the Conference of the Parties. That recommendation would include elements for a programme of work on technology transfer.

4. Subsequently, the SBSTTA Bureau decided that SBSTTA was not well-placed to address the legal and socio-economic aspects of technology transfer and requested that this aspect be included as part of the agenda of the Open-ended Inter-Sessional Meeting on the Multi-Year Programme of Work of the Conference of the Parties up to 2010. The Bureau of the Conference of the Parties agreed to that request, while expressing the view that the SBSTTA mandate covers advice on legal and socio-economic issues.

5. SBSTTA addressed technology transfer and cooperation at its eighth meeting, held in Montreal from 10 to 14 March 2003, in its recommendation VIII/1 B, on mountain biodiversity. The Open-ended Inter-Sessional Meeting on the Multi-Year Programme of Work of the Conference of the Parties up to 2010, held from 17 to 20 March 2003, took up the issue under item 6 of its agenda, based on a note by the Executive Secretary (UNEP/CBD/MYPOW/5), and adopted recommendation 4, on the legal and socio-economic aspects of technology transfer and cooperation. These recommendations are reviewed in greater detail in the review of the status of implementation of decision on technology transfer and cooperation (UNEP/CBD/SBSTTA/9/7/Add.2). Both recommendations and the requests to the Executive Secretary that they entail are reflected in the present document and in the draft elements of a programme of work on technology transfer and technology cooperation (UNEP/CBD/SBSTTA/9/7/Add.1).

6. The proposals by the Executive Secretary regarding preparatory work for the seventh meeting of the Conference of the Parties as endorsed by the sixth meeting of the Conference of the Parties suggested in paragraph 60 (a) that the Executive Secretary will:

1/ Articles 12, 16, 18 and 19. See section II of the note by the Executive Secretary prepared for the Inter-Sessional Meeting (UNEP/CBD/MYPOW/5) for further discussion.

(a) Prepare a review of the status of implementation of all the decisions taken by the Conference of the Parties, relevant to the implementation of Articles 16 and 18 and related provisions, partly based on national thematic reports to be requested by the Conference of the Parties at its sixth meeting, and other national reports;

(b) Initiate a compilation and assessment of existing technologies for conservation and sustainable use of biodiversity, including from local and indigenous communities, as they are required and applied in the Convention work programmes on thematic areas and cross-cutting issues;

(c) Draft, on the basis of these reviews, and in collaboration with relevant organizations and bodies, proposals for consideration by SBSTTA and for the future work of the Conference of the Parties;

7. The proposals for consideration by SBSTTA and for the future work of the Conference of the Parties are to address:

(a) Assessment of the needs for specific existing technology;

(b) Consideration of the needs for new technologies;

(c) Identification of action required to transfer needed technology; and

(d) Activities for the establishment of an enabling environment for the use and development of technologies, taking into account policy, legal and socio-economic considerations;

8. The present note provides such proposals for consideration by SBSTTA. They form the basis for the suggested draft elements of a programme of work on technology transfer and cooperation as provided in the note by the Executive Secretary on draft elements of a programme of work on technology transfer and cooperation (UNEP/CBD/SBSTTA/9/7/Add.1). A review of the status of implementation of all the decisions taken by the Conference of the Parties relevant to the implementation of Articles 16 and 18 and related provisions is given in the review of the status of implementation of decisions on technology transfer and cooperation (UNEP/CBD/SBSTTA/9/7/Add.2). This document also includes a preliminary analysis of the thematic reports on technology transfer and cooperation, based on the reports submitted by Parties as of 15 June 2003, as well as an updated analysis of the sections of the second national reports pertaining to technology transfer and technology cooperation. Finally, an indicative list of existing technologies for conservation and sustainable use of biodiversity is provided in an information document.

9. Section II reviews several issues that seem to be of particular importance for successful technology transfer, namely: (a) the assessment of needs for technology transfer, including capacity building needs; (b) the role of information systems at national and international levels; (c) the role of enabling environments for technology transfer, and capacity-building. The subsequent sections III-VI address these issues in more details and provide a number of proposals with regard to the development of a programme of work. Finally, section VII gives further guidance on the general design of the programme of work and on activities that could be envisaged to support its implementation.

II. DEVELOPMENT OF A PROGRAMME OF WORK ON TECHNOLOGY TRANSFER: GENERAL CONSIDERATIONS

10. The framework for technology transfer and cooperation under the United Nations Framework Convention on Climate Change (UNFCCC) seems to be relevant to the needs of the Convention on Biological Diversity. The Conference of the Parties to the UNFCCC has recognized that the successful

development and transfer of and access to environmentally sound technologies and know-how requires a country-driven approach, at a national and sectoral level, and should involve cooperation among various stakeholders. By decision FCCC/CP/2001/13/Add.1, the Conference of the Parties, at its seventh meeting, adopted a framework for meaningful and effective actions to enhance the implementation of Article 4, paragraph 5 of the Convention, identifying the following key themes and areas for meaningful and effective action: (a) technology needs and needs assessments; (b) technology information; (c) enabling environments; (d) capacity-building; and (e) mechanisms for technology transfer.

11. The implementation of envisaged activities under these items is in an advance stage. For instance, technology needs assessment forms an important part of an integrated set of activities to improve technology transfer. Countries are asked to submit their prioritized technology needs and the Global Environment Facility is directed to provide funding to developing countries to assist with the process of technology needs assessment. There are now more then 60 countries in the process of assessing their technology needs under the funds from the Global Environment Facility (GEF) through the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP). A handbook on methodologies for technology needs assessment as they relate to climate change is under preparation by UNDP/GEF. 2/

12. Work on information systems for technologies that are relevant for the UNFCCC is also in an advanced stage. A web-based information tool was developed that complements and works with existing web-sites/clearing houses of other relevant international organizations and national/regional technology information centers. 3/ It includes a search engine which enables users to access distributed sources of information, performs conversions between different classifications used by those sources, and present integrated results.

13. While the specific technologies addressed under UNFCCC and the Convention on Biological Diversity differ, the conceptual issues arising in developing an approach to deal with technology transfer and cooperation are similar. It is therefore suggested to follow the approach of the United National Framework Convention on Climate Change in designing the programme of work of the Convention on Biological Diversity on technology transfer and technology cooperation. Such a proceeding does not only prevent duplication of work. In ensuring consistency of the programmes, it would also maximize synergies with UNFCCC on technology transfer and cooperation. Indeed, as the methodological and conceptual issues and related problems may often be very similar, collaboration with UNFCCC on this issue would be very useful. Moreover, the framework developed under UNFCCC is also well in line with the areas that were identified by the Norway/United Nations Conference on Technology Transfer and Capacity Building, held in Trondheim from 23 to 27 June 2003, as key areas for technology transfer and cooperation. 4/

14. It is therefore suggested to base the programme of work of the Convention on Biological Diversity on technology transfer and cooperation on five components:

(a) Assessment of technology needs, including capacity building needs;

2/ UNDP/GEF (2003): Simple Steps, effective actions. A UNDP/GEF Handbook on methodologies for technology needs assessment. Available at http://ttclear.unfccc.int/ttclear/jsp/index.jsp

3/ http://ttclear.unfccc.int/ttclear/jsp/index.jsp

4/ The Trondheim Conference identified the following key areas: technology needs, including both the identification of needs and of where and how to find possible solutions, including, *inter alia*, through a more proactive use of the Clearing House Mechanism; capacity building needs; and the enabling environment. See the *Chairman's report: conclusions and recommendations from presentations and discussion.* Norway/UN Conference on Technology Transfer and Capacity Building, Trondheim, Norway from 23 to 27 June 2003.

(b) Information systems;

(c) Enabling environments;

(d) Capacity building;

(e) Implementation support mechanisms;

15. The first two elements are crucial for the identification of transfer opportunities, which, in turn, is a key precondition for the successful transfer of technologies. Indeed, the identification of any transfer opportunity logically includes two necessary activities:

(a) The *identification of technology needs*, on local and national levels, including the identification of gaps in capacity that may impede the transfer of technology;

(b) The *identification of existing technologies* that could satisfy the identified needs.

To use a market analogy, these activities entail exploring the "demand" and the "supply" side of technology transfer. The *conduct of assessments*, on the appropriate levels, is required to explore the demand side, that is, to identify technology needs and related capacity-building needs. To explore the supply side, that is, to identify technologies, the *establishment or strengthening of information systems* at national and international levels is necessary.

17. The third programme element refers to the creation of an institutional, administrative, legal and policy environment that is conducive to private and public sector technology transfer and to the absorption of transferred technology. Related government activities may, *inter alia*, focus on: (a) institutions that introduce codes and standards, reduce risk and protect intellectual property rights; (b) legal and institutional underpinnings of technology markets both at national and international levels; (c) the removal of technical, legal and administrative barriers to technology transfer and technology absorption; (d) the use of financial and non-financial incentives, and on fostering national institutions for research and technology innovation.

16. The fourth programme element refers to the development of the abilities embodied in a country's peoples and institutions to identify, transfer and absorb technologies. Hence, the programme element is of a cross-cutting nature. Capacity-building activities may aim to strengthen abilities for needs assessment, they may contribute to the strengthening of national, regional and international information networks, and they may also be an important factor in the creation of an enabling environment for technology transfer. Importantly, capacity building not only refers to training and other educational activities, but also to the building or enhancement of institutional capacity.

17. The fifth programme element refers to a number of mechanisms at the international level to support implementation of the programme of work, such as the establishment of expert bodies as appropriate.

18. The following sections will review these programme elements in more detail. They review analytical information on scientific, legal and socio-economic aspects of technology transfer and cooperation in the context of the Convention on Biological Diversity, building on earlier documentation prepared by the Secretariat 5/ as well as additional information gathered by the Secretariat, on the information contained in the thematic reports as submitted prior to 15 June 2003, summarized in the review of the status of implementation of decisions on technology transfer and cooperation

5/ See documents UNEP/CBD/COP/2/17, UNEP/CBD/COP/3/21 and UNEP/CBD/MYPOW/5.

(UNEP/CBD/SBSTTA/9/7/Add.2), and on the presentations and discussions at the recent Norway/United Nations Conference on Technology Transfer and Capacity-Building, held in Trondheim from 23 to 27 June 2003.

19. These sections will adopt the general approach and conceptual distinctions commonly used in the discussion on technology transfer as they were introduced in the note by the Executive Secretary prepared for the Inter-Sessional Meeting (UNEP/CBD/MYPOW/5). Notably, they will endorse the concept of soft technology, that is, a view of technology as being based on knowledge. This knowledge is brought about both through research and innovation (moving ideas from invention to new products, processes and services in practical use), and through a complex and often costly process involving learning from others. 6/ In consequence, many 7/ have concluded that technology transfer is most fundamentally a complex process of learning. 8/

III. ASSESSMENT OF NEEDS FOR TECHNOLOGY TRANSFER, INCLUDING CAPACITY-BUILDING NEEDS

20. As explained earlier, the *conduct of assessments* is required to explore the demand side of technology transfer, that is, to identify technology needs and related capacity building needs. Clearly, the needs for technology transfer depend on national socio-economic conditions. As such conditions largely differ between countries, a once-for-all assessment, or a simple transfer of assessment results among countries, is not possible.

21. Even on the national level, to undertake such an assessment may be a challenging task. This will in particular be the case if the assessment focus is on the technology needs of local and traditional communities in developing countries. Such communities are usually detached from national and international research communities as well as from national processes of decision and policy making. Given the remoteness of rural communities, government officials or researchers located in national capitals may not be well informed of their needs. 9/ Hence, even for an individual country (for which its general socio-economic conditions can be spelt out), to undertake such an assessment may not be trivial.

22. The task is further exacerbated by the fact that technology needs are based on the judgments of individuals and communities, which, in turn, are rooted in specific social relations as well as cultural values and belief systems. In particular, the willingness to adopt a new technology will not only depend on its relative economic advantage. Factors such as its impact on social value and prestige, its compatibility with vested interests and the ease with which its advantages can be observed are also decisive. Such cultural conditions may largely differ among social groups even within an individual country, which again indicates

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6/ Kranzberg, M., 1986: *The Technical Elements in International Technology Transfer: Historical Perspectives. In The Political Economy of International Technology Transfer*. J. R. McIntyre, D.S. Papp, (eds.), Quorum Books, New York, pp.31-46.

7/ See Kranzberg 1986, ibid.

8/ The concept is also used in the note by the Executive Secretary on promoting and facilitating access to, and transfer and development of technology (UNEP/CBD/COP/3/21) prepared for the third meeting of the Conference of the Parties. For a discussion, see Lesser, W. (1997): *The Role of Intellectual Property Rights in Biotechnology Transfer under the Convention on Biological Diversity*. ISAAA Briefs No. 3. http://www.isaaa.org/publications/briefs/Brief_3.htm. For a discussion of different definitions of technology, see also IPCC (2001): *Methodological and Technological Issues in Technology Transfer*. Special Report of Working Group III of the Intergovernmental Panel on Climate Change, section 1.4 (http://www.grida.no/climate/ipcc/tectran/).

9/ See Kakande, Margaret: *Technology collaboration: the challenges of including the poor.* Presentation at the Norway/UN Conference on Technology transfer and Capacity Building, Trondheim 23 – 27 June 2003.

that general approaches may not be appropriate. 10/ Indeed, ignoring these cultural factors and deriving technology needs in a technocratic way, based on its alleged economic advantages alone, may actually guarantee failure.

23. A number of conclusions can be drawn from these observations. First, the assessment of technology needs is necessarily a country-driven process. In the light of largely varying socio-economic and cultural conditions, it is not up to international organizations or processes to decide which technologies are required and therefore of particular interest for transfer. Moreover, national Governments also play a decisive role in the transfer of needed technologies through the creation or improvement of an institutional, administrative, legal and policy environment that is conducive to technology transfer. In the draft programme of work, a number of activities are therefore spelled out whose implementation would fall under the prerogative of Parties.

24. National Governments face a number of difficult questions in identifying and assessing technology needs. These include: 11/

(a) Who should decide which technologies are relevant?

(b) Given limited capacity and funds, which needs are to be addressed first within a national strategy for technology transfer?

(c) What criteria should be used for prioritizing technology development and transfer for the various communities?

(d) How are these communities kept updated on recent technology developments, in the light of their remoteness and their low literacy levels?

25. These challenges lead to the second conclusion. The identification of appropriate assessment methodologies and, in particular, the choice of suitable procedures is key for accurate and comprehensive assessments. In particular, assessments need to be based on well-designed processes of stakeholder involvement and intensive national consultations. The specific design for these stakeholder involvement and consultation processes chosen by national governments will again depend on national circumstances such as the established systems and traditions of policy and decision-making.

26. Given the importance of well-chosen assessment methodologies and processes to ensure, *inter alia*, adequate stakeholder consultations, and the dependence of the assessment design on national socio-economic and political peculiarities, national governments should put efforts in a careful crafting of such assessment processes, including the identification of appropriate methodologies and mechanisms, prior to the actual assessment. In the draft programme of work, it is therefore proposed that governments should develop national guidelines and a national strategy for conducting assessments of needs in technology transfer and cooperation.

27. However, even while it will be up to countries to decide how to best conduct such assessments, it may be useful to develop international policy guidance on needs assessments methodologies. For instance, a handbook on needs assessment, to be developed by competent international organizations in close cooperation and consultation with Parties to the Convention and relevant stakeholders, could compile methodologies and mechanisms to conduct such assessments and point to options for the application of

10/ See for a further discussion McNeely, Jeffrey: *Cultural challenges to technology transfer*. Presentation at the Norway/UN Conference on Technology transfer and Capacity Building, Trondheim 23 – 27 June 2003.

11/ See Kakande, Margaret: *Technology collaboration: the challenges of including the poor.* Ibid.

such methodologies and mechanisms. Such work could be inspired by the technology needs assessment handbook that was recently developed by UNDP/GEF to support the transfer of technologies of relevance under the United Nations Framework Convention on Climate Change (UNFCCC).

28. As the assessments are necessarily based on elaborated processes, the third conclusion is that related capacities need to be built or enhanced in particular in developing countries. It should therefore be ensured that appropriate capacity-building activities are undertaken. In the draft programme of work, such activities are envisaged under the forth programme element "capacity-building". At the same time, the assessment should also seek to identify important capacity gaps that would need remediation for a successful transfer of needed technologies.

29. Past efforts to comprehensively conduct needs assessments by developing countries were often frustrated by the fact that identified technology needs did not match with existing technology nor with the research incentives of the international research community. 12/ It should therefore be ensured that all available information on existing technologies and the technology developments that are to be expected in the future are comprehensively fed into the assessment process. The establishment or strengthening of effective international and national information systems on available and new technologies of relevance to the Convention on Biological Diversity is a crucial precondition. This issue is taken up in the next section.

IV. INFORMATION SYSTEMS FOR TECHNOLOGY TRANSFER AND COOPERATION

30. The implementation or strengthening of information-exchange systems on relevant technologies will lower the search costs of prospective users and providers in identifying transfer opportunities and will therefore often be indispensable for a successful transfer of technology. This observation holds true irrespective of the ownership status of the technology, that is, it holds both for proprietary technologies and for technologies in the public domain. Indeed, the fact that technologies are legally in the public domain does not imply that potential users of such technologies in developing countries are informed of their existence. These users face severe constraints in terms of expertise and the financial capacity to access information on existing technologies in developed countries.

31. In this context, it is also noteworthy that the mere *information* on the existence of proprietary technology may be comparatively easy to acquire, because the entry of a technological innovation into a publicly accessible registry or database is usually a precondition for acquiring protection of intellectual property on that innovation. An important activity under this programme element should therefore be to tap the information contained in national and international patent databases in accordance with the objectives of the Convention on Biological Diversity, in collaboration with important international partners like WIPO or UNCTAD. 13/

32. It is imperative that such systems be implemented or strengthened at both national and international levels, possibly within an overall biological diversity knowledge management system. Because of the severe constraints of many potential users in developing countries with regard to accessing relevant information, international information exchange systems need to be closely linked to national systems of information gathering and dissemination, which could for instance be operated through a network of national research institutions.

12/ Oral communication by John Mugabe at the Norway/UN Conference on Technology transfer and Capacity Building, Trondheim 23 – 27 June 2003.

13/ Such collaboration is already envisaged in the recommendation of the MYPOW meeting. See paragraph 2 (b) of recommendation 4, reproduced in document UNEP/CBD/COP/7/5.

33. National information systems need to be decentralized and give a strong role to front-line staff, familiar with the needs and capacity constraints of local and traditional communities. Indeed, such systems need to implement a two-way flow of information. As explained above, the involvement and consultation of local stakeholders as potential technology users is key for the identification of transfer opportunities. To effectively identify such opportunities, information on local technology needs has to be available at national and, subsequently, international levels. However, the identification of local technology needs will often be vacuous in blissful ignorance of which technologies are actually available. Hence, information on available technology also needs to be accessible at the local level. Information systems should foster the dialogue between technology holders and potential technology users that is often necessary to properly identify opportunities for technology transfer.

34. Information exchange systems are also important during the phase of implementing the use of the imported technology and adapting it to local conditions. Such systems should inform national policy-making institutions on further needs to mitigate any negative impacts of technology transfer, so as to ensure that they can formulate adequate policy responses, such as the regulation of further use of such technology, on a timely and comprehensive basis. Furthermore, national and international research institutions should be informed on further research needs on the technical adaptation of transferred technologies. Such information would ensure that research agendas are tailored to the needs of local stakeholders and adapted to their local conditions. In consequence, information exchange systems need to link local stakeholders and technology users, national administrative and policy-making bodies as well as national and international research institutions. The improvement of such information exchange systems may warrant international cooperative efforts.

35. A close linkage to local and traditional communities is also crucial to identify and disseminate information on options for the transfer of traditional technologies, based for instance on neglected and underutilized plant species. For instance, in the field of traditional medicines, such a linkage would enable research institutions to conduct ethno-botanical and phyto-chemical studies, including toxicity testing, as well as in-vitro and clinical research of the effectiveness of herbal medicines. 14/ To provide an appropriate regulatory framework for accessing such traditional technologies while protecting associated knowledge, innovations and practices and ensuring the fair and equitable sharing of benefits arising out of the utilization of such technologies will be an important element of creating a legal and administrative environment that is conducive to the transfer of traditional technologies. This issue will be further discussed in section V below.

36. Given the amount of information on relevant technologies and the related technical expertise that is embodied in existing networks and databases, the strengthening of existing international networks of expert and research institutions in providing such information exchange, such as the Consultative Group for International Agricultural Research (CGIAR), should be prioritized over the creation of new systems. For instance, institutions such as IPGRI and its Global Facilitation Unit that aim to improve the knowledge base on neglected and underutilized plant species and related technologies 15/ are important partners in the identification and international dissemination of options for the transfer of traditional technologies. 16/ Such

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14/ See Padulosi, Stefano: *Realizing the benefits in neglected and underutilized plant species through technology transfer and human resources development.* Presentation at the Norway/UN Conference on Technology transfer and Capacity Building, Trondheim 23 – 27 June 2003.

15/ See Padulosi, Stefano, ibid.

16/ The webpages of the UNFCCC sub-programme on technology and of the UNEP International Environmental Technology Center provide other examples as they include links to a number of internet-based databases on relevant technologies. See http://ttclear.unfccc.int/ttclear/jsp/index.jsp and http://www.unep.or.jp/ietc/database/index.asp , respectively.

prioritization would prevent the duplication of activities and the over-centralization of information-exchange systems.

37. Many developing countries have gained considerable experience in developing technological solutions that are well adapted to their national socio-economic circumstances. Such technologies may be particularly promising candidates for a successful transfer to countries or regions with similar conditions. The establishment or strengthening of south-south information networks between relevant institutions such as universities and other research institutions should therefore be given particular attention. Such networks could also include e-learning systems or virtual universities and open content communities, as is envisaged for instance under the African virtual open initiatives and resources (AVOIR) network. 17/

38. With regard to the establishment of international information systems, there seems to be an opportunity for the Clearing House Mechanism of the Convention to develop a central international gateway for the exchange of information on technology transfer and technology cooperation as relevant for the Convention. 18/ The Clearing House Mechanism could also provide access to information on identified national technology needs, to available databases on relevant proprietary technologies and technologies in the public domain, as well as information on best-practices to create enabling environments for technology transfer and technology cooperation.

39. In particular, a web-based portal under the clearing-house mechanism should be designed with sufficient flexibility to act as a meeting space for international organizations, Parties, Governments and stakeholders of technology transfer and technology cooperation, while also providing a catalogue and gateway to access other existing information, through hyperlinks to other databases, to full-text or to other information hosted elsewhere, including examples of best-practices or case-studies.

40. Further development of the portal could also include a database to host information on proprietary technologies and on technologies in the public domain. Different search criteria would be available to assist in the searching, locating and downloading of information tailored to the needs of the Parties to the Convention on Biological Diversity, would also be available. The design of the database would take into account the need to host data locally and be interoperable with other existing information systems. Metadata based on a controlled vocabulary on technology transfer, development and cooperation, could describe the holdings of the portal, and assist making information interoperable and searchable. For instance, the vocabulary could provide cross-references to the areas of work on the Convention, as envisaged in paragraph 2 (d), recommendation 4 of the Inter-Sessional Meeting. Protocols used by the portal would also be made publicly available, and would further assist in making data interoperable. Various systems for registering information directly in the database from remote locations could be made available, ensuring equitable and full participation by Parties, Governments and regions. In this manner, the database could evolve as the mechanism within a distributed interoperable network of relevant information databases and resources.

41. The portal would also host virtual meeting spaces where international organizations, Parties and Governments could share information and discuss issues pertaining to technology transfer, development and cooperation. Tools to ensure effective dialogue and collaborative work have been developed by the

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17/ See Keats, D.: *Creating South-South synergy in biodiversity and related disciplines through the creative application of information and communication technologies.* Presentation at the Norway/UN Conference on Technology transfer and Capacity Building, Trondheim 23 – 27 June 2003.

18/ These following proposals are consistent with and supportive of the goals outlined in the Strategic Plan of the Clearing House Mechanism, which views access to and transfer of technology as one of the six key areas under the promotion and facilitation of technical and scientific cooperation. See document UNEP/CBD/COP/5/INF/3, p. 3.

Clearing House Mechanism and could be adapted easily to meet the needs of international organizations, Parties, Governments and stakeholders. Moreover, a feedback mechanism would be available on the portal, ensuring that the design of the portal and database meets fully the needs of its users, and assisting the Secretariat to identify problems related to its use.

42. Cooperation with existing initiatives and systems of information dissemination would be encouraged and promoted. Possible international partners include, for instance, the Sustainable Alternatives Network, a joint project between the United Nations Environment Programme and the Global Environment Facility. 19/ As explained above, the Consultative Group on International Agricultural research (CGIAR) centres, the UNEP International Environmental Technology Centre, and, for proprietary and traditional technologies, the World Intellectual Property Organization, may also be important partners. Indeed, such cooperation with other international organizations and initiatives should be given priority and be viewed as an effective and timely means to further access to and transfer of technology through the clearing-house mechanism.

V. ENABLING ENVIRONMENTS FOR TECHNOLOGY TRANSFER

43. Creating enabling environments refers to activities of governments at national and international levels that aim to create an institutional, administrative, legal and policy environment conducive to private and public sector technology transfer and to the absorption of transferred technology, and that aim to remove technical, legal and administrative barriers to technology transfer and technology absorption. Conceptually, such activities can be distinguished according to whether they focus on fostering the *provision* of technologies for export or on the *reception and absorption* of imported technologies. While many countries may be mainly providing or mainly receiving technologies, it has to be borne in mind that individual countries may sometimes simultaneously provide and receive technologies from abroad. Hence, this distinction should not be misconceived to necessarily imply a differentiation into provider and recipient countries.

A. Enabling environments for receiving and absorbing technologies

1. Fostering foreign direct investment

44. Measures to foster foreign direct investment seem to be an important element for enabling environments for the transfer of proprietary technology. Foreign direct investment is the dominant mechanism for technology transfer to developing countries, accounting for more than 60% of the flow of technology to these countries. As decision-making regarding such investment and trade activities is influenced in part by the state of law and legal institutions in the potential recipient country, local law has the potential to reduce the risks and transaction costs associated with investment and trade and will therefore have an impact on investment and trade patterns and the types of technologies selected. 20/

45. A number of imperatives need to be addressed in order to attract investment and technology flows. First, the legal environment should be conducive to foreign investment. This entails the promulgation of foreign investment protection laws to guard against expropriation and of competition laws to facilitate the operation of open markets. Repatriation and expropriation guarantees are also important components of an enabling environment for foreign investment. Second, investors need to be assured that contractual

19/ The initiative provides online access to technology and know how on how to improve resource efficiency in the agriculture, energy and textile sectors, many of which are relevant for the Convention on Biological Diversity. See: http://www.sustainablealternatives.org/

20/ Krattiger, A. F. (2001), ibid, page 18-19.

obligations will be enforced through transparent and effective judicial processes, and that administrative processes will not impose high transaction costs through cumbersome procedures relating to licensing, tariff setting, taxation and foreign exchange controls. It has therefore been asserted that to the extent that domestic legal institutions are deficient in managing contractual, property and regulatory risks, perverse incentives will be generated that distort technology choices and supporting financial flows in ways that discourage rapid international diffusion of environmentally sound technologies. 21/ International cooperation and finance can play an important role in the building of judicial and administrative capacity, as will be further explained in section VI below. 22/

2. The role of intellectual property rights systems

46. Another important aspect of enabling environments for the transfer of proprietary technology, and in particular for technologies that make use of genetic resources, pertains to the role of intellectual property rights. 23/ On the one hand, it is often argued that strong domestic intellectual property rights regimes encourage technology transfer, by reassuring owners of proprietary technology that their rights will be protected. Potential suppliers of technologies are more willing to voluntarily transfer technology, especially technology that is easily to be copied, if the recipient country has an effective intellectual-property-rights regime in place. Moreover, the protection of intellectual property rights may also operate as incentive for research and development, particularly in those sectors where fixed costs for research and development are high. 24/

47. However, it has also been pointed out that a strong intellectual property rights regime is not a sufficient precondition for improving the incentives for private companies to engage in the transfer of such technologies, as a number of other economic conditions also have to be met. The size of the prospective market is one of these conditions of particular importance. 25/

48. On the other hand, it has been affirmed that stronger intellectual-property-rights regimes may actually impede technology transfer, in particular to developing countries. 26/ This claim is based on a number of arguments:

(a) While a strong intellectual-property-rights regime might arguably generate incentives on the side of the owner of such technology to actively search for opportunities for transferring such technology through licensing, governments and local investors in developing countries may simply not have the resources to pay related fees;

(b) Moreover, depending on the intricacies of the patenting system, it may substantially increase transaction costs for prospective users and thus erect potential barriers for technology transfer; 27/

21/ See the IPCC special report *Methodological and Technological Issues in Technology Transfer*, referred to in note 8 above.

22/ See Krattiger (2001), ibid, page 29-30.

23/ A discussion on the role of intellectual property rights, including the role of the TRIPs Agreement and a discussion of the Study of the Royal Commission on Intellectual Property Rights, commissioned by the government of the United Kingdom, is provided in document UNEP/CBD/MYPOW/5.

24/ See Lesser, W. (1997): *The Role of Intellectual Property Rights in Biotechnology Transfer under the Convention on Biological Diversity*. ISAAA Briefs No. 3, page 8; WTO (1996): *Factors affecting transfer of environmentally-sound technology: note by the WTO Secretariat* (WT/CTE/W/22), pages 4-5.

25/ See the discussion in document UNEP/CBD/MYPOW/5.

26/ The World Bank, 1998: World Development Report.

(i) First, different institutions or companies may have different views on the value of a proprietary technology and the related fees to pay. Negotiations over access to technology can belong and complicated, imposing delays and administrative costs;

(ii) Second, the proliferation of patents in biotechnology may lead to the need to negotiate multiple licenses when engaging in the development of specific product lines. Such patent thickets, and the subsequent stacking of royalties, may raise both transaction costs and the ultimate cost of the product, possibly leading to a "tragedy of the anti-commons"; 28/

(iii) Third, the so-called reach-through claims, that is, patents for research tools that claim royalty payments on any product that was developed by using this tool, may also contribute to increased product development costs and may therefore negatively affect technology transfer;

(iv) And last but not least, blocking patents or overly broad patents are sometimes feared to discourage the use of related technologies and, if granted on early, foundational discoveries, to slow the pace of research and development in a particular field;

49. Importantly, it may be the prospect alone to face prohibitive license fees and/or transaction costs that may already have a chilling effect on potential users to put sufficient efforts into the identification of transfer opportunities. As a result, such transfer opportunities may only be imperfectly identified.

50. A recent expert workshop organized by the Organisation for Economic Co-operation and Development (OECD) Working Party on Biotechnology concluded that, while the obstacles imposed by these mechanisms are sometimes substantial, actors such as firms, Governments and civil society in OECD countries are rapidly reorganizing their approaches to dealing with intellectual property rights protection, and often find pragmatic solutions to the problems enumerated above. 29/ However, it appears to be less clear whether and to what extent this finding also applies to the relevant actors in the developing world. Hence, further research is warranted to assess the importance and the scope of the potential obstacles enumerated above in developing countries, and possible remedial action. Such research could fruitfully be undertaken by competent international organizations active on this field, such as the World International property Organization (WIPO) or the United Nations University. It is noteworthy that, depending on the outcome of this research, remedial policy action may also need to be undertaken on the providing side of technology transfer.

3. Technology risk assessments

51. The design of procedures for technology risk assessments will be another important element of an enabling environment for technology transfer. It cannot be simply assumed that technology transfer is always a positive contribution to national development objectives, socio-economic conditions and the state of the natural environment. An assessment of related risks may therefore be warranted. However, technology risk assessments need to be designed in a way to not unduly hinder the technology transfer.

27/ See for further discussion OECD (2002): *Genetic Inventions, Intellectual Property Rights and Licensing Practices. Evidence and Politics*. OECD, Paris, and The Royal Society (2003): *Keeping science open; the effects of intellectual property rights on the conduct of science*. http://www.royalsoc.ac.uk/files/statfiles/document-221.pdf.

28/ This term was coined by Heller, M. and R. Eisenberg (1998): "Can Patents Deter Innovation? The Anticommons in Biomedical Research". *Science 280*, 698-701

29/ See OECD (2002), *ibid.*

Related procedures should therefore by predictable and speedy, and should seek to minimize administrative burdens put on prospective users and providers.

4. Strengthening national research institutions and networks

52. The strengthening of national research capabilities is another important element of an enabling environment for technology transfer. It is important for a number of reasons. The crucial role of the national research system for identifying transfer opportunities was already explained above. Furthermore, however, national research institutions and networks are often key for providing practical research to adapt imported technologies to local socio-economic conditions. Being located in the importing country, they often have the highest potential to tap valuable information from local stakeholders and technology users.

53. Important activities towards the strengthening of national research systems relate to capacity building and may include the training of personnel at all levels as well as the enhancement of technical and institutional capacity. This aspect will be further explained below. However, in order for the national research system to fulfill the tasks as explained above, a number of legal and policy measures may also be necessary. For instance, it cannot simply be assumed that national research institutions have an immediate interest in identifying the technology needs, including the needs for adaptation, of local and traditional communities. They may not necessarily have the research motivation to address the needs of the poor and to engage in related technology development and scaling up on innovation. Additional measures may then be warranted to provide the incentives to research institutions to engage in decentralized research and to build adequate and effective partnerships and networks through consultative processes.

B. Enabling environments for providing technologies

54. On the side of technology provision, the creation or strengthening of an enabling environment refers to the adaptation of legal, regulatory and policy frameworks across all relevant economic sectors to encourage the transfer of technologies that are relevant under the Convention on Biological Diversity. Importantly, such frameworks may apply to both private-and public-sector players. 30/

55. In particular, several intellectual-property-rights-related mechanisms for the sharing of benefits may provide important avenues for the diffusion of biotechnologies. Examples include joint patents with stakeholders in countries of origin of genetic resources as well as joint research programmes with institutions in such countries. 31/ In this regard, such intellectual property rights-mechanisms would seem to have a large potential to play a significant role in north-south technology transfer. Countries could engage in adapting their legal, regulatory and policy frameworks to encourage the use of such mechanisms.

56. A number of activities could be undertaken to foster the transfer of relevant proprietary technology by private and public institutions alike: 32/

30/ Document UNEP/CBD/SBSTTA/9/7/Add.2 summarizes recent activities by Parties to use technology transfer as a means to share benefits that were included in the thematic reports on technology transfer and cooperation submitted as of 15 June 2003.

31/ See Decision VI/24 A of the Conference of the Parties, paragraph 43 and annex II.

32/ Document UNEP/CBD/SBSTTA/9/7/Add.2 summarizes information on the use of incentive measures and on legislative, financial and policy measures for the transfer of technologies of relevance under the provisions of the Convention that were included in the thematic reports on technology transfer and cooperation as submitted by 15 June 2003.

(a) If appropriate, national patenting guidelines could be adapted, for instance, to apply stricter requirements for an invention to be recognized as being novel, useful or representing and inventive step, and thus discourage the issuance of overly broad patents. 33/ The facilitation of compulsory licenses and the application of competition law could also be envisaged in situations where patents do, on balance, unreasonably affect use of inventions and the related technology transfer; 34/

(b) The tax systems of many countries foresee tax breaks or deferrals for charitable activities. The related legal frameworks could be adapted to provide adequate incentives for private companies to engage in the transfer of relevant technologies and related capacity-building activities;

(c) Several countries have programmes in place to offer subsidized export credits or loan guarantees in order to encourage private companies to engage in high-risk export markets. Guidelines for eligibility for such programmes could be adapted to provide incentives to such companies to engage in technology transfer for the purpose of the Convention on Biological Diversity;

(d) In addition to using financial incentives, governments could also develop programmes to raise awareness in the business community and to encourage private companies to develop or expand relevant activities on a voluntary basis, as a major component of corporate charity and social accountability, by pointing to possible indirect benefits in terms of improved reputation and credibility and subsequently increased customer loyalty and improved community relations.

(e) Guidelines for eligibility for publicly sponsored research grants could also be adapted accordingly. For instance, the support of research that makes use of genetic resources could be made contingent of adequate mechanisms for the sharing of benefits being in place, along the lines given in paragraph 55. Such guidelines could also encourage the broad access to research tools (through free access or non-exclusive licenses) and discourage reach-through provisions. 35/

(f) Private research funds could be encouraged to apply similar guidelines. Again, adequate adaptations of the tax system could be envisaged to provide incentives to private research funds to apply such guidelines.

(g) The funding of relevant public institutions, in particular academic research institutions, could be made contingent on the compliance with such guidelines.

Traditional technologies

57. With respect to traditional technologies and innovations, intellectual property rights, possibly granted under a *sui generis* regime, could provide essential guarantees to local and indigenous communities that their know-how and innovations would not be the subject of unauthorized appropriation. To the extent that these guarantees provide incentives for the disclosure of traditional know-how and innovations, such protection could make traditional know-how and innovations more easily accessible, thus contributing to enhancing south-north technology transfer on fair and equitable terms. On the receiving end, the requirement or encouragement of disclosure of origin of such know-how and innovations,

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33/ For instance, the guidelines of the United States Patent and Trademark Office (USPTO), revised in 2001, specify that utility in the case of genetic inventions has to be *"specific and credible"*. See OECD (2002), ibid, for further discussion.

34/ See The Royal Society (2003), ibid.

35/ See OECD (2002), ibid, for a related discussion of the guidelines of the United States National Institutes of Health (USNIH).

including through the adaptation of national patent laws and/or other means, appears to be an important means to alleviate the enforcement of such intellectual property rights.

VI. CAPACITY-BUILDING

58. The analysis of the second national reports and the thematic reports on technology transfer and cooperation submitted by Parties to the Convention on Biological Diversity seem to indicate that the building of enhancement of capacity for technology transfer is a highly relevant issue especially for developing countries. 36/ In this context, capacity-building or enhancement is the development or improvement of the abilities a nation's people and institutions to understand, absorb, apply and modify, as appropriate, technologies. 37/ Importantly, capacity-building does not only refer to the training of personnel, although such activities are an important element of a comprehensive programme for capacity-building. In addition to this individual level, capacity building often has also to occur on the institutional and on the systemic or societal level. 38/ On the institutional level, capacity-building relates to the organizational performance and functional capabilities as well as on the ability of institutions to adapt to change. On the systemic level, capacity-building relates to the ability of institutions to communicate and interoperate in an effective manner.

59. The building or enhancement of capacity on these levels is an issue of cross-cutting importance. Indeed, related activities may refer to all elements discussed so far, namely, to the identification of technology needs, to the building and strengthening of national or regional technology information systems and to the creation of enabling environments for technology transfer and cooperation.

60. With regard to technology needs assessment, it was explained above that such assessments should also include the identification of capacity building needs to ensure a successful transfer and absorption of technology. The importance of such assessment being inclusive, involving relevant stakeholders as early as possible through consultative processes, was also stressed. This aspect seems to be of particular importance for identification of capacity-building needs. Indeed, it seems to be well known by now that capacity-building should be locally owned and driven in order to be successful. Most effective results are often achieved at local levels by innovative community leaders. 39/

61. However, the building or enhancement of capacity may also be also needed in order to effectively conduct needs assessments at national levels. Related activities could include: the training of government personnel on relevant assessment methodologies and the establishment or strengthening of collaborative partnerships between national authorities, relevant research institutions, the private sector and local and traditional communities, with a view to facilitate communication of technology needs and the identification of priority needs.

62. The building or enhancement of capacity would also be an important element in the development or strengthening of information systems at national and international levels. Related activities would include, *inter alia*, training on the use and adaptation of information technologies, and the support of networking between national or regional centers of excellence in the development and adaptation of

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36/ See document UNEP/CBD/SBSTTA/9/7/Add.2.

37/ See the Chairman's report on the Norway/UN Conference on Technology Transfer and Capacity Building, held in Trondheim, Norway, on 23 – 27 June 2003.

38/ See Remple, Nick: *UNDP/GEF experiences in technology transfer and capacity building in biodiversity.*. Presentation at the Norway/UN Conference on Technology transfer and Capacity Building, held in Trondheim from 23 to 27 June 2003.

39/ See Remple, Nick, ibid.

technology databases and their interoperability. With regard to risk assessments, for instance, activities for capacity-building could include biosafety career awards and professional in-training programmes, as well as the establishment of a professional biosafety career path, including professional training and a certification programme. 40/

63. The building or enhancement of capacity would also contribute to the creation of enabling environments for technology transfer. Related activities would include, for instance, the training of personnel with regard to the adaptation of legal, regulatory and policy frameworks, including the use of appropriate incentive measures that are conducive for the transfer of technologies, and the development or strengthening of institutions such as technology transfer offices.

64. Another important set of activities could focus on national or regional innovation systems. Such activities would aim to strengthen the capacities of national or regional networks of academic, public and private research centers and institutions, regulatory agencies and relevant stakeholders for technology absorption, that is, for the adaptation of imported technology to locals needs and circumstances, and for the use of such technology for further research and development activities. Activities could include the training of personnel with regard to the use of technologies and relevant expertise, but also the establishment of institutions that support the effective transfer of technologies among the actors enumerated above, such as venture funds, incubators, applied research and development centers, and research parks. Furthermore, a general extension of the domestic educational system and an improvement of the quality of education would also contribute to enhance the capacity for technology absorption.

VII. OTHER ASPECTS OF RELEVANCE TO THE PROGRAMME OF WORK: DESIGN AND IMPLEMENTATION SUPPORT MECHANISMS

65. As explained earlier, it is proposed to structure the programme of work on technology transfer and cooperation along the classification of important aspects as used in the previous sections. The implementing activities under each programme element could be spelled out along the following lines:

(a) *Research and analysis.* If appropriate, an in-depth analysis of relevant issues should be undertaken first in order to build consensus on relevant entry points for further policy guidance and action. For instance, the role of intellectual property rights on technology transfer should be studied further in order to identify which policy actions are appropriate both at the providing and the receiving ends of technology transfer. Competent international organizations, in collaboration with the Secretariat, would be the main actors during this stage;

(b) *Development of international policy guidance.* Based on the previously undertaken research and analysis, international guidance could be developed in order to assist Parties, governments and relevant international organizations in the implementation of the programme of work. For instance, with regard to the programme element "needs assessment", such guidance could consist in the development on a manual on methodologies for needs assessment. Again, competent international organizations, in collaboration with the Secretariat, would be the main actors during this stage;

(c) *Development of national strategies and action plans reflecting domestic priorities and circumstances*. The development of national policy strategies and policy action, that is, the

40/ See Kapucinski, Anne: *From reactive to pro-active Biosafety: Science, Technology and Capacity Needs.* Presentation at the Norway/UN Conference on Technology transfer and Capacity Building, held in Trondheim from 23 to 27 June 2003.

development of a comprehensive and consistent set of policy objectives and the design of a set of appropriate policy tools to attain these objectives, would come as the next step. It is suggested that the development of such policy strategies and action plans is used as an operational target under each relevant element of the programme of work. Parties to the Convention on Biological Diversity would be the main actors during this stage;

(d) *Implementation of national strategies and action plans*. The implementation of these policy plans would come as the last step. Again, Parties to the Convention on Biological Diversity would be the main actors during this stage;

66. A number of mechanisms could be envisaged to support implementation of the programme of work at the international level. They could include: the development of a roster of experts on technology transfer and cooperation under the Convention, the establishment of an Ad-hoc Technical Expert Group on Technology Transfer and Cooperation, and the mandating of the Informal Advisory Group of the Clearing House Mechanism to provide advice on international information systems for technology transfer and technology cooperation, and on how to strengthen the Clearing House Mechanism of the Convention in this regard.

67. The establishment of an Ad Hoc Technical Expert Group on Technology Transfer and Cooperation was already envisaged in the proposals of the Executive Secretary for the preparation of the seventh meeting of the Conference of the Parties endorsed as per decision VI/30. 41/ Specifically, in paragraph 60, the note indicated that:

(a) SBSTTA, at its ninth meeting, will also consider establishing an Ad Hoc Technical Expert Group with the following mandate:

(i) Inventory categories of existing technologies, including from local and indigenous communities, for the conservation of biological diversity and sustainable use of its components, in all the thematic areas and cross-cutting issues addressed by the Convention; and assess their potential impacts on biodiversity and their requirements for successful application;

(ii) Compile success stories on technology transfer and cooperation;

(iii) Develop proposals on how to improve the role of the clearing-house mechanism in promoting international technical and scientific cooperation;

(b) The Ad Hoc Technical Expert Group will meet as soon as possible after the ninth meeting of SBSTTA, and will finalize its work in time for the seventh meeting of the Conference of the Parties;

68. The short period between the ninth meeting of SBSTTA and the seventh meeting of the Conference of the Parties could not be anticipated when drafting these proposals. To keep the option of convening the Ad Hoc Technical Expert Group even under this tight timeline, the Executive Secretary sent notification 2003-061 on 4 July 2003, indicating that it is necessary to initiate preparations for the meeting without further delay and inviting Parties and governments to nominate experts on transfer of technology and technology cooperation for participation on the Ad Hoc Technical Expert Group.

69. However, the Executive Secretary also indicated in this notification that such preparatory work is without prejudice to the decision to be made in this regard by SBSTTA at its ninth meeting. In order to ensure that the Ad Hoc Technical Expert Group directly contributes to the implementation of the

41/ See document UNEP/CBD/COP/6/2.

programme of work on technology transfer and cooperation, SBSTTA may wish to postpone the meeting of the group to a date after the seventh meeting of the Conference of the Parties. SBSTTA may also wish to adapt the mandate of this group in order to adequately reflect the needs for technical support emanating from the programme of work as endorsed by SBSTTA. A proposal for the mandate of the group that reflects the draft programme of work is given under programme element 5 in the note by the Executive Secretary on draft elements of a programme of work on technology transfer and cooperation (UNEP/CBD/SBSTTA/9/7/Add.1).

70. It is proposed in particular to relegate the development of proposals to strengthen the clearing-house Mechanism as an international gateway for accessing information on relevant technologies to the Informal Advisory Committee of the Clearing House Mechanism, because of the specific technical issues and expertise necessary to fulfill this task. The Informal Advisory Committee has the mandate as well as the requisite knowledge and technical experience to assist the Executive Secretary in preparing such proposals. 42/

42/ See decision V/14, paragraph 3.