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Программа Организации Объединенных Наций по окружающей среде

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Technology Needs Assessments

Project Executive Summary:

Technology needs assessment (TNA) as a set of country-driven activities that identifies and determines the mitigation and adaptation technology priorities of developing country Parties is central to the work of Parties to the Convention on technology transfer and present an opportunity to track an evolving need for new equipment, techniques, practical knowledge and skills, which are necessary to mitigate GHG emissions and/or reduce the vulnerability of sectors and livelihoods to the adverse impacts of climate change. This project seeks to support 35 to 45 countries with GEF grant financing of US\$ 9 million to carry out improved TNAs involves in-depth analysis and prioritization of technologies, analysis of potential barriers hindering the transfer of prioritized technologies as well as issues related to potential market opportunities at the national level. National Technology Action Plans (TAPs) which will be prepared as sequel to the TNAs will outline essential elements of an enabling framework for technology transfer consisting of market development measures, institutional, regulatory and financial measures, and human and institutional capacity development requirements will include a detailed plan of action to implement the proposed policy measures and estimate the need for external assistance to cover additional implementation costs. Targeted training and supporting materials related to methodology for prioritization of technologies, market assessment, access and links to data on technologies will be developed and tested and distributed within the framework of the project. The project will also help provide feedback to fine tune methodologies and contribute to the revision of the new TNA Handbook through an iterative process involving the national project partners and regional centers of excellence.

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LIST OF ACRONYMS AND ABBREVIATIONS

AIT	Asian Institute of Technology
ATPSN	African Technology Policy Studies Network
CARICOM	Caribbean Community and Common Market
CEERD	Centre for Energy Environment Resource Development
CDM	Clean Development Mechanism
CSIR	Council for Scientific and Industrial Research
COP	Conference of the Parties
DGEF	Division of Global Environment Facility Coordination
DTIE	Division of Technology, Industry and Economics
ENDA	Environmental Development Action in the Third World
ERC	Energy Research Centre
EST	Environmentally Sound Technology
LDC	Least Developed Countries
OLADE	Organización Latinoamericana de Energía
OSS	Sahara and Sahel Observatory
PSC	Project Steering Committee
PMC	Project Management Committee
PIU	Project Implementation Unit
TNA	Technology needs assessment
TAP	Technology Action Plans
TERI	The Energy and Resource Institute
SCCF	Special Climate Change Fund
SBSTA	Subsidiary Body on Scientific Technological Advice
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
URC	UNEP Risoe Centre on Energy, Climate and Sustainable Development

1 Project Overview

Project Information

Table 1: Required Project Information

Identification	GFL: PMS:	
Project Title	Technology Needs Assessments	
Managing Division	Division of GEF Coordination	
Project Manager and Org. Unit	George Manful	Climate Change Unit
Type/Location	FSP [Global/Normative/Enabling Activity]	
Trust Fund:	Special Climate Change Fund	
Strategic objectives: GEF strategic long-term objective Strategic programme for GEF IV	Climate Change Enabling Activity Special Climate Change Fund – Technology Transfer	
Project executing organization	DTIE WITH UNEP RISOE CENTRE (URC), REGIONAL CENTERS, NATIONAL PARTNERS	

Duration and Cost

Duration

Project Commencing: November 2009	Project Completing: April 2012	Total duration in Months: 30
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Cost of project	US\$	%
Cost to the GEF Trust Fund	8,181,818	74
<i>Co-financing</i>		
Cash		
Contribution from TMA-Norway	705,000	6.5
<i>Sub-total</i>	<i>705,000</i>	
In-kind		
Contribution from countries	2,000,000	18
Contribution from UNEP/RISOE	150,000	1.5
<i>Sub-total</i>	<i>2,150,000</i>	
Total	11,036,818	100

2 Project Justification

The UNFCCC process defines technology needs assessment (TNA) as a set of country-driven activities that identify and determine the mitigation and adaptation technology priorities of developing country Parties. The purpose of TNA is therefore to assist developing country Parties to the UNFCCC identify and analyse priority technology needs, which can form the basis for a portfolio of environmentally sound technology (EST) projects and programmes to facilitate the transfer of, and access to, the ESTs and know-how in the implementation of Article 4.5 of the Convention. Hence TNAs are central to the work of Parties to the Convention on technology transfer and present an opportunity to track an evolving need for new equipment, techniques, practical knowledge and skills, which are necessary to mitigate GHG emissions and/or reduce the vulnerability of sectors and livelihoods to the adverse impacts of climate change.

Since 2001 developing country Parties to the UNFCCC have been assessing their technology needs in the areas of climate change mitigation and adaptation within the framework of their national development plans and strategies. Through its interim financing for capacity-building in priority areas – enabling activities phase II (also known as “top-ups”) – the Global Environment Facility (GEF) provided funding to 94 eligible countries to enable them to conduct TNAs. Parties made available information on the results of their needs assessments either as separate documents or as part of their national communications.

In December 2007, COP 13 requested the GEF, in consultation with interested Parties, international financial institutions, other relevant multilateral institutions and representatives of the private financial community, to elaborate a strategic programme to scale up the level of investment for technology transfer to help developing countries address their needs for environmentally sound technologies. In response to this guidance, the LDC/SCCF Council approved in November 2008 its strategy presented in the document: “Elaboration of a Strategic program to scale up the level of Investment in the Transfer of Environmentally Sound Technologies”. This strategy paper which was submitted to COP 14 in December 2008, was overwhelmingly endorsed by Parties and renamed Poznan Strategic Program to scale up the level of Investment in the Transfer of Environmentally Sound Technologies. To help implement this strategy, the LDC/SCCF Council approved a grant funding of \$50 million using existing GEF-4 resources and the SCCF Program on Technology Transfer. The Strategic Program on Technology Transfer consists of three windows: (1) technology needs assessments; (2) piloting priority technology projects; and (3) dissemination of successfully demonstrated technologies.

This project deriving from window (1) of the Strategic Program on Technology Transfer is designed to support 35 to 45 countries, to carry out improved Technology Needs Assessments within the framework of the UNFCCC. The assessments will involve amongst others in-depth analysis and prioritization of technologies, analysis of potential barriers hindering the transfer of prioritized technologies as well as issues related to potential market opportunities at the national level. National Technology Action Plans (TAPs) agreed by all stakeholders at the country level will be prepared consistent with both the domestic and global objectives. These plans outlining essential elements of an enabling framework for technology transfer consisting of market

development measures, institutional, regulatory and financial measures, and human and institutional capacity development requirements will also include a detailed plan of action to implement the proposed policy measures and estimate the need for external assistance to cover additional implementation costs. Targeted training and supporting materials related to methodology for prioritization of technologies, market assessment, access and links to data on technologies will be developed and tested and distributed to all eligible countries. Experiences gained in implementing the project will be shared amongst participating countries to enhance cross country learning. The project will also help provide feedback to fine tune methodologies and contribute to the revision of the new TNA Handbook through an iterative process involving the national project partners and regional centers of excellence.

Baseline situation analysis

Information contained in the first TNA reports and initial national communications already submitted to the UNFCCC by developing countries revealed that these are currently undertaking activities particularly in the energy, transport, forestry and agricultural sectors which not only advance the achievement of their national development priorities but also lead to emissions of greenhouse gases responsible for causing global warming. The reports also indicate that important socio-economic sectors such as agriculture, water resources, terrestrial ecosystems including forestry, coastal and marine resources as well as human health are extremely vulnerable to the adverse impacts of climate change and are already experiencing significant multiple stresses from current climate variability. These impacts are likely to be exacerbated by future climate change, a factor which makes their economies as well as their infrastructure highly vulnerable.

Technology needs assessments carried out in 70 countries and report submitted to the UNFCCC indicate that both mitigation and adaptation technologies are required by developing countries to address the challenges of climate change. Information contained in the second synthesis report on technology needs identified by Parties not included in Annex I to the Convention (FCCC/SBSTA/2009/INF.1) submitted to SBSTA 30 in June 2009 reveal that national circumstances were the key factors influencing the choice of sectors selected for the conduct of TNAs, while the criteria for the selection of technologies were influenced mainly by development-related concerns. Energy generation and use, transport, agriculture and forestry were the most commonly selected sectors for which technology needs were identified for the mitigation of GHG emissions. Agriculture and forestry, water management, and systematic observation and monitoring were the most commonly considered sectors in relation to technology needs for adaptation. The methods used to prioritize technology needs included multi-criteria analysis, the analytical hierarchy process, cost–benefit and risk–benefit analyses, use of optimization models, and questionnaire surveys, interviews and workshops with stakeholders. Although the roles of the stakeholders were often not clearly identified in the reports, they were involved mostly in setting the selection criteria for the technology needs, in selecting key sectors and in conducting the initial review. They were however infrequently involved in identifying next steps and in prioritizing the technology needs.

The synthesis report further revealed that in the energy sector, the most commonly identified technology needs for mitigation related to solar photovoltaic technology (grid connected and off-grid); biomass (forest residues and communal biowaste processing via biodigesters); large, small

and micro-hydropower plants; efficient lighting and water heating (solar and biomass); water pumping (solar and wind); efficient fuel-conserving stoves and ovens (solar, charcoal and biomass); and solar drying of agricultural products. Sectors identified as priority sectors for adaptation were agriculture and forestry, water, and coastal zones. In the agriculture sector, the most commonly identified technology needs for adaptation were related to crop management, efficient use of water and improving irrigation systems (micro-irrigation, creating networks of reservoirs and water resource management). With regard to forestry, technology needs included early warning systems for forest fires and technologies for afforestation and reforestation. In terms of coastal zones, hard and soft technologies were identified as needed to protect against and accommodate sea-level rise.

Significant constraints were encountered by countries during the preparation of the first round of TNAs which did compromise on the quality, comprehensiveness and utility of these reports. Existing in-country capacity has been identified as being insufficient to address the transfer of ESTs. In many countries access to information and awareness-raising, human, institutional and organizational capacity were identified as major impediments to the TNA process; implementation of policies and programmes; implementation and enforcement of appropriate regulations; and economic, market and infrastructure capacity. The synthesis report further indicated that capacity-building needs were sector specific they ranged from the need for skilled human labour to the need for institutional capacities to build efficient policies and a legal and regulatory environment. Most of the Parties identified a lack of clear governmental strategies for the implementation of the results of the TNAs.

Despite the weaknesses identified with the preparation of the first round of TNA reports, the reports nevertheless have served as an effective tool for national decision makers and other actors involved in the technology transfer process, not only to identify specific technology needs, but also point out the direction in which future policies and regulations will need to progress.

In this regard, the recently updated UNDP TNA handbook together with the three tools being developed within the framework of this project, viz., TNAssess, TechWiki and TNA Report Formulation Aid tool will greatly enhance the quality of the new TNA reports produced within the framework of this project. TNAssess is an interactive tool for technology prioritization for a country at the sectoral / sub sectoral level based on multi criteria decision analysis methodology. It will be used to facilitate a transparent, consultative, and user friendly interaction amongst stakeholders for prioritizing technologies both for adaptation and mitigation. TNAssess will require TechWiki, an online database of technological options required for mitigation and adaptation. Finally for recording the outputs from the TNA exercise in a standardized fashion. A digital tool- “TNA Report Formulation Aid Tool” is being developed. These tools are however still under development and UNEP will complement the efforts of UNDP and others in this direction. For the Terms of Reference for international consultancy assignments (see **annex A**)

UNEP’s comparative advantages, linkages to other initiatives

See REQUEST FOR CEO ENDORSEMENT/APPROVAL DOCUMENT - section G of Part II

3 Project Statement & Approach

Project Statement

As part of the GEF Strategic Programme on Technology Transfer, the project will provide targeted financial and technical support that assists developing countries in carrying out improved Technology Needs Assessments (TNA) within the framework of Article 4.5 of the UNFCCC. The intention is that assisted countries go beyond identifying technology needs narrowly and develop national technology action plans for prioritized technologies that reduce greenhouse gas emissions, support adaptation to climate change, and are consistent with national development objectives.

Project Approach

The present project has been designed to respond to Parties concern and demand and address the above mentioned barriers. The ultimate goal of the project is to provide the framework conditions, and adequate support, in order for GEF beneficiary countries to produce a grounded and useful TNA, with associated TAP fostering technology transfer in the adaptation and in the mitigation spheres. The new TNA Handbook (as revised by UNDP and UNEP) will guide the project development in terms of methodology and provide a general framework to countries conducting their TNAs. The project will also identify hurdles in using the revised TNA handbook and complement this tool with all needed methodological developments. To secure success and cost effectiveness, a sequential, approach will be followed, in which 15 countries will be initially selected. More countries will be gradually added when some experience has been accumulated and capacities have been created at regional level. It is also expected that tools and methodologies well tested will then help to scale the process up, hopefully before the end of the first year.

Global Focus

This global project which will covers 35-45 countries from Africa, Asia and the Pacific and Latin America and the Caribbean Selection of countries will take into consideration elements including size of the country / economy, mitigation potential, adaptation needs, national interest and enabling environment, expression of interest by countries, past efforts, institutional capacities, etc. Initial countries will be chosen with a goal of regional diversity; Ghana, Senegal, Uganda, Argentina, Bahamas, Thailand, Cambodia will likely be part of the first set of countries to field test the revised TNA Handbook. In any case the selection of countries will involve a consultative approach, demonstrated interest from targeted countries and approval from the Project Steering Committee (PSC). Final list of participating countries will meet the following criteria:

- **Regional balance:** With respect to representation from Africa, Asia and America, and at the same time ensuring adequate representation of vulnerable Islands.
- **Country size:** Considering that large developing countries already have reasonable access to technologies in the international market, are already active participants in the CDM

market, and may also get facilitation through sector approaches, the focus will be on medium-size and small countries.

- Balance between Mitigation and Adaptation: The TNA cover technology needs for both mitigation and adaptation and therefore the overall group of countries should provide a good balance between mitigation and adaptation needs.
- Interest shown by the countries and suggestions received from the various organisations, including from UNDP, UNFCCC, GEF, UNEP etc.
- For the first list of 15 countries, past record, familiarity and good experiences will also be important to ensure that good results can be obtained in the short time frame. It will secure carrying out TNA process successfully to other countries in the second round and after.

Project architecture

The project which has three principal components have a list of project activities outlined in the work plan (See REQUEST FOR CEO ENDORSEMENT/ APPROVAL DOCUMENT; Annex D).

The sequence of project activities includes:

- i. Preparatory work towards the establishment of project management framework, organization of Project Inception Workshop, and preparatory work at country level (including the formation of TNA National teams, appointment of national project managers etc.) in consultation with global project team.
- ii. Development / adaptation of tools and training material
- iii. Organization of capacity building workshops at the regional levels
- iv. Preparation and elaboration of TNAs in countries with support from project consultants.
- v. Mid term regional workshops and country workshops for sharing experiences and getting feedback from a wide range of stakeholders
- vi. Preparation of Guidebooks providing further details and examples of applied methodology as considered useful to reinforce or adapt the revised TNA handbook to country situation
- vii. Coordinating support for TAPs preparation and elaboration in countries
- viii. Dissemination and sharing experiences- website, workshops, reports, newsletter, and network etc

Note: For the additional countries, all steps, except (ii) and (vi) are followed, but capacity building workshops and support is provided by regional centers, who were involved in the first round (and hence developed capacity to support the TNA work, using the guidebooks and training material developed during the first round.

Component 1 Support for the development or strengthening of TNAs in 35-45 countries

National stakeholders will identify technologies needed at the country level with support from the project team. This will be done through provision of methodological tools (Component 2) and capacity building at regional level and in countries. Stakeholder consultations will form the basis to reach a consensus on technologies prioritized within sectors using approach given in revised TNA handbook however this may have to be complemented by other methodologies which provide information on costs and investment

requirements. Identification and analyses of barriers hampering technology transfer will be conducted with a view to create an enabling framework for transfer of selected technologies. The countries will be supported in barrier identification and analysis through guidebooks (Component 2), and regional and local consultants. The methodology for identifying technology given in revised TNA handbook and enabling framework for transfer of technologies will be adapted to country conditions and modified based on the feedback and experience in the first fifteen countries.

The support for next round of countries will get much more coordinated by the regional centers who will now use the tested revised TNA handbook for technology identification and guidebooks for barrier identification and analysis. The production and communication of TNAs and TAPs to the UNFCCC will take place towards project end while outputs from components 2 and 3 will provide necessary capacity and inputs to ensure that these documents are high quality and implementable.

A continued process of consultations and analyses, lead by the national TNA team will gradually lead to elaboration of a TAP, with practical and implementable steps towards reduction and elimination of barriers for clean technologies. The development of a TAP will be conducted through a process oriented approach, which will actively involve various stakeholders in the formulation of policy elements.

This TNA/TAP process will involve at an early stage as far as possible:

- Stakeholder meetings and consultations,
- Workshops with financial institutions, private sector entrepreneurs, government, academics and researchers
- Providing platform for bringing together technology providers and users.

The TAP will systematically address practical actions necessary to reduce or remove policy barriers, finance related barriers and technology specific barriers. The plan will also address necessary actions in terms of solving interactions between various barriers and address the necessary timing. While the TAP is developed by the national TNA team within the current programme, it should be recognized that adoption of the action plan by government lies outside the programme. It is therefore important to ensure a consultative political process throughout the development of the TNA in order to enhance the chances of later adoption by government, and consequently it is envisaged that elaboration of TNAs and TAPs will take up to two years.

Component 1 has the following outputs:

1. A network of participating individuals and institutions at national level informed and bringing capacity to secure national consultations in order to reach a national consensus on adequate technologies Identification and creation of stakeholders groups will be based on recommendations contained in the draft TNA handbook.
2. A synthesis of methodological applications and hurdles carried out at national level and serving as input for TNA elaboration
3. Between 35 and 45 TNAs including TAPs produced, identifying barriers to technology transfer at national level and means and actions to overcome them.
4. Feedback for TNA handbook update based on national experiences and processes.

All methodological materials will be made available on UNEP website in the English language while TNAs and TAPs will be made available in any of the six UN languages of the participating countries hard copies of all reports and materials will be made available to participants during workshops. While formal

reporting to the Convention will remain responsibility of the countries, the EA will keep the IA informed of progress and content of the TNAs and TAPs. The IA will keep the GEF informed of progress of project implementation.

Outcome: National consensus on priority technologies and agreement on a national action plan, institutional provision and capacity built for implementation and action plan update.

Component 2 Development of tools and provision of methodology information to support TNA and TAP processes

A simplified common approach to TNA will be developed based on the latest TNA handbook for training, capacity building and implementation purposes. The revised TNA Handbook has been developed by UNDP in consultation with UNEP, UNFCCC secretariat and EGTT. As a part of the guidebook, three tools are also being developed, viz., TNAssess, TechWiki and TNA Report Formulation Aid tool. TNAssess is an interactive tool for technology prioritization for a country at the sectoral / sub sectoral level based on multi criteria decision analysis methodology. It is to be used to facilitate a transparent, consultative, and user friendly interaction amongst stakeholders for prioritizing technologies both for adaptation and mitigation. TNAssess will require TechWiki, an online database of technological options required for mitigation and adaptation. Finally for recording the outputs from the TNA exercise in a standardized fashion a digital tool- “TNA Report Formulation Aid Tool” is being developed. These tools are however still under development and UNEP will complement the efforts of UNDP and others in this direction.

The revised TNA Handbook provides a basis for prioritizing technologies within sectors. It may also be important for countries to understand how to do an overall prioritization across sectors. Countries will also need detailed methodologies for analysis of technologies including economic analysis, estimation of marginal abatement costs, market assessment, barriers analysis and enabling framework creation. Enabling framework in turn may require methodology / guidance on how to analyze and address legal issues, access finance and so on. The TNA Handbook will be supplemented by developing required detailed methodologies and guidebooks for these areas.

Access to data on technologies will be needed by the countries. TNA handbook refers to TechWiki for this purpose. However, given that this is still under development UNEP would complement efforts in this direction by providing either data or links and access to data bases. This would also entail paying up for some data bases. While the databank on technologies for climate change mitigation options can be based on dynamic extraction from other existing databases, the wide range and the low level of standardization and variable performances for adaptation technologies pose a specific challenge. To address this challenge, the project team will draw on a team of experts within UNEP Risoe Centre and outside. Hence the project will need to invest upfront to access this information.

This component has the following output:

1. A tool to prioritize mitigation options based on cost effectiveness, existing potential, resource availability and relevance for national situations developed and presented.
2. A tool to prioritize adaptation technological options based on climate change impacts as well as human, economic, social and costs related aspects developed and presented.
3. A simple and efficient market assessment tool made available
4. A process to apply the tools at national level agreed upon.

5. Access and links to information database elaborated and serving as a base for technology specification in terms of performance, cost and availability.
6. Reporting template for TNA elaborated.

These tools will allow each country to focus on the identification, adaptation and development of technologies best suited to their national priorities. Results of work will be presented and further elaborated during specialized working groups involving national representatives from supported countries.

Outcome: Methodologies which complement the revised TNA Handbook and facilitate technology information available to countries.
Capacity developed through workshops and guidebooks, Access to data. Regional networks ensure that critical technology information is available and a cooperation mechanisms to share TNA experiences is in place.

Component 3 Establishment of a cooperation mechanism that aids preparation and refinement of TNAs and TAPs implementation and dissemination

The challenge-and value added- of the present initiative is to prompt synergies and to enhance cost effectiveness for implementation of TNAs. It requires initial investment to build mechanisms securing North South and South South coordination and technology transfer in the end. The TNAs and TAPs, once synthesized will provide a world-wide vision of the most urgent and impactful technologies needed by GEF beneficiary countries to address urgent challenges with respect to mitigation and adaptation. In order for this synthesis to be of relevance and trigger action, there is a strong need to invest in coordination, exchange of experience, coherence tool building, etc.

Because of the very nature of technology transfer, national networks are insufficient and need to be reinforced by a range of regional and international institutions specialized in technology transfer. National networks need to establish links with their neighbor counterparts and sometimes links with national institutions in other parts of the world. Technology Transfer from say Asia to Africa can be extremely meaningful for some specific technologies. The project will put in place the mechanisms for this cross fertilization to take place. As far as TNAs and TAPs processes are concerned, some countries will be more successful than others and it is important to identify key factors for success, indicate useful path and disseminate these experiences to other countries.

To address these needs, regional centers of excellence will be identified in each region to promote cooperation, build capacities in countries and region, share knowledge and experiences, and facilitate dissemination (see part III for details). A number of the project activities; viz., capacity building including training and dissemination will be carried out through the regional centers. A network of participant countries, organizations, knowledge centres and other interested stakeholders will also be created to foster cooperation and dissemination.

Dissemination will also be carried out through a number of cross exchange regional workshops (1- 2 in each region) for the benefit of stakeholders in the region. The workshops will also serve as a forum for exchange of views and sharing of knowledge, and building networks at regional level. An international workshop to disseminate and share views with stakeholders at large will also be conducted at the end of the project. The workshop will also serve as forum to disseminate the lessons learnt and synthesis report

from the project. Other dissemination activities will be through the project website, newsletter, and presentations / publications in various fora, as and when an opportunity arises.

As the present project plans to support 35 to 45 countries, an important outcome of the project is to secure replicability. Hence it will be ensured that information from the project is readily available to other non participating countries, and they also have access to developed tools and a clear roadmap for replication.

A newsletter will be elaborated and sent to all GEF beneficiary countries. The newsletter will inform about progress of the projects and provide contacts at regional and international level.

An international workshop will take place at project end involving key partner countries in the project with opportunity for representatives from countries supported by and outside this initiative to attend and benefit from the successful experiences.

Support on request will be provided by the project team (UNEP, URC, Regional partners, and internationally recruited consultants), during project implementation and a separate mechanism for continued support after finalizing the TAPs will be proposed, although outside the scope of the present initiative.

Outputs

1. A Network involving both national and supra national institutions recognized for their success in technology transfer activities established and operational
2. Proven approaches to elaborate good quality TNAs developed. Institutional responsibilities set up. Capacities built to elaborate, implement and revise TNAs and associated TAPs.
3. Replication approach available to all GEF beneficiary countries together with a proposed mechanism for interactive support.
4. A “Best Practices and Lessons Learnt report” from the project produced and disseminated.
5. Synthesis report from the project produced and disseminated.

Outcome: Increased national and interregional cooperation on technology transfer as a mean to facilitate preparation of TNAs and implementation of TAPs

Stakeholder Analysis

The global Technology Needs Assessment project involves a wide range of stakeholders both at the national level in the 30 to 45 countries supported and those within partner institutions including regional centres of excellence. In eligible countries, national teams involving all relevant institutions and agencies as well as experts according to national circumstances would be at the core of the project. Most probably, Ministries of Environment and Natural Resources, Energy, Planning, Technologies as well as research centres linked to Climate Change Mitigation and Adaptation, Ministry will be involved. Private firms importing and or production mitigation and or adaptation technologies will be associated. So will potential financiers in-country.

Critical to the successful implementation of this project is UNEP DGEF, as the GEF Implementing Agency of the project who will place at the disposal of this initiative its extensive experience in supporting climate change enabling activities including the preparation of TNAs.

UNEP DTIE and the UNEP Risoe Centre on Energy, Climate and Sustainable Development involved in coordinating efforts, providing methodological guidance and technical expertise to the countries on the themes related to technology needs assessments and associated Technology Action plans. They would also make available to the project their extensive experience in technology transfer related activities and networks, financial support and cooperation with private partners, both from industry and from the same finance sector.

At regional level it is envisaged that at least 4 regional centres will be involved in the exercises, first as recipient of training and information, and at a later stage in the project, in providing support directly to the countries. These regional centre are well recognized institutions such Technology (AIT), Centre for Energy Environment Resource Development (CEERD, Bangkok), The Energy & Resource Institute (TERI), PELANGI (Indonesia), Energy Research Centre (ERC, South Africa), CSIR (South Africa), ENDA (Senegal), African Technology Policy Studies Network (ATPSN), Sahara and Sahel Observatory (OSS), SouthSouthNorth, Fundación Bariloche, CARICOM, OLADE (Ecuador) . They will in fact benefit from the present initiative in terms of capacity building in the regions and regional analysis and action. For a global initiative of this kind which envisions a wide range of stakeholders, an exact list of possible stakeholders in up to 45 countries at this stage is premature to establish in a meaningful manner.

The impact of the present project on civil society, or gender is limited during project execution while indirect impacts, which could be provided by effective technology transfer, can be substantial. The classical example is the replacement of fuel wood, usually gathered by women, by modern energy. Studies demonstrate that the time dedicated by women to cooking and household tasks can be divided by 5 through introduction of modern energy, hence leaving time for self education, productive activity and children education.

Technologies related to agriculture, transport and consumer goods, do have a close inter relation with civil society and their introduction will both need association of civil society and could modify the way in which certain sectors are governed.

However, the present project is focussed on reporting to the UNFCCC on technology needs, and identifying barriers as well as remedial actions, which would allow technology transfer to take place. Hence, while the capacity building elements is very strong and focussed on producing high quality TNAs involving all relevant stakholders at national levels as well as provide the roadmap for technology adoption, , implications on gender on one hand and civil society on the other will be seen when implementing the identified measures.

Partnership Analysis

As other GEF initiatives, the present GEF project on Technology Needs Assessment is primarily a partnership. External partners can be classified in two categories at this stage. However, slippage from category 2 to 1 can occur at some stage on spontaneous basis.

The first category is made of regional centres of excellence. Those centres, located in-region, will first be recipient of knowledge and will be chosen to develop their internal capacity on the specific topic of Technology Transfer, Technology Needs Assessments, and Technology Action

Plans. The identified centres are as follows: Asian Institute of Technology (AIT), Centre for Energy Environment Resource Development (CEERD, Bangkok), The Energy & Resource Institute (TERI), PELANGI (Indonesia), Energy Research Centre (ERC, South Africa), CSIR (South Africa), ENDA (Senegal), African Technology Policy Studies Network, OSS SouthSouthNorth, Fundación Bariloche, CARICOM, OLADE (Ecuador) and others. UNEP Risoe Centre has a long term working relationship, through other projects, such as the capacity building project for CDM (CD4CDM), which has been executed in 19 countries. Regional experts will be trained through training workshops, where common understanding of approach and methodologies will be achieved

In a second phase of the project, these centres will become full fledged partners of the TNA project and will provide support to countries carrying out their TNA and seek advice as and when required from UNEP DTIE and the UNEP Risoe Centre on Energy, Climate and Sustainable Development. Their specific theme complement those of the core partners of UNEP GEF, UNEP DTIE and UNEP Risoe: These centres have a solid reputation in region and usually work with a network of experts in national institutions both on mitigation and adaptation. In most instances they operate an observatory and data collection and analysis role at regional level. Staffed with highly trained expertise, usually both from the region itself and from abroad, they offer the sustainability a GEF project is looking for from an institutional viewpoint.

The second category comprises leading institutions in up to 45 countries supported by the present project for carrying out their national Technology Needs Assessment together with Technology Action Plans. They are recipient of information and methodologies, the project aims at building their internal capacity and they are key to project success insofar as they are ultimately leading the process resulting in the production of high quality TNAs. The project takes 15 countries to pilot the exercise. It is very desirable that these 15 countries, or at least a portion of them, would share their experience and support their neighbour countries in carrying out their own TNAs. A clear objective of the project is to create networks which allow sharing of experience and lessons.

Socio Economic contribution including Gender and Poverty Alleviation

In addition to broadly recognized importance of technology transfer and adoption for climate change mitigation and adaptation, the impact of walking the technology paths for economies in development is also acknowledged as a crucial element for economic and social development. The concrete impacts of the present initiative are two folds:

As direct impact of the project, better coordination in country amongst institutions related to technology transfer and adoption, increased awareness of the opportunities and associated benefits of technology adoption by decision makers and increased local capacity to assess adequate, priority technologies according to country needs, identify barriers to their adoption and recommend action are directly related to project activities.

Another important aspect is increased insertion into regional context with relation building with regional type institutions of a wider range of national institutions and experts, and also, development of networks with neighbouring countries.

If the process is successful, which ideally should not be the case for 100% of supported countries, but which will certainly be the case for a fair proportion, actual transfer and adoption of technologies does yield local benefits which can be classified under very broad categories, all in line with UNEP broad principles and climate change strategy.

The broad range of technologies subject to the present project and their selection by countries does not allow to categorize precisely indirect benefits linked to the present initiative. The following presents a broad vision of what the benefits will be by category.

- Technology adoption will increase productivity and can for some technologies decrease the work load of women.
- Adaptation of technologies will require local inputs, and hence yield local economic benefits in terms of capacity building on one hand and employment on the other. Technology deployment will yield economic and financial benefits.
- Technologies related to agriculture might reduce the risk related to food shortage and hence increase health of concerned populations.
- Entire sectors such as tourism, concerned with coastal risks, will benefit from reduced climate risk and warning and management system as well as planning exercises informing private decision making. In certain areas or for certain countries such as SIDS, tourism represents a sizeable proportion of local income: Up to 80%.

The quantitative analysis of impact of the present initiative would require a specific study which is beyond the scope of the present project both in terms of budget and in terms of horizon.

Crucial success factors

The prerequisite that must be met for project success are closely linked to sustained interest in technology transfer at national level by national decision instances. Any major disruption, whether social, economic, health or food related, will understandably, transfer attention and effort to the immediate urgent matters at hand. There is however no mitigation strategy vis a vis such risks.

At this stage there is no specific provision for social safeguards or environmental trade-offs. However, in executing this project, UNEP will strive to bring attention rise awareness on themes related to environmental impacts and assessments, social/indigenous population involvement when planning technology adoption and Gender related issues.

Logical Framework

See REQUEST FOR CEO ENDORSEMENT/APPROVAL DOCUMENT; ANNEX A: Project results framework

Risk Analysis

See REQUEST FOR CEO ENDORSEMENT/APPROVAL DOCUMENT

(i) Part II - PROJECT JUSTIFICATION, section E (Indicate risks, including climate change risks that might prevent the project objective from being achieved and if possible including risk mitigation measures that will be taken)

(ii) Annex A - PROJECT RESULTS FRAMEWORK : Column 6

4 Reporting & Evaluation

Progress & Financial Report

M&E PLAN

See REQUEST FOR CEO ENDORSEMENT/APPROVAL DOCUMENT - section G of Part I

5 Project Budget

See REQUEST FOR CEO ENDORSEMENT/APPROVAL DOCUMENT - APPENDIX 1 - RECONCILIATION BETWEEN GEF ACTIVITY BASED BUDGET AND UNEP BUDGET LINE (GEF FUNDS ONLY US\$)

Project Organizational Chart

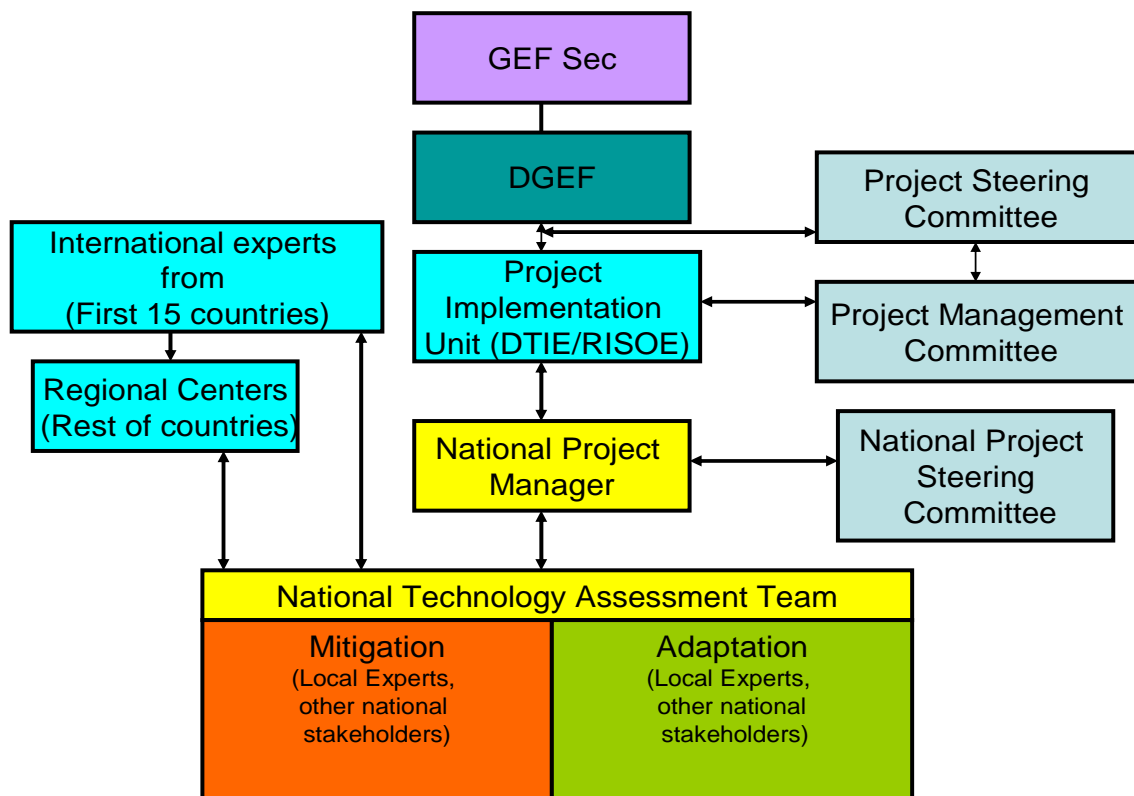


Fig. 1 Project Organizational chart

Project Management

A Project Steering Committee (PSC) is composed of a member of the GEF Secretariat, a member of the EGTT a member of the UNFCCC TT Clear, UNEP, UNDP, the World Bank and UNIDO. UNEP Risoe Centre represented by the project manager will also participate without right to vote. The PSC chaired by UNEP will provide strategic guidance on issues such as country selection and technology orientation coordination with relevant initiatives of other agencies and with the other components of the Poznan Strategic Program on Technology Transfer referred to it by the Project Management Committee. The Project Implementation Unit (PIU) which will serve as the secretariat of the PSC, will provide to the PSC annual overview of progress of project implementation. The PSC will provide guidance to the PIU based on information given to it. The PSC will be involved in selection of countries based on the advice of the PMC and the criteria set out in the project document. The PSC will meet once a year and can be called as needs via teleconference. The project will cover costs of PSC attendance of country representatives.

Project Management Committee (PMC) composed of UNEP/DGEF, UNEP/DTIE and UNEP Risoe Centre would work to provide project management and implementation guidance consistent with their respective roles of the Implementing and Executing Agency of the project. The PMC will be responsible for oversight of project management and delivery of the coming years work. To provide oversight the PMC will need to receive and assess feedback from the countries on quality of support received from the international experts and regional centers and quality of the TNAs and TAPs produced by national teams. The PIU will organize independent questionnaires for completion by country teams on their needs and observation for support; as well as the result of the TNA and TAP quality reviews, and ensure that these are fed directly back to the PMC. The PMC will meet first with PIU to review project progress and plans. Based on results of questionnaires, quality of review and other information, the PMC will agree on the coming years workplan and budget. The PMC will also advise the PSC on country selection.

UNEP/DGEF shall in its role as GEF Implementing Agency, provide project oversight to ensure that GEF policies and criteria are adhered to and that the project meets its objectives and achieves expected outcomes in an efficient and effective manner. Project supervision is entrusted to the Director of DGEF who discharges this responsibility through the assigned Task Manager who represents the Director of DGEF on the project steering committee. Project supervision missions by the Task Manager and/or Fund Management Officer shall constitute part of the project supervision plan. UNEP/DGEF would perform the liaison function between UNEP and the GEF Secretariat and report on the progress against milestones outlined in the CEO approval letter to the GEF Secretariat. UNEP/DGEF shall inform the GEF Secretariat whenever there is a potentially substantive co-financing change (i.e. one affecting the project objectives, the underlying concept, scale, scope, strategic priority, conformity with GEF criteria, likelihood of project success, or outcome of the project). It shall rate, on an annual basis, progress in meeting project objectives, project implementation progress, risk, and quality of project monitoring and evaluation, and report to the GEF Secretariat through the Project Implementation Review (PIR) report prepared by UNEP/RISOE. UNEP/DTIE will ensure, UNEP/RISOE liaises with all countries in the project in preparing and rating the annual PIR. DGEF will also ensure that the Evaluation and Oversight Unit of UNEP arranges for an independent terminal evaluation and submits its report to the GEF Evaluation Office.

UNEP/DTIE shall take responsibility for the execution of the project in accordance with the objectives, activities and budget and deliver the outputs and demonstrate its best efforts in achieving the project outcomes. It shall also address and rectify any issues raised by DGEF with respect to project execution in a timely manner. It shall also support the project mid-term review as an adaptive management tool and develop a management response to the review. UNEP/DTIE shall collaborate with the project terminal evaluation, and provide all information requested by the evaluation team. For a multi-country project such as the global TNA project, it shall inform UNEP/DGEF in the event that one or more countries withdraw from the project. DGEF shall in turn notify the GEF Secretariat.

The URC is the main UNEP partner and shall together with the UNEP DTIE constitute the Project Implementation Unit (PIU). It hosts the Project Team, provides high level technical inputs

and organizes the tasks at global level as well as securing capacity building of regional and national bodies. The project team also serves as secretariat to the PMC and PSC.

Regional Centers are recipient of project training to builds their capacity during the first half of the project to become providers of support to national teams on an increasing basis. The project provides financial support to regional centers to fulfill this aim. The country teams are carrying out TNAs and TAPs at national level and to this end, receive technical support from the global and later regional project teams. Financial support is provided to the country teams by the project.

ANNEX A

TERMS OF REFERENCE

TECHNOLOGY NEEDS ASSESSMENTS

THE FOLLOWING TERMS OF REFERENCE HAVE BEEN ELABORATED BASED ON THE CURRENT KNOWLEDGE OF GAPS IN THE TNA PROCESS INCLUDING TAP ELABORATION. THEY WILL BE FINE TUNED BY THE PROJECT IMPLEMENTATION UNIT. GIVEN THE SCOPE OF THE PRESENT PROJECT AND THE NEED TO MAXIMUM COST EFFECTIVENESS, TASKS DESCRIBED BELOW MIGHT BE CARRIED OUT BY MORE THAN ONE CONSULTANT.

1. Methodology (including market assessment, economic analysis, multi criteria tool etc.)

The objective of the assignment is to provide clear guidance on the methodology which can be applied at national level to prioritize technologies presenting the maximum benefits both from the global (mitigation) and the national (economic social, environment) perspective and assess markets for technologies. While the methodology is broadly described in the TNA handbook, several components needs to be elaborated and translated in such a way that it can be applied by national teams in a relatively simple manner. Some tools such as TNAssess (a technology prioritization tool, that uses multi criteria analysis (MCA) mentioned in the TNA handbook, is yet not available, and hence a tool for multi criteria analysis will need to be developed to prioritize technologies. Country teams will also need to be supported during application of the methodology

The task of the consultant will be as follows:

- Assess the tools that already exist, including for multi criteria analysis for technology prioritization, market assessment of technologies, and economic analysis of technologies.
- Develop the required tools and provide user friendly versions of the tools allowing national counterparts to obtain meaningful results with simple steps.
- Field test the approach (tools) with a minimum of 3 country teams and fine tune the tools.
- Work in close cooperation and train counterparts in at least 3 regional centres of excellence in Asia, Africa and America.
- Train and support regional counterparts and national teams of 15 countries in gaining capacity to apply the tools.
- Work in close collaboration with the mitigation and adaptation experts to synthesize their input in the tools produced.
- Participate in training workshops

The consultant will produce the required methodological tools, ready to use, and including written material, and a report on field tests carried out. The consultant will also prepare guidelines for preparing the training materials and for future use by the regional centres.

Minimum qualification

The candidate will have a university degree in economics, or related discipline
In depth knowledge of energy system modelling tools and decision making techniques.
Knowledge of market assessment computer based tools
Proficiency in English

At least 15 years of experience in the public or the private sector in methodological / analytical work or related activities.

Candidates from GEF beneficiary countries will be considered favourably.

2. Mitigation Technologies

The objective of this mission is to provide an overview of what exists in terms of information sources for mitigation technologies and facilitate assessing their potential in the concerned countries and access to these information sources. This also includes coordinating national exercise aiming at improved knowledge and understanding of these technologies, their economic and environment benefits and secondly to establish cost criteria for which will be an input for prioritization of low carbon technologies.

Tasks to be performed are as follows:

- Survey of existing databases on mitigation technologies
- Facilitation of information to countries with respect to mitigation technologies.
- Elaboration of cost criteria for prioritization of low carbon technologies (as given in the TNA handbook).
- Supporting countries to develop cost effectiveness criteria which can serve as the basis for prioritization amongst low carbon technologies
- Review and consolidate abatement costs for different countries
- .Work in close cooperation and train counterparts in at least 3 regional centers of excellence.
- Support the countries in their prioritization exercise
- Work in consistency with methodology expert.
- Participate in workshops
- Develop guidelines for use by regional centres for training other countries.

The consultant will review mitigation related TNA analysis for 15 countries.

Minimum qualification

University degree in Engineering and or Economics

Knowledge of English is essential

In depth knowledge of energy systems and familiarity with models.

At least 10 years of experience in energy and or industry related to renewable energy and or energy efficiency.

Candidates from GEF beneficiary countries will be considered favourably.

3. Adaption Technologies and Options

Adaptation technologies are more dispersed than mitigation ones, and databases are hence less readily usable for the TNA/TAP exercise. Nevertheless given the urgency of the needs, the consultant will provide an overview of what exist and of what type of technology is well adapted to reduce climate change risk per type of issues witnessed at national level: i.e. coastal zone, crop improvement, water management, flood control, infrastructure protection etc.

Tasks to be performed are as follows:

- Survey of existing databases on adaptation technologies
- Facilitation of information to countries with respect to adaptation technologies.
- Elaboration of cost criteria for prioritization of technologies (as given in the TNA handbook).
- Supporting countries to develop cost effectiveness criteria which can serve as the basis for prioritization of technologies for adaptation
- .Work in close cooperation and train counterparts in at least 3 regional centers of excellence.
- Support 15 countries in their prioritization exercise
- Participate in workshops
- Develop guidelines for use by regional centres for training other countries.

The consultant will review adaptation related TNA analysis for 15 countries.

The consultant will review and clear 15 adaptation prioritization exercises serving as input to TNAs. A report on needed improvement in information on adaptation technologies and a synthesis of innovation in approaches to choose adapted technologies will also be produced.

Minimum qualifications:

University degree in water management, agronomy and/or economics.

Proficiency in English

At least 15 years of experience in one of the priority fields for adaptation (Water, infrastructure, agriculture) with a focus on climate risk mitigation

Candidates from GEF beneficiary countries will be considered favourably.

4. Policies (Economic instruments, awareness and information etc.)

The objective of the mission is to highlight conditions in terms of policy, economic instruments, awareness and information, needed for effective transfer of the technologies identified in the TNA exercises.

Tasks to be performed:

- Prepare framework for analysis of policy barriers and measures to overcome them.
- Define optimal policy conditions for effective technology transfer based on expert knowledge and interviews with technology providers in project countries and abroad. These include fiscal conditions, property right, standards and related regulation, accounting rules and exceptions, awareness level, etc.
- Prepare guidelines for analysis of policies and related barriers for technology transfer and measures to overcome them.
- Provide training and work with regional centres and 15 countries in analysing policies barriers and preparing package of policies to facilitate technology transfer. Test applicability of recommendations to improve the policy environment at national level with the aim of finding the best applicable solution in the country concerned.
- Work in close cooperation and train counterparts in at least 3 regional centers of excellence.
- Participate in a minimum of 3 workshops

Ultimate outputs will be a guide to improve policy environment and favour technology transfer, with a focus on causality related lessons learned and 15 high quality action plans for policy environment improvement.

Minimum qualification

University degree in economics, finance, law and/or information management

Expert on technology transfer with a minimum of 10 year experience within a public institution in charge of technology development and or transfer.

Fluent in English.

Candidates from GEF beneficiary countries will be considered favourably..

5. Financing and financial instruments

The objective of the mission is to characterize the conditions under which technology transfer can take place from the financial standpoint and identify the measures that can be taken at national level to meet these conditions. While technologies do require financing, various type of financing instruments do exist today, and their scope is expanding rapidly. They include various types of loans/ syndication, equity raising instruments, vendor financing, JV options, carbon finance etc. The aim is not to micro analyze the options existing in 15 countries, but rather characterize the minimum conditions which should exist for technology transfer to take place in a country, provide tools to analyze the gaps or barriers and identify options allowing to fill these gaps.

Tasks to be performed:

- Prepare a framework for analysis of financial barriers to technology transfer and measures to overcome them.
- Provide expert knowledge on minimum conditions required to achieve technology transfer.
- Prepare guidelines for establishing a financial framework to facilitate financing of technology transfer
- Provide training and work with regional centres and 15 countries in analysing financial barriers and creating an enabling financial framework for technology transfer. Provide a matrix showing which market conditions can, in various combinations, meet the conditions for technology transfer to take place
- Participate in training workshops
- Work in close collaboration with a minimum of 3 regional centers of excellence

The consultants will produce a report highlighting minimum finance related conditions to allow technology transfer and secure high quality outputs of 15 financial action plans to serve as inputs in TAPs.

Minimum qualifications

University degree in economics and finance

Proficiency in English

Minimum of 10 years experience in the finance sector in developing financial models for supporting new markets and technologies.

6. Legal, regulatory environment & Institutional Structure

For effective transfer of mitigation technologies a number of legal and regulatory conditions are key including licensing, feed in tariffs and conditions, energy supply contracts, etc. Both the numbers and the process under which institutions operate are equally important. Also when envisioning TAPs implementation, institutional reform, responsibility sharing aspects and decision making processes are important aspects.

Tasks to be performed

- Provide expert knowledge on legal and regulatory conditions needed for technology transfer.
- Prepare a framework for analysis of gaps by the countries.
- Prepare guidelines for establishing a facilitating legal and regulatory framework for technology transfer, considering the global regime in this area.
- Support country teams in their analysis of gaps at national level.
- Provide training and work with regional centres and 15 countries in analysing gaps and developing enabling regulatory regime.
- Work in close collaboration and train a minimum of 3 regional centers of excellence.
- Propose institutional analysis tools and assist in a minimum of 3 workshops.
- Review 15 TAPS for quality assurance.

Minimum qualifications

University degree in Environmental science, law or economics

Knowledge for SWOT and other analysis tools

Proficiency in English

Minimum 10 years experience in public institutions in various regions with a focus on legal and regulatory reforms.

Candidates from GEF beneficiary countries will be considered favourably.

7. Technology Action Plan (Template and support)

The TAP will systematically address practical actions necessary to reduce or remove policy barriers, finance related barriers and technology specific barriers. The plan will also address necessary actions in terms of solving interactions between various barriers and address the necessary timing.

The Technology Action Plan is a new feature in the Technology Need Assessment of the GEF. It is the tool which should serve as support to actual implementation of technology transfer based on the thorough analysis carried out. This document, conceived, ideally to be approved and endorsed at highest national level in each of the countries concerned, should contain all the elements needed to both understand the priorities, grasp the benefits and co benefits, envision policy and institutional reforms needed to enhance technology transfer, and contain the tools to follow action and evaluate impacts of implementing such a plan. Concrete and practical in essence, it should also be concise enough to be read by high level decision makers.

Hence, while the technical exercise will be crucial to qualify accurately the potentials and needs, assess the barriers and elaborate barrier removal action plans, this formalisation exercise is an essential tool towards practicality and in the end implementation of the plan.

Some level of homogeneity will also mean meaningful reporting to the convention and easy aggregation of the exercise for the parties to the same.

Tasks to be carried out are as follows:

- Develop a process oriented approach involving various stakeholders and a template for preparation of the Technology Action Plan (TAP).
- Providing training on preparation of TAP comprising targeted actions for creating an enabling framework for technology transfer and diffusion through barrier identification and removal strategies to the countries and regional centres.
- Facilitate preparation of TAPs in initial 15 countries.
- Prepare guidelines for preparation of TAPs. The consultant will be in charge of supervising the elaboration of national TAP documents based on the above template

Minimum qualifications

University degree in engineering, environmental science, law or economics.

Proficiency in English

Minimum of 5 years experience in national planning in various regions with a focus on technology transfer

8. Capacity Building- Development of training and support material

Base on the various output of technical nature, the challenge of the present initiative and the aim of the present consultancy service, is to effectively transfer the knowledge and associated tools to national teams, composed of diverse population, from various countries, with different culture, languages, background and specialties.

Advanced capacity building techniques, based on participative approaches, are successfully applied at international level both in the public and the private sector. They entail the elaboration of capacity building material used during workshops by country teams and leading the exercise during the workshops.

The present initiative contemplates 6 training workshops. The consultants will, for each workshop

- Elaborate on material produced during the project, in particular by project team and specialized consultants to produce specific capacity building tools to be used during training workshops. This includes preparation of training materials based on the reports and guidelines produced by the specialised consultants.
- Conceive simplified national exercises, to be carried out in maximum half a day,
- Work in close cooperation and assist in training 15 national teams and build capacity of the regional centers of excellence to prepare them to take an active part in subsequent training / capacity building workshops and country support.
- Provide an adapted agenda for each training workshops securing sustained interest, effective knowledge transfer, integration and full comprehension of the transferred knowledge through carrying out test exercises, and feed back procedure towards continued improvement of workshop organization.
- Assist the workshops, present the philosophy of the workshop, organize and plan intervention of various experts and participants, organize exercises, support knowledge integration process
- Produce workshop report including results of the participants exercise, and feed back from participants.

Minimum qualifications

University degree in economics, environmental science or engineering

Proficiency in English

Knowledge of capacity building tools Minimum of 10 years experience in capacity building in various regions. Experience in supporting national planning exercises will be a plus.