

# THE CLEAN DEVELOPMENT MECHANISM (CDM) AND ITS RELEVANCE FOR PAKISTAN

## *Part II: Suggested steps to be taken*

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## 1. Introduction

According to the overwhelming majority of the global scientific community greenhouse gas (GHG) emissions will lead to global warming. And as a result of the international negotiations governments and companies of the industrialised countries are committed to reduce their emissions. The Clean Development Mechanism of the Kyoto Protocol gives these countries the opportunity to reach their quantified emission limitation and reduction objectives (QUELROs) by financing emission reduction projects in developing countries. This implies that the developing countries will have to be prepared to attract investment in CDM projects from industrialised countries.

**Part I** of this paper ("The CDM in general"; which was published separately) gives a general overview on the current status of the international Climate Change negotiations and the specific CDM related rules which specify the procedures for implementing CDM projects and gaining Certified Emission Reductions (CER).

The present **Part II** of the paper explains the major steps to be taken by the Government of Pakistan on the way to successfully implemented and certified CDM projects.

This paper is regionally focussing on the relevance of the CDM for Pakistan as one of the smaller non-Annex I CDM host countries. Thematically the main aim of this paper is to provide policy support for the preparedness of Pakistan to the upcoming global climate change regime and the international emission trading in the framework of the Kyoto Protocol (KP) of the United Nations Framework Convention on Climate Change (UNFCCC).

This paper is not trying to provide precise advices for carrying out specific CDM projects and it is not trying to be a CDM handbook. The author gives an overview on the current status of CDM rules and procedures and he is especially trying to provide a link from the CDM to the adaptation and capacity building needs in Pakistan.

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Reform of the power sector through restructuring and deregulation is high on the agenda of the Government of Pakistan (GOP). The GOP is committed to pursue a far reaching reform program for the power sector to help meet the country's future energy needs. This reform includes

the development of indigenous resources for power development.

This project will aid in meeting this objective as it has the goal to develop renewable energy systems, in particular hydropower, at economically efficient costs while mitigating any negative social and environmental aspects. Under this objective the entire population of Pakistan, including the governmental and non-governmental sectors, are defined as the target group as they will all profit from an electricity supply increasingly based on local energy resources.

Within these target groups, the private sector as well as other groups that have influence on the environmental standards and the socially acceptable development of hydropower is of particular importance. The political responsible as well as the implementing agency is the Ministry of Water and Power and within the Ministry, the Central Coordinating Unit (the technical unit for water power affairs in the Office of the Chief Engineering Advisor) and the PPIB (Private Power and Infrastructure Board).

The intermediary agents are HEPO (the water power planning organization of WAPDA), WEA (WAPDA Engineering Academy) and CEWRE (the Centre of Excellence in Water Resource Engineering at the University for Engineering and Technology, Lahore).

Furthermore, the project comprise capacity building on the provincial level in appropriate hydro power projects.

### Box 1: Main Inputs of GTZ Hydropower Promotion Project (HPP):

- Give priority to the role of hydropower development
- Develop and introduce appropriate regulations and energy policy reform for use in sustainable hydropower development
- Prepare a strategy for developing and financing hydropower projects
- Integrate concerns of EIA and WCD into appropriate environmental regulations
- Strengthen the energy and power related institutions for ensuring the environmentally and socially sound development of water power through dialogue with the decision makers.

## 2. Climate Change Preparedness Strategy

### 2.1. Global climate change and its effects on Pakistan

#### 2.1.1. Vulnerability of Pakistan – Risks of Climate Change to Sustainable Development

For many developing countries a direct link between sustainable development criteria for CDM projects on the one hand and vulnerability to climate change on the other hand is evident. Implementation and performance of CDM projects in Pakistan can help to reach both targets, sustainable development and protection from climate change.

##### (1) Climate Change is a reality

The *Intergovernmental Panel on Climate Change* (IPCC) as the main institution for global warming analysis has noticed that the likelihood of global warming is rising. Currently available general circulation models (GCMs) suggest that the area-averaged annual mean warming would be about

3°C in the decade of the 2050s and about 5°C in the decade of the 2080s over the land regions of Asia as a result of future increases in atmospheric concentration of greenhouse gases.

An annual mean increase in precipitation of approximately 7% in the 2050s and approximately 11% in the 2080s over the land regions of Asia is projected from future increases in atmospheric concentration of greenhouse gases (IPCC 2001a).

##### (2) Developing countries will be affected

Although area-averaged annual mean precipitation is projected to increase in temperate Asia, a decline in summer precipitation is likely over the central parts of arid and semiarid Asia. Because the rainfall over this region is already low, severe water-stress conditions—leading to expansion of deserts—are quite possible, with rises in surface air temperature and depletion of soil moisture.

The socioeconomic environment of many countries in Asia is characterized by high population density and relatively low rates of economic growth.

##### (3) Existing vulnerability to climate change

For Pakistan the overall situation is similar so several of the following problems are likely to occur here, too. Also in Pakistan surface water

#### Box 2: Major climate change vulnerability risks in Asia

Based on present scientific research, the following risks linked to changes in climate and its variability for Asia are identified:

- The dangerous processes of permafrost degradation resulting from global warming would increase the vulnerability of many climate-dependent sectors affecting the economy in boreal Asia. \*\*\*
- Surface runoff increases during spring and summer periods would be pronounced in boreal Asia. \*\*\*
- The frequency of forest fires is expected to increase in boreal Asia. \*\*\*
- The large deltas and coastal low-lying areas of Asia could be inundated by sea-level rise. \*\*\*\*
- The developing countries of temperate and tropical Asia already are quite vulnerable to extreme climate events such as droughts and floods; climate change and its variability could exacerbate these vulnerabilities. \*\*\*\*
- Increased precipitation intensity, particularly during the summer monsoon, could increase flood-prone areas in temperate and tropical Asia. There is a potential for drier conditions in arid and semi-arid Asia during summer, which could lead to more severe droughts. \*\*\*
- Freshwater availability is expected to be highly vulnerable to anticipated climate change. \*\*\*\*
- Tropical cyclones could become more intense. Combined with sea-level rise, this impact would result in enhanced risk of loss of life and properties in coastal low-lying areas of cyclone-prone countries of Asia. \*\*\*
- Crop production and aquaculture would be threatened by a combination of thermal and water stresses, sea level rise, increased flooding, and strong winds associated with intense tropical cyclones. \*\*\*\*
- Warmer and wetter conditions would increase the potential for a higher incidence of heat-related and infectious diseases in tropical and temperate Asia. \*\*\*
- Climate change would exacerbate threats to biodiversity resulting from land-use/cover change and population pressure in Asia.\*\*\*

Certainty level from (\*) "very low confidence" to "very high confidence" (\*\*\*\*).

Source: (IPCC 2001a)

and groundwater resources play vital roles in forestry, agriculture, fisheries, livestock production, and industrial activity. Therefore the water and agriculture sectors are the most sensitive to climate change-induced impacts in Pakistan. Among others (see Box 2) the following impacts on Asian ecosystems are predicted by the IPCC (2001a):

- Forest ecosystems in boreal Asia would suffer from floods and increased volume of runoff associated with melting of permafrost regions.
- The dangerous processes of permafrost degradation resulting from global warming strengthen the vulnerability of all relevant climate-dependent sectors affecting the economy in high-latitude Asia.
- Although the frequency and severity of floods eventually would increase in many countries of Asia, arid and semiarid regions of Asia could experience severe water-stress conditions.
- The stresses of climate change are likely to disrupt the ecology of mountain and highland systems in Asia.
- Major changes in high-elevation ecosystems of Asia can be expected as a consequence of the impacts of climate change.
- Many species of mammals and birds and a large population of many other species in Asia could be exterminated as a result of the synergistic effects of climate change and habitat fragmentation.
- Glacial melt also is expected to increase under changed climate conditions, which would lead to increased summer flows in some river systems for a few decades, followed by a reduction in flow as the glaciers disappear.

From the economic view these impacts on the Ecology could lead to impacts on several economic fields:

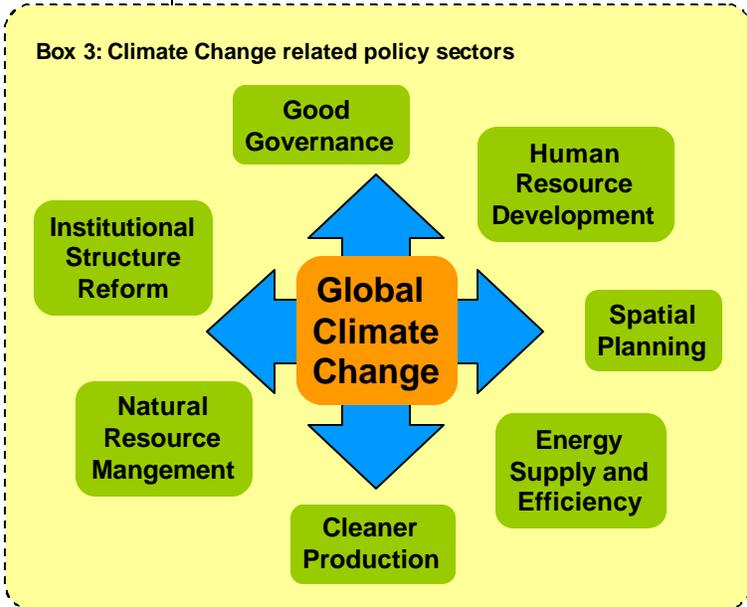
- Losses in the amount of agricultural production
- Decrease of food security
- Decrease in the productivity of warm- and coolwater fishery

Most countries will not be able to just wait for the unsure effects of the mitigation of GHGs by the Kyoto Protocol. The dramatic impacts of the pre-

dicted global climate change described above will take place anyhow to a yet unknown extent. So the implementation of adaptation measures will be crucial even if the reduction of GHGs striven by the Kyoto Protocol will occur soon.

### 2.1.2. Adaptation versus mitigation – different forms of and different tasks in preparedness

The *Third IPCC Assessment Report* (IPCC 2001a) confirmed the potentially devastating impacts of the ongoing global climate change. No amount of adaptation can replace mitigation measures. And even the strongest mitigation efforts can not eliminate the need for adaptation measures in many countries. Therefore this chapter should not be titled "*adaptation versus mitigation*" but "*adaptation plus mitigation*"! Both have to be implemented hand-in-hand.



During recent years the main focus of the international climate change negotiations was set on reducing GHG emissions by mitigation measures (Michaelowa 2001). The Kyoto Protocol as one of the main global GHG mitigation instruments set legally binding reduction targets for the industrialised countries and will hopefully come into force in the near future. But nevertheless most countries worldwide will have to prepare themselves for the upcoming climate change detected by the IPCC. Therefore the implementation of adaptation measures will be crucial. For developing countries like Pakistan which are not that attractive for CDM investment yet adaptation will become much more important because there is only a small amount of emissions that can be reduced in these countries.

The impacts global climate change will cause to human systems include mainly water resources; agriculture (especially food security) and forestry; coastal zones and marine systems (fisheries); human settlements, energy, and industry; insurance and other financial services; and human health (IPCCb).

Several policy sectors are affected by climate change and should be included in adaptation and mitigation policy changes (see Box 3).

In all of these sectors human resource development, capacity building and training of governmental stakeholders for climate change impact preparedness should take place (see Chapter 3).

The UNFCCC has adopted three Funds to support adaptation activities in non Annex I countries (see Box 4). The LDC Fund, which is the only Fund of the three that is currently operational, is supporting the Least Developed Countries (LDC) to prepare their National Adaptation Programmes of Action (NAPAs). NAPAs will communicate priority activities addressing the urgent and immediate needs and concerns of the least developed countries, relating to adaptation to the adverse effects of climate change. The rationale for developing NAPAs rests on the low adaptive capacity of LDCs, which renders them in need of immediate and urgent support to start adapting to current and projected adverse effects of climate change. Activities proposed through NAPAs would be those whose further delay could increase vulnerability, or lead to increased costs at a later stage.

In addition, knowledge generation and dissemination related to climate impacts and vulnerability assessments are essential for making poverty reduction strategies more effective by mainstreaming and integrating climate issues. The IPCC has played a key role in reviewing and synthesizing information about climate change, its impacts, and potential adaptation measures, with a view to informing the UNFCCC negotiations. This knowledge needs to be made more accessible to decision makers, development agencies, and civil society in order to enable them to use it to inform their own work.

Finally, the implementation experience of the development agencies needs to be shared with the UNFCCC process with a view to informing the dialog on opportunities available to integrate adaptation responses in sustainable development. Accordingly, the sharing of analytical tools and project experience should be promoted and interagency collaboration should be enhanced (Sperling 2003).

#### **Box 4: UNFCCC Climate Change Adaptation Funds**

In July 2001, the COP created three new funds to further assist developing countries to adapt for climate change impacts (see below). Many developed countries also pledged a combined contribution of € 450 million per year by 2005 through these funds plus existing avenues to help developing countries manage their emissions and adapt to climate change.

##### **Least Developed Country Fund (LDC):**

The LDC Fund, which is the only Fund of the three that is currently operational, is supporting the Least Developed Countries to prepare National Adaptation Programmes of Action (NAPAs). This is accompanied by the formation of the Least Developed Countries Expert Group (LEG), which is emphasizing the focus on poverty reduction during adaptation planning..

##### **Special Climate Change Fund (SCCF):**

The special climate change fund will finance activities relating to climate change in the areas of adaptation; technology transfer; energy, transport, industry, agriculture, forestry and waste management; as well as activities to assist developing countries whose economies are highly dependent on income generated from fossil fuels in diversifying their economies.

##### **Kyoto Protocol Adaptation Fund:**

This adaptation fund, operating under the Kyoto Protocol, will be financed from the "share of the proceeds" on the CDM and other sources of funding. Revenues from 2% of the credits generated by clean development mechanism projects will be paid into this fund.

Source: [www.unfccc.org](http://www.unfccc.org)

## 2.2. The recent Climate Change Policy of Pakistan

### 2.2.1. Activities in the Past

In the past 15 years Pakistan carried out some major steps in the framework of the UNFCCC.

#### (1) The ALGAS Project

The Pakistan national inventory of GHG sources and sinks is being prepared as part of the Asia Least-cost Greenhouse Gas Abatement Strategy (ALGAS) Project. The broader objective of the ALGAS project is to provide a framework for selected countries in the Asian region enabling them to evolve a strategic plan that effectively reduces the growth in emissions of greenhouse gases, in particular CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, and others. The National GHG Inventory is the first of three main components of the ALGAS project and has been funded through the GTZ. The remaining two project components, i.e., the identification of GHG mitigation options and projects, and the development of a least-cost national GHG abatement strategy, follow from the preparation of the Pakistan National GHG Inventory. These project components have been financed by the Global Environment Facility (GEF) and are being implemented by the Asian Development Bank (ADB).

#### (2) National GHG Inventory as part of the ALGAS project

As a first step in preparing the national GHG inventory, a preliminary GHG inventory was prepared in February 1996. This report identified the procedures prescribed by the Inter-governmental Panel for Climate Change (IPCC) for estimating a national GHG emission inventory in six source categories, i.e., energy, industrial processes, solvents and other uses, agriculture and livestock, forestry and land use change, and waste. In particular, the Report documented GHG emissions from the energy sector using the IPCC-recommended top-down Reference Approach. The Report also identified secondary information sources that could provide the emission and activity data needed to prepare the Inventory. Additional data requirements were also identified for cases where existing information is lacking in form or content that the inventory needs, such as in agriculture and livestock, waste and industrial processes (GTZ 1998).

#### (3) Pakistan's Initial Communication on Climate Change

Pakistan's Initial Communication was published in November 2003. It contains a huge amount of

data and policy advices concerning mainly the following fields:

- National Circumstances
- GHG Inventory
- Climate Change Impact in Key Sectors
- Adaptation Measures
- Education, Training and Public Awareness

In addition to these UNFCCC related steps a number of activities is needed to be prepared for the Kyoto Protocol and especially for the performance of CDM projects in Pakistan.

### 2.2.2. Ongoing Activities

Pakistan hasn't signed nor ratified the Kyoto Protocol yet. But Pakistan took several steps towards the participation in the international climate change regime:

- The Ministry of Environment is registered as **Designated National Authority** at the UNFCCC
- A **National Focal Point on CDM** will likely be established at the Ministry of Environment in the near future

The Government of Pakistan (GoP) decided recently to force the process leading to the ratification of the Kyoto Protocol. The Ministry of Environment (MoE) declared its willingness and ability to identify and implement CDM projects in Pakistan.

Pakistan is not one of the "big" CDM host countries (which most likely will be China, India and Brazil) but it has a huge potential of renewable energy and energy efficiency CDM projects.

## 2.3. The CDM in Pakistan – Suggested Steps to be taken

Several steps have to be taken and barriers have to be removed to attract foreign investment in CDM projects in Pakistan. The main measures that have to be implemented and carried out in the near future so that Pakistan could be part of the CDM regime will be described below (see Box 5).

There is a lot of literature available on the developing country's needs in building the institutional framework for the successful implementation of CDM projects. This chapter refers mainly to the very useful Guideline "Establishing National Authorities for the CDM" published by the *International Institute for Sustainable Development and the Center for Sustainable Development in the*

Americas (CSDA 2002). Therefore this chapter is concentrating on providing additional support focused on specific needs for Pakistan.

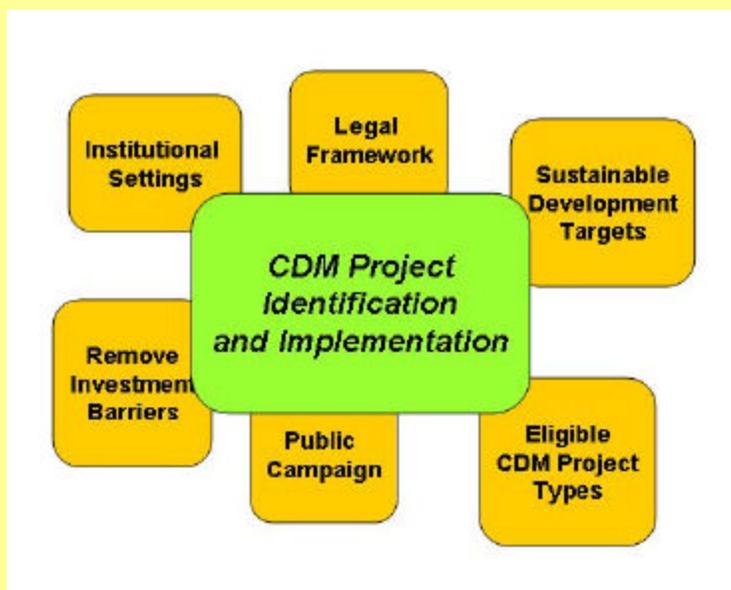
### 2.3.1. Institutional Settings – The DNA

Implementation of a Designated National Authority (DNA) is a prerequisite for the participation in the market for Certified Emission Reductions (CER) gained by CDM projects. The “Marrakech Accords” (The outcomes of COP 7, 2001) indicate that “Parties participating in the CDM shall

Therefore the DNA should also have the following functions (OECD 2004) in addition to simple project approval:

- Provide CDM information within the country
- Ensure appropriate legal framework (see chapter 2.3.2)
- Ensure investment security (see chapter 2.3.3)
- Technical info (e.g. baseline methodologies)
- Worldwide promotion as CDM host country
- Development of and insure compliance with national sustainable development criteria (see chapter 2.3.5)

**Box 5: Suggested Steps to be taken towards the attraction of foreign investment in CDM projects**



- Definition of eligible CDM project types (see chapter 2.3.6)
- Capacity building (see chapter 3)

Only when reaching these targets the Government of Pakistan will be able to attract foreign investment in sustainable CDM projects.

### 2.3.2. Legal Framework

Each project investor has to be sure that the CDM procedure is included in the national legislation. Several laws and regulations have to be changed or added so that the project implementation can take place.

designate a national authority for the CDM<sup>1</sup>. This “Designated National Authority” (DNA) needs to provide written approval of a Party’s participation in a particular CDM project activity, and – for host countries – confirm that the project activity assists it in achieving sustainable development (see chapter 2.3.5). Thus, potential project participants and investors need DNA approval of their proposed project activity before it can generate emissions credits (OECD 2004).

This means that in the host country at least a minimum of institutional settings have to be implemented. But it has to be kept in mind that a lot of developing countries are competing for CDM project investment from Annex-I-Countries.

Reviewing existing legal framework regarding CDM activities:

- Laws: Land, Environment, Oil and Gas
- Regulations, rules
- Policies, Programs, Developing plans at sector and National level

Depending on the portfolio of eligible CDM project types defined by the GoP (see chapter 2.3.6) the following industrial sectors might be targeted:

- Electrical sector
- Coal sector
- Oil and Gas sector
- Agricultural sector
- LULUCF sector

<sup>1</sup> UNFCCC Decision 17/CP.7; Article 29 (see also annex 1 of Part I of this paper)

- Transportation sector

For the smooth implementation of CDM projects evaluation criteria and the CDM project cycle have to be established:

- Compulsory criteria
- Prior criteria
- CDM project cycle

### 2.3.3. Elimination of Investment Barriers

There are two main investment barriers that have to be eliminated to attract foreign financing of CDM projects in Pakistan:

#### (1) General barriers related to any investment in Pakistan

General barriers for investment in Pakistan are mainly the same than in other developing country:

- Unstable political and environmental circumstances
- No guaranty for investment security over longer project lifetimes
- 

#### (2) Transaction costs related to CDM projects specifically

- Project search, preparation, feasibility study
- Negotiating Emission Reduction Purchase Agreement (ERPA)
- Baseline determination
- Monitoring plan
- Project Design Document (PDD)
- Validation
- Registration

These transaction costs will make CDM projects more costly than others. Especially the baseline determination and documentation as well as the monitoring of the emissions reduced by the CDM project are additional to those occurring in common projects.

Therefore it's even more important to minimize these costs to attract foreign investment in CDM projects. Only when the transaction costs are smaller than the suspected price for the CERs gained by the project it will reach the break even point.

### 2.3.4. CDM related technology transfer

Technology transfer (TT) is a highly complex process closely related to capacity building (see chapter 2.3.7). TT is influenced by different domestic and international factors, stakeholders and actors. Technology transfer is not simply about the supply and shipment of hardware across international borders. It is about the complex process of sharing knowledge and adapting technology to meet local conditions. It strengthens human and technological capacity in developing countries. It promotes commercial markets for climate-friendly technology (Smith 2001).

#### (1) International regulations

There are some international regulations dealing with technology transfer, too:

- The **Rio Declaration** of 1992 mentions technology transfer in the context of capacity building and sustainable development: *"States should cooperate to strengthen en-*

#### Box 6: Important aspects of technology transfer (TT) for developing countries like Pakistan

1. International Regulations
2. Barriers to TT
3. TT mechanisms
4. TT modes
5. Enabling environment
6. Intellectual property rights

*ogenous capacity building for sustainable development... through exchanges of scientific and technological knowledge, and by enhancing the development, adaptation, diffusion and transfer of technologies".*

- Article 4c of the **UNFCCC** asks the Parties to: *"Promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors";*
- Article 10 (c) of the **Kyoto Protocol** asks all Parties to: *"Cooperate in the promotion of effective modalities for the development, application and diffusion of, and take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies, know-how, practices and processes pertinent to*

*climate change, in particular of developing countries, including the formulation of policies and programmes for the effective transfer of environmentally sound technologies that are publicly owned or in the public domain and the creation of an enabling environment for the private sector, to promote and enhance the transfer of, and access to, environmentally sound technologies” (quotations from Toufiq 2001).*

In recent COPs technology transfer and capacity building related to climate change were amongst the main topics for negotiation. The UNFCCC established a Technology Transfer Clearing House (TT CLEAR) in 2001 with *“the task of devising options for implementing the Convention and Protocol commitments on the development and transfer of climate-friendly technologies”*<sup>2</sup>.

The decisions completed at COP 6 II in Bonn cover five key themes and areas for meaningful and effective actions:

- Technology needs and needs assessments;
- Technology information;
- Enabling environments;
- Capacity-building; and
- Mechanisms for technology transfer.

The technology transfer issue was negotiated on each of the following COPs by now. For most of the developing countries it is the most important issue in the UNFCCC framework. China for example excluded unilateral CDM projects (see Chapter **Error! Reference source not found.**) from its portfolio because technology transfer will not take place in such projects (see Box 6).

## **(2) Barriers to technology transfer**

The main factors that contribute to making technology transfer difficult are:

- Shortages of financial resources and of skilled personnel;
- Inadequate information about the full range of technologies available for a specific task;
- Information about the economic, environmental, and social costs and benefits of specific technologies;
- Lack of mandated governmental and scientific institutions able to deliver this information;
- Lack of available governmental funding (Toufiq 2001).

<sup>2</sup> Further information: <http://ttclear.unfccc.int/ttclear/jsp/>

## **(3) Mechanisms for transfer**

Since the private sector is expected to play a prominent role in CDM, its share in technology transfer through this mechanism is expected to be important.

Since today the main international institutions that supported technology transfer related to climate change were

- Official Development Assistance (ODA),
- The Global Environment Facility (GEF),
- Multilateral development Banks (e.g. the World Bank and the Asian Development Bank,
- Agencies of the United Nations such as UNDP and UNEP,
- Governmental organizations and
- Private sector participants in UNFCCC and the Kyoto Protocol Mechanisms.

## **(4) Modes of technology transfer**

Technology can be transferred in different modes such as :

- Transfer of capital goods, services, and design specifications.
- Skills and know-how for production.
- Knowledge and expertise for managing technological change.
- Maintenance and operation of hardware.

## **(5) Enabling Environment**

Governments can take a number of steps to encourage and facilitate the transfer of environment-friendly technologies. Such steps could include (source: Toufiq 2001):

- Promoting competitive and open markets for environmentally sound technologies (ESTs);
- The setting of environmental goals and priorities;
- Simplifying and making transparent the procedures for project approval;
- Simplifying and making transparent the procedures for public procurement;
- Enacting laws and regulations to ensure that prices reflect environmental and social costs;
- Removing subsidies from technologies that are damaging to the environment;
- Providing subsidies for technologies that are beneficial to the environment;
- Vigorously enforcing relevant laws and regulations;

- Protecting intellectual property rights and licenses;
- Opening up of national capital markets;
- Reducing bureaucratic obstacles;
- Education and training;
- Integration of environmental concept into the policy-making process.

### (6) Intellectual Property Rights

Intellectual Property Rights (IPRs) are designed to enable persons or organizations to benefit from their innovations and intellectual endeavours. IPRs include patents, copyrights and related rights, plant breeder rights, trade secrets, trademarks (including service marks), industrial designs, layout designs of integrated circuits, geographical indications, and (IPCC, 2000; WTO, 2000). Patents are granted by governments to inventors to exclude third parties from exploiting the invention in the countries where they are registered without the explicit consent of the holder of the patent. By definition, inventions have to be new and have an inventive step and industrial application (Toufiq 2001).

Weak IPR regimes in the host countries might discourage the foreign firms to invest in these countries. The insecurity that the transferred technology may be copied or replicated in the host country might lead to refusal by the firms in developed countries to transfer ESTs. It is important for the countries to strengthen their IPR regimes in order to encourage transfer of ESTs of both public and private origins (TERI 2003).

The extent of protection afforded by Intellectual Property Rights and the enforcement of these rights varies considerably from one country to another.

As intellectual property became more important in trade, these differences became a source of tension in international economic relations. New internationally-agreed trade rules for intellectual property rights were seen as a way to introduce more order and predictability, and for disputes to be settled more systematically<sup>3</sup>. The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) is an attempt to narrow the gaps in the way these rights are protected around the world, and to bring them under common international rules.

The TRIPS agreement (WTO 2001) covers five broad issues:

- How the basic principles of the trading system and other international intellectual property agreements should be applied;
- How to give adequate protection to Intellectual Property Rights;
- How countries should enforce those rights adequately in their own territories;
- How to settle disputes on intellectual property between members of the WTO;
- Special transitional arrangements during the period when the new system is being introduced.

The private sector owns the Intellectual Property Rights to most of the technology that is likely to be used in the context of global climate change, and agreements satisfactory to the users as well as the owners of the IPRs will have to be worked out to encourage the timely transfer of environment-friendly technologies (Toufiq 2001).

### (7) Requirements for success

Since the private sector is expected to play a large role in CDM, its concerns may need to be addressed explicitly. A major concern related to TT is the existence and implementation of intellectual property rights. Countries that have enacted the necessary legislation and are seen as enforcing it have a much greater likelihood of attracting CDM projects where leading edge technology is being transferred. Governments and corporations have to provide leadership in encouraging and facilitating technology transfer, and have to find the individuals from all sectors of society who are dedicated to the success of each CDM project involving technology transfer (Toufiq 2001).

## 2.3.5. Sustainable Development Targets

The Marrakech Accord state in its Decision 17/CP.7, Article 40 *“The designated operational entity (DOE)<sup>4</sup> shall prior to the submission of the validation report to the executive board, have received from the project participants written approval of voluntary participation from the **designated national authority** of each Party involved, including confirmation by the host Party that the project activity assists it in achieving **sustainable development.**”*

This means that the DNA must define the national sustainable development targets a CDM

<sup>3</sup> Further information: [www.wto.org](http://www.wto.org)

<sup>4</sup> The DOE is the independent evaluation and validation institution in the CDM process (see Part I of this paper).

project has to reach before the whole CDM process can start in the country itself.

### 2.3.6. Definition of Eligible CDM Project Types

The Government of Pakistan has to decide whether it would like to restrict CDM projects that will be implemented in the country to a specific list of project types.

China e.g. decided only to allow Renewable Energy and Energy Efficiency Projects in the CDM and to exclude LULUCF projects.

### 2.3.7. Capacity Building

“Capacity building” can be defined as the ability of individuals and institutions to make and implement decisions and perform functions in an effective, efficient and sustainable manner.

The UNDP identified the following three types of levels in capacity building (Zakri 2000):

1. At the individual level, capacity building refers to the process of changing attitudes and behaviours imparting knowledge and developing skills while maximizing the benefits of participation, knowledge exchange and ownership.
2. At the institutional level it focuses on the overall organizational performance and functioning capabilities, as well as the ability of an organization to adapt to change. It aims to develop the institution as a total system, including individuals, groups and the organization itself.
3. Traditionally, interventions at the systemic level were simply termed “institution strengthening.” This reflected a concern with human resource development as well as assisting in the emergence and improvement of organizations. However, capacity development further emphasizes the overall policy framework in which individuals and organizations operate and interact with the external environment, as well as the formal and informal relationships of institutions.

Capacity development can, thus, be considered at three levels, the individual, institutional, and the systemic. Interactions between these levels are also important to overall capacity. Capacity is relevant in both the short term (for example, the ability to address an immediate problem) and the long term (the ability to create an environment in which particular changes will take place). Capacity may imply “action,” or “inaction,” depending on the result desired. Capacity bottlenecks can occur

at local, national, or global levels and amongst any individual, or group, of stakeholders – both individuals and entities or institutions.

Viewed in a narrow sense, capacity development could focus on the ability of individuals and entities to act in the interest of the global environment alone. Or one could take a broader, systems approach that emphasizes the enabling environment at local, national and regional levels consisting of regulatory frameworks, information, knowledge and technologies, ultimately feeding in to improved global environmental management (Source: Zakri 2000).

Detailed information on capacity building needs especially for Pakistan can be found in Chapter 3.

## 2.4. Potential role of the CDM for Pakistan

The CDM as presented in the chapters above is of great relevance for the Pakistan not only with respect to financial issues but also in the context of technology and knowledge transfer and reaching sustainable development targets.

But there are also substantial risks related to the implementation of CDM projects for Pakistan.

First of all the amount of the CER market in the future is unknown and difficult to quantify. There is a potential risk that the number of realised and certificated CDM projects might be very small even for countries like China or India. In this case the financial investment in institutions and personnel might have taken place for nothing. The GoP has to be aware that the implementation of CDM institutional structures has to be combined with investment in institutional structures that can support as well the implementation of energy efficiency and renewable energy projects independent from the CDM.

The Kyoto Protocol is not yet ratified by the Russian government and therefore it is totally unsure whether it will entry into force or not. The EU will implement its emission trading system as of 2005 but whether the CDM will be part of it and from which year on is not yet decided finally.

So there are many uncertainties regarding the CDM implementation regime.

The second main aspect for Pakistan might be the linkage between mitigation and adaptation measures (see Chapter 2.1.2). The likelihood for manmade global climate change is increasing and therefore the government has to decide which amount of money will be spend for adaptation and which one for mitigation measures. When the climate changes more rapidly then

expected by the international scientific community it might be necessary to spend the main part of the available budget for adaptation measures like dams, dikes and the extension of uninhabited flood areas.

In the field of capacity building the main task for the government and other stakeholders might be to assure that most of the training and other human resource development measures are also useful for other needful fields that need capacity building.

In the case of the CDM these overlapping could be the promotion of:

- Implementation of Environmental Management Systems (EMS);
- Support of the use of renewable energies (Wind, Hydro, Solar etc.);
- Spatial and environmental planning;

Summarizing the CDM can be a very useful instrument for supporting the sustainable development of a country like Pakistan but all of the implemented structures should be able to be used in other fields as good as possible. Only in this case it is possible to avoid the wasteful spending of huge amounts of money not only from ODA but also from the developing country itself.

## 2.5. Potential role for Hydropower CDM Projects in Pakistan

Hydropower projects will be most likely most attractive for potential CDM project investment from Annex I Countries of the Kyoto Protocol.

The **GTZ Hydropower Promotion Project (HPP)** is supporting the development and implementation of hydropower stations nationwide.

The CDM related activities of HPP will help to build capacities for several stakeholders to successfully identify and implement CDM projects in Pakistan.

### 2.5.1. Current Hydropower Situation in Pakistan

#### (1) Power generation capacity of Pakistan

The total power generation capacity in Pakistan is of the order of 17,457 MW. This includes the hydropower generation capacity of 5,013 MW, the thermal power generation capacity of 12,169 MW and the nuclear power generation capacity of 462 MW. Based on the present generation

capacity, the hydro: thermal/ nuclear mix in the country is 29: 71.

The main sources of electricity generation in Pakistan are hydel, oil, gas, coal and nuclear power. Among these, hydel power is the only renewable source of energy; the others are mainly fossil fuels. Hydel power is also the least expensive form of electricity. The potential for hydropower generation in Pakistan is of the order of 40,000 MW (Source: *Pakistan Water Gateway*<sup>5</sup>).

#### (2) Hydropower and Hydrologic Variations

Hydropower generation is dependent on hydrological variations and irrigation release requirements. In early summer, the reservoir levels are generally low and the turbines operate at relatively low heads with consequently low power output. In flood season, the reservoir levels are high and large discharges can be passed through the turbines for maximum power generation. In winter, the irrigation requirements are low and the discharges for power generation are limited resulting in lower power output.

The hydropower production capacity of the existing plants, in a typical year, varies widely and gets as low as about 2,650 MW in May. However, the yearly average hydropower generation is of the order of 3,700 MW.

Hence, the installed capacity of hydropower plants has to be compared with the actual power generated during the year in order to assess the effects of hydrologic variations. In 2000-01, the total electricity generated was 68,117 GWh, of which only 25.2% was from a hydel source.

#### (3) Hydropower Generation Projects

There are five major hydropower generation projects in Pakistan: namely, Tarbela, Mangla, Warsak and Chashma and Ghazi Barotha which have a capacity of 3478, 1000, 240, 187 and 1450 MW respectively. There are also several smaller hydel schemes whose combined capacity is about 108 MW.

#### (4) Hydropower Development

There is a need to develop the hydropower capacity of Pakistan. The government is considering large projects like Basha to take care of future needs. Such projects will also add to the national storage capacity. Since the completion of Tarbela Dam in 1977, no major storage facility has been constructed. However, to augment the hydropower capacity, additional power units have been installed at Tarbela and the Mangla Raising Project is being undertaken. Two other hydro-

<sup>5</sup> <http://www.waterinfo.net.pk/index.cfm>

lectric power projects, namely the Chashma Hydropower Project and the Ghazi Barotha Hydropower Project, which do not include additional storage capacity/facilities have also been initiated. The Chashma Plant is now in operation and the Ghazi Barotha Project is nearing completion.

The capacities of the three existing reservoirs of the Indus Basin: Tarbela, Mangla and Chashma are declining due to sedimentation. The live storage capacity of the three reservoirs has been reportedly reduced by about 20%. WAPDA recently announced plans to undertake studies for a number of storage projects on the Indus and its tributaries including the Basha dam as well as several off channel storages in the Vision 2025 programme. This document forms part of the Ten Years Perspective Plan of the Government. The shortfall in power generation would be met through thermal generation.

### 2.5.2. Additionality Problems with Large Hydropower CDM Projects

Seven hydropower dam projects in Chile, Costa Rica, Panama, Peru and Uganda that have been proposed for climate emissions credits under the Kyoto Protocol are just business as usual and will not reduce emissions, charge two rivers protection organizations.

These seven hydro projects claimed for emissions credit under the CDM are already under development, and in some cases are nearly complete. They are business as usual projects that would go ahead without the CDM (CDM Watch 2002).

The Marrakech Accords, which defined the rules by which the CDM will function, state that to receive CDM credits a project must be **"additional"**, meaning that *"anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity."*

Giving these projects approval to generate carbon credits could turn the CDM into a subsidy mechanism for hydro developers and a carbon accounting loophole for industrialized countries, instead of a tool for climate protection."

The social and environmental damage that will be caused by some of these projects also means that they are in breach of the CDM's mandate to promote sustainable development.

Therefore the additionality as well as the sustainable development argument has to be kept in

mind when promoting "Big" Hydropower CDM projects in Pakistan<sup>6</sup>.

### 2.5.3. Small Hydropower CDM Projects

Small, mini and micro hydropower stations will create less problems with additionality and sustainable development targets because they will most likely

- Displace the use of fossil fuel or coal thermal power;
- Generate employment in the region where the project will be located.

The limit set by the UNFCCC to the so called "Small Scale CDM" Projects (SSC) was fixed at 15 MW (see Part I of this paper). This has to be kept in mind because there are several different levels for "small", "mini" or "micro" hydropower projects in each country or organisation.

For Small Scale CDM Projects there are simplified baseline and monitoring requirements to ease the implementation of these kinds of projects by reducing the relatively high transaction costs.

Another cost reducing approach is the bundling of a number of SSC projects to one CDM Project that will be validated and certificated only once.

### 2.5.4. How GTZ HPP can support Hydropower CDM Projects in Pakistan

The GTZ Hydropower Promotion Project has already identified a number of more than 1,000 potential hydropower sites in Pakistan!<sup>7</sup>

Several of these sites could be implemented as potential CDM projects with investment from Annex I Countries.

<sup>6</sup> See also World Commission on Dams press release June 2000 at: [http://www.dams.org/news\\_events/press333.htm](http://www.dams.org/news_events/press333.htm)

<sup>7</sup> see [www.pakhydro.com](http://www.pakhydro.com)

### 3. Capacity building needs for the Pakistan

The EMCP project is currently preparing two detailed guidelines as policy support tools for capacity building in the field of sustainable development:

1. *Guide to Capacity Building and Professional Exchange in Sustainable Development - A practical guide* (EMCP 2004a)
2. *Manual on Capacity Building and Training Management for Local Initiatives - A practical guide for training project managers* (EMCP 2004b).

Both guidelines will be published in the near future and will also be very useful for the preparation of CDM related capacity building measures. To avoid repeating this text will refer to these reports when necessary.

#### 3.1. Definitions of capacity building

Definition of Capacity Building from the Agenda 21 (UN, 1992): "Capacity building encompasses the country's human, scientific, technological, organizational, institutional, and resource capabilities. A fundamental goal of capacity building is to enhance the ability to evaluate and address the crucial questions related to policy choices and modes of implementation among development options, based on an understanding of environmental potentials and limits and of needs as perceived by the people of the country concerned. As a result, the need to strengthen capacities is shared by all countries".

The United Nations Framework Convention on Climate Change (UNFCCC), and the Kyoto Protocol make explicit references to the importance of capacity building (UNFCCC, 1997).

Article 5 of the UNFCCC states: "In carrying out their commitments under Article 4, paragraph 1(g), the Parties shall: (a) Support and further develop, as appropriate, international and inter-governmental programmes and networks or organizations aimed at defining, conducting, assessing and financing research, data collection and systematic observation, taking into account the need to minimize duplication of effort; (b) Support international and intergovernmental efforts to strengthen systematic observation and national scientific and technical research capacities and capabilities, particularly in developing countries, and to promote access to, and the exchange of, data and analyses thereof obtained

from areas beyond national jurisdiction; and (c) Take into account the particular concerns and needs of developing countries and cooperate in improving their endogenous capacities and capabilities to participate in the efforts referred to in subparagraphs (a) and (b) above."

Article 10(e) of the Kyoto Protocol asks all Parties to: "Cooperate in and promote at the international level, and where appropriate, using existing bodies, the development and implementation of education and training programmes, including the strengthening of national capacity building, in particular human and institutional capacities and the exchange or secondment of personnel to train experts in this field, in particular for developing countries, and facilitate at the national level public awareness of, and public access to information on, climate change. Suitable modalities should be developed to implement these activities, through the relevant bodies of the Convention, taking into account Article 6 of the Convention"<sup>8</sup>.

Article 14 of the CDM modalities (see Part I of this paper) "requests Parties included in Annex I to start implementing measures to assist Parties not included in Annex I, in particular the least developed and small island developing States among them, with building capacity in order to facilitate their participation in the clean development mechanism, taking into account relevant decisions by the Conference of the Parties on capacity-building and on the financial mechanism of the Convention".

These few citations show the overall importance of capacity building for all aspects of the global climate change issues including the CDM.

#### 3.2. Capacity building on different institutional levels

The first step in building capacity for the CDM in the host country is to develop a CDM strategy. The Chinese government already defined several conditions for the eligibility of CDM projects in Pakistan (see Chapter 2.2).

The available information and awareness in host countries on CDM is often limited. A second primary objective of capacity building is therefore to broaden the basis for climate change action by building links with existing networks involved in relevant sustainable energy and sustainable development activities (see Chapter 3.3.1).

To guarantee the sustainability of capacity building measures it is necessary to include all kinds

<sup>8</sup> Source: Toufiq 2001

of stakeholders from different institutional and geographical level. The capacities for implementing CDM projects the preparedness for climate change issues have to be build up.

### **3.3. General capacity building for climate change preparedness**

There is a great need to build capacity in many areas that are important for global climate change, including CDM, and for assessing the links between energy and environment. In most of the developing countries, there is a great shortage of scientists and skilled professionals in most fields, including those crucial for addressing global climate change. And although Pakistan is not lacking scientific knowledge on climate change it is necessary to increase institutional and individual capacities also in Pakistan. Therefore a major priority has to be to increase the pool of persons with expertise in a number of areas (Toufiq 2001 , modified) :

#### **(1) The scientific aspects of climate change**

The policymakers in each country need a pool of scientists in whose knowledge and judgement they have confidence. Expertise should be available in several areas, including atmospheric physics and chemistry, meteorology, general circulation computer models, forestry, and ocean sciences. E.g. in China several scientific institutions from different universities are dealing with climate change and CDM related issues. Nevertheless the growing amount of available climate change data and adaptation and mitigation related international rules involve the increase of capacity building in these sectors.

#### **(2) Estimating emissions of GHGs**

Scientific and technical expertise should be available for estimating emissions of carbon dioxide, methane, nitrous oxides and other greenhouse gases from the principal anthropogenic sources, including combustion of fossil fuels, industrial processes, changes in land use, vehicles, natural gas transmission systems, animals, landfills, and coal mines. These measurement techniques are necessary conditions for the GHG national communications to the UNFCCC.

#### **(3) Economic analysis of projects, including cost-benefit analysis.**

Many countries (e.g. Pakistan) already have a pool of persons experienced in carrying out the economic analysis of projects. This needs to be supplemented with expertise in the inclusion of externalities, which are particularly important for the assessment of environmental implications, such as health benefits.

#### **(4) Environmental and social assessment of projects and policies.**

Pakistan already implemented many laws to protect the environment and to assess environmental impacts and damages. This is a multidisciplinary area, and it is important that each country has a pool of personnel trained in carrying out such assessments.

The following list of capacity building needs was already discussed in chapter 2.1: Risk and vulnerability assessment; coastal zone planning; development and implementation of adaptation and mitigation techniques.

These more general capacity building needs can be seen as the basis for the specific CDM related capacity building needs which will be presented in the following chapter.

### **3.3.1. Utilizing global knowledge through worldwide information exchange**

Professional exchange seems to be an easy task if finances are available. Looking closer and taking the experience from professional exchange and visits in the past, it becomes more challenging and complex. If professional exchange should be more than "visiting other countries", if professional exchange should contribute to mutual capacity building, inter-cultural understanding and finally contribute to global sustainable development careful preparation, selection, implementation and follow up measures are neces-

#### **Box 7: Important CDM capacity building fields**

- Market assessment
- Preparation of business plans
- Evaluation and choice of technology options
- Investment promotion
- Financial advisory services
- Financial analysis
- Support to the management of tariff structures and the setting of accounting procedures.

*Source: Ministry of Water 2001*

sary. The exchange is a cultural, personal, professional and institutional challenge (EMCP 2004a).

Basically there are three ways of international knowledge exchange available:

**(1) Using the internet as a global knowledge database**

The world wide web could be regarded as the basis of a modern global knowledge network. But as there are some million websites online at the moment the main problem is to collect the information needed from the internet. In this context, the need for the development of information exchange tools is therefore evident. Some instruments already available are e.g. forum systems, online-databases and even online training courses. In the framework of the EMCP project a climate change related internet site is in preparation and also online training is planned.

**(2) International experts working as consultants for developing countries**

This is the "traditional" way of international exchange or technical assistance. The foreign experts can deliver their knowledge and they can ease the access to modern technologies and processes in industry as well as in the service sector.

**(3) Experts from developing countries visiting industrialised countries for knowledge exchange**

By visiting industrialised countries the experts from developing countries are able to exchange knowledge by carrying out study tours, visits, training courses abroad and cross border cooperation between institutions offer the possibility of international exchange between Pakistan and Europe.

Especially in the context of global climate change and in the context of the adaptation and mitigation measures carried out to prevent its impacts worldwide knowledge transfer is one of the most important tasks of the international community.

**3.3.2. Public Campaign****Mass media**

- CDM information introduced by Newspapers
- CDM information propagated by local and central broadcasting and television stations
- Organizing tele-communication conferences
- Organizing communication working teams
- Propagating to CDM one day per month

**Establishing National CDM Website**

- Communicating necessary information
- Propagating and providing CDM information

**3.4. Capacity building needs related to CDM project development****3.4.1. General CDM Capacity Building Needs**

In creating the institutional capacity building needs for implementation of CDM projects, there is a need to realize the rapidly changing global and domestic economic environment. The Chinese government already installed the major institutions and defined their responsibilities (see Chapter **Error! Reference source not found.**). But still some work has to be done: The financial and management rules, budget systems and work units which will enable potential CDM projects to easily attract investment need to be formulated. An important aspect is the necessity of flexible organizational arrangements that facilitate performance and support to the implementation of CDM. Therefore significant capacity building, in terms of promoting an environmental awareness, which could lead to reduction of GHGs and its investment, technical knowledge, and business skills, should be promoted. The national awareness campaign and capacity building programme should be established to disseminate CDM rules and methodologies to the private sector, NGOs, local authorities and the communities.

Overall, capacity-building services should be available across a wide range of fields necessary for the development of CDM business (see Box 7).

There is also a need to establish necessary capacity for an effective monitoring and evaluation system in all CDM projects. The effective monitoring and evaluation arrangements should be integrated to CDM project design and implementation levels. Appropriate monitoring indicators such as emissions reductions and sustainable indicators should be developed and a management information system designed that will assist tracking the progress of the CDM projects by the staff concerned (Ministry of Water 2001).

Specific capacity building needs under CDM could be further strengthened through training the staff involved. The focus should be on a participatory planning approach with on-the-job training measures. The specific training methods and approaches will be discussed in chapter 3.5.

### 3.4.2. Specific CDM related capacity building needs:

The following list is mainly related to the CDM project cycle and therefore will only be discussed shortly.

#### (1) Develop eligible CDM portfolio

This would involve developing national projects, which meet CDM criteria developed by the national CDM institutions.

#### (2) Monitoring and evaluation

CDM projects will have to be monitored for compliance to ensure that they reach the envisaged CO<sub>2</sub> emission reductions. Therefore the host country stakeholders have to be trained in monitoring and evaluation techniques.

#### (3) Establishment of baselines

The determination of the CDM project baseline representing the case of the project not having taken place is of greatest importance for any CDM project (as discussed in Chapter **Error! Reference source not found.**). There is need to build capacity in measurement and other data collection techniques regarding establishment of the baseline situation.

#### (4) Certification and verification

Though a certification company will do certification, there is need for a technical know-how of the certification and verification process at the local level.

These are only some examples for the capacities that have to be built by CDM training. The structure, the components and potential target groups of a successful CDM training will be discussed in the next section.

## 3.5. CDM Training

In the framework of the EMCP project a *Manual on Capacity Building and Training Management for Local Initiatives* is currently being prepared (EMCP 2004b). This manual will deliver a very detailed practical approach for the preparation and performance of training measures. Here we will concentrate on some specific CDM related aspects like the choice of target groups (see 3.5.3) or the evaluation of training measures to guarantee their sustainability in the future (see 3.5.5).

### 3.5.1. Train-the-trainers measures

To guarantee the sustainability of training measures for climate change policy support the training of potential trainers is very important. Only when there is an available pool of trained experts which are able to disseminate the CDM training contents to other participants the continuity of the knowledge spread out in the country is possible over a longer period.

Therefore it is absolutely necessary to implement train-the-trainers measures.

Some general requirements for trainer candidates from EMCP (2004a): They should

- be actively involved in an organisation, community, NGO, consultancy, working on environmental-, quality- and/or security management.
- have experience in the field of environmental training.
- be well informed about their organisation and be prepared to explain its activities to other participants.
- be in the position to act as a trainer after the course.
- be committed to attend for the full duration of the course.
- be supported by a sending organisation.

#### Box 8: Proposed CDM training structure

##### Theoretical Training

Module 1: "What is the CDM about?"

Module 2: "What is an eligible CDM project?"

Module 3: "What is the significance for my country?"

##### On-the-job Training

Module 4: Study Tours

Module 5: Site Visits

Module 6: Carrying out of practical CDM projects

Provided that the trained trainers meet these requirements the training courses suggested in the next chapter could be implemented successfully.

### 3.5.2. CDM training course design

The following CDM training course was designed by INTEGRATION and could be used as a basis for different training needs.

#### (1) The training in general

In addition to addressing the global problem of climate change in a cost-effective manner, CDM offers significant benefits to both the investing and the host parties. Benefits to the host parties include financial and technological inputs, capacity-building, local environmental benefits and indirect benefits such as employment generation and international contacts. The main target should be to prepare the CDM host country stakeholders for the upcoming international Emission Trading Regime of the Kyoto Protocol. To reach these targets, a combination of seminar training and training on the job is needed:

1. The **seminar training** will enable the participants to assess the quality and operability of a CDM project (Module 1-3).
2. The **on the job training** will show the participants the practical steps towards a successful implemented CDM project by carrying out a feasibility study for a proposed CDM project (Module 4-6).

The participants will be guided through the entire CDM Project Cycle in a step-by-step approach.

For each step of the CDM Project Cycle the participants of the Training course will be informed about the CDM Institutional Framework and the eligibility criteria for participation in CDM.

The problems to be addressed can be summarized as follows:

- Lack of climate change awareness in the public and the private sector
- Lack of linkages to the international accreditation system
- Lack of ability to identify, design and implement CDM projects

After taking part in the CDM training the participants will be able to decide whether a proposed CDM Project corresponds with this basis as well as with the national sustainability criteria each project has to fulfil.

#### (2) CDM Training - Structure

The training structure (see Box 8) is guided by the CDM project cycle as presented in Part I of this paper (which is published separately) and is trying to answer the above mentioned question (Module 1-3). In addition it offers the practical guidance for the ability of the participants to de-

velop a CDM project from the beginning to the end (Module 4-6).

#### *Theoretical Training - Module 1-3*

##### **Module 1: "What is the CDM about?"**

###### *History of climate change negotiations*

Short overview of the past and ongoing negotiations on climate change to introduce the participants to the complex and often confusing rules of the Kyoto regime.

###### *The Kyoto Protocol*

The Kyoto Protocol combines a system of rigid quantity targets for individual country emissions of GHGs and tight deadlines for those emission reductions, with flexibility provided to each country with respect to the manner in which it chooses to meet its emission targets.

###### *Basis of the CDM*

Most CDM projects are anticipated to take the form of international investments in emission reduction projects, with private entities being the principal investors. CDM investments are expected to be "additions" to existing or planned projects rather than the sole medium for basic project financing. Thus, an investor would expect to earn a higher return from his investment through the crediting of CERs than without them.

###### *CDM Project activities*

Here the above-mentioned CDM Project Cycle will be presented to the CDM training participants.

##### **Module 2: "What is an eligible CDM project?"**

###### *Eligible Types of CDM-Project*

After the CDM training, the stakeholders will be able to assess whether a CDM Project meets the UNFCCC requirements:

- The host party confirms whether a CDM Project will assist it in achieving sustainable development
- Equitable geographic distribution
- CDM activities should lead to the transfer of environmentally safe and sound technology and know-how

Additionally, information on the CDM "Gold Standard" of the WWF will be given to the participants with the aim to for instance facilitate negotiations with NGOs.

###### *Small Scale CDM Projects*

This section deals with the definitions and rules for small scale projects:

- Bundling of project activities

- Requirements for the project design document
- Simplified baseline methodologies and monitoring plans
- Information on the different types of eligible small scale CDM projects will be given to the participants.

*Baseline determination*

The baseline can be defined as the reference development which hypothetically would have occurred, had there been no project.

Participants will be trained in using the different baseline methodologies for differing project types and in bringing them into line with the host country's national priorities.

**Module 3: "What is the significance for my country?"**

*CDM-Design Models:*

Information on the different models (e.g., unilateral, bilateral and multilateral) will be presented.

*CDM-Criteria for the Host Country*

According to each country's requirements, eligibility and sustainability criteria for CDM projects will be developed and designed in small workshops.

*Tasks for the stakeholder*

Each different stakeholder will be trained on his specific needs and tasks concerning the implementation of CDM projects.

**On-the-job Training - Module 4-6**

**Training Module 4: Study Tours**

During these study tours the participants will receive information on foreign CDM-institutions, project design and implementation as well as governmental and investor related information from industrialised countries.



*Chinese CDM Study Tour in Germany / Switzerland*

**Training Module 5: Site Visits**

Site visits in the host country as well as abroad will help the participants to identify and implement CDM projects in their home country.



*Site visit at Tri-Generation station in Berlin*

**Training Module 6: On the Job Training by CDM Pilot Projects**

The final step in the CDM training is the development and design of a pilot CDM project. Here the participants will use the project cycle steps which they were trained in during the first three sections of the CDM training. The participants will then be able to develop this pilot CDM project on a "learning-by-doing" basis.



*Seminar in wind-blade production site in Sachsen / Germany*

**(3) Educational Principles**

The training programme and its individual sections are based on the following principles:

- Learning by doing wherever feasible and useful.
- Direct application of learned skills throughout the course.

**Box 9: Definition**

**Training Needs Assessment (TNA)** is a systematic procedure to diagnose changing work requirements and to develop the adequate training responses to the needs of the target groups. TNA is a critical element in the training process.

- Use of real examples, plans and cases.
- The approach proceeds from the specific to the general, i.e. from the local to the provincial level, making the understanding of interlinkages between the different levels more easy.
- The training reflects the way complex subjects are learnt. A combination of analytic and comprehensive learning processes is needed and visualisation plays a major role throughout the training.
- The training units are separated by time buffers. The inclusion of additional topics or further clarifications is thus possible.
- Avoidance of frequent fluctuation within the training faculty by formation of a permanently available team of trainers. This will also facilitate establishment of personal relationships between trainees and trainers.
- Monitoring and evaluation by the participants mostly on a weekly basis and a concluding evaluation session at the very end of the training.

Since each training has to be adapted to the specific needs of the trainees and the characteristics of their home country, the offered training sections are only structured suggestions which have to be modified and enriched with additional ideas, visits and activities.

### 3.5.3. CDM training needs assessment

Training needs assessment (TNA, see Box 9) of an organisation includes: scanning the targeted environment for data and information about needs and analysing the data to determine if training is the right remedy for dealing with performance discrepancies that were prompted to assess the training needs.

TNA takes place in three phases. The first phase, **preparation**, is concerned with organising the process and including all important stakeholders, the second phase, **scanning**, is concerned with gathering data on what is going on in the work environment that might suggest the need for training. The third phase, **data analysis**, involves a review of the data gathered to determine if training is the right remedy for what is wrong or if some action not related to skill, improvement is more appropriate.

Needs assessment should support the local project planning, development and implementation. It is intended as a qualitative guide for institutions and individuals in comparing existing perform-

ance with the ideal, in order to plan training programmes. The TNA is a process in the training and project cycle and has to be updated periodically based on evolving needs and trends.

Training should not be confused with pre-service education. Training is not education. The distinction is important when considering how to employ the training needs assessment process. Training is concerned with the competency of people who already are part of the workforce, education is concerned with providing a knowledge base and thinking capacity needed by men and women to be productive members of the workforce at some future time.

Training is designed to produce competent behaviour that will result in accomplishments that have value for society and its institutions. But, training is expensive. There seldom are enough resources to meet every training need. However, the consequences of not training are far more expensive than the costs of training in terms of failure to develop the potential of a country's human capital. Training needs assessment, based on an identification of critical competencies, can bring both rigour and direction to training investments (EMCP 2004b).

### 3.5.4. Target groups and their detailed competence strengthening needs

Although a TNA will assure that the training content will most likely meet the target groups requirements, it does not assure that the right training course matches with the appropriate candidates and that the training contents matches with the practical needs of real participants. Addressing the candidates and their selection is one of the main concerns of each training management.

#### (1) Develop a target group profile

A target group profile is a guide in the Training Development Process. The trainer (or assessment team) should develop a profile of the learning group in terms of age range, educational background, length of time on the job, job responsibilities, and similar factors. This information is helpful to the trainer in making decisions about such things as training content, methods, scheduling, selection of participants, location of training, or size of the group.

### **3.5.5. Multi-level evaluation and quality assurance**

#### **(1) Evaluation of Training Measures**

The aim of this evaluation is to find out whether the objectives CDM Training are met. Additionally, it helps us to continuously improve the quality and the relevance of the training measures. Generally, opinions and statements concerning the quality and effects of the training courses are acquired through questionnaires at the end of the course and modules. General questionnaires, i.e. not specific to the type of training module, ensure standardized evaluation criteria. Additionally, informal measures such as boxes to collect complaints and suggestion for improvement might be used.

A follow-up of the training and the offer of further assistance is part of our dedication and responsibility. It helps to assure not only more effective guidance of the participants after their return, but also to use middle term impacts of the training to constantly improve our course offer.

#### **Evaluation Levels**

- Participants evaluate the trainer, training module and the training environment on completion of each training course (P-T-Evaluation). This evaluation is obligatory.
- Trainer evaluates each participant on completion of each training course (T-P-Evaluation). This evaluation is to be performed whenever possible, (i.e. if one trainer gets to know the participants for a longer period, for instance in training courses abroad)
- Institutions evaluate the impact of the training module on the institute (I-P-Evaluation). This evaluation could be done as soon as the HRDP reaches a higher organisational level.

## 4. Abbreviations

AAU	Assigned Amount Units from Emission Trading
Annex I Countries	Countries that signed the FCCC: OECD, Russia, Eastern Europe Countries, Turkey
Annex B Countries	Countries that signed the KP: Annex I Countries without Turkey and Belarus
AIJ	Activities implemented jointly: JI and CDM projects of the pilot period from 1997 to 2000
BAU	Business as Usual
CDM	Clean development mechanism
CER	Certified Emissions Reductions from CDM projects
COP	Conference of the Parties
DC	Developing Country ("non Annex B Country")
EB	Executive Board for the CDM
EIT	Economy in Transition: Countries that are undergoing the process of transition to a market economy
ER	Emission Reduction
ERU	Emission Reduction Units from JI projects
ET	Emission Trading
FCCC	Framework Convention on Climate Change
GHG	Greenhouse Gases
IC	Industrialized Countries
IPCC	International Panel on Climate Change
JI	Joint-Implementation
KP	Kyoto-Protocol
LULUCF	Land Use, Land Use Change and Forestry
NSSD	National Strategies for Sustainable Development
PCF	Prototype Carbon Fund of the Worldbank
OECD	Organisation for Economic Co-operation and Development
QELROs	Quantified Emissions Limitation and Reduction Objectives
RE	Renewable Energy
Sinks	Carbon reservoirs which can bound CO <sub>2</sub> for a time, e.g. forests or soil
SSC	Small Scale CDM Projects
UG	Umbrella-Group: Group of Annex B Countries – Australia, Iceland, Japan, Canada, New Zealand, Norway, Russia, Ukraine, and USA

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## 6. Glossary<sup>9</sup>

**Adaptation** (to climate change): means the realisation of measures to prevent the impacts of e.g. sea level rise or floods.

**Adaptive capacity:** is the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences.

**Additionality:** The issue of whether greenhouse gas emissions reduction or sequestration in a CDM (or JI) project occurs over and above the baseline and constitutes a new reduction that would not have otherwise occurred without the existence of the project. There are several distinct forms of additionality:

- Financial additionality: a project does not use ODA (Official Development Assistance) or GEF funds.
- Economic/investment additionality: the project is not profitable taking into account risks and non-monetary barriers. There are differing views how to determine economic/investment additionality in quantitative terms.
- Environmental additionality: the project reduces emissions.

**Assigned amount unit (AAU):** a unit issued pursuant to the relevant provisions in the annex to decision -/CMP.1 (Modalities for the accounting of assigned amounts) and is equal to one metric tonne of carbon dioxide equivalent, calculated using global warming potentials defined by decision 2/CP.3 or as subsequently revised in accordance with Article 5;

**Certified emission reduction (CER):** a unit issued pursuant to Article 12 and requirements there under, as well as the relevant provisions in these modalities and procedures, and is equal to one metric tonne of carbon dioxide equivalent, calculated using global warming potentials defined by decision 2/CP.3 or as subsequently revised in accordance with Article 5;

**Emission reduction unit (ERU):** a unit issued pursuant to the relevant provisions in the annex to decision -/CMP.1 (Modalities for the accounting of assigned amounts) and is equal to one metric tonne of carbon dioxide equivalent, calculated using global warming potentials defined by decision 2/CP.3 or as subsequently revised in accordance with Article 5;

**Leakage:** Indirect effects of emission reduction projects or policies that lead to a rise in emissions elsewhere. E.g. fossil fuel substitution leads to a decline in fuel prices and a rise in fuel use elsewhere. In the case of CDM projects in both forestry and energy sectors, leakage can be a result of unexpected effects including unforeseen circumstances, improperly defined baseline, improperly defined project lifetime or project boundaries, and inappropriate project design.

**Mitigation** means the reduction of GHG emissions from different sources (e.g. industry, traffic, households, agriculture).

**Removal unit (RMU):** a unit issued pursuant to the relevant provisions in the annex to decision -/CMP.1 (Modalities for the accounting of assigned amounts) and is equal to one metric tonne of carbon dioxide equivalent, calculated using global warming potentials defined by decision 2/CP.3 or as subsequently revised in accordance with Article 5;

**Sensitivity:** The degree to which a system is affected, either adversely or beneficially, by climate-related stimuli. Climate-related stimuli encompass all the elements of climate change, including mean climate characteristics, climate variability, and the frequency and magnitude of extremes. The effect may be direct (e.g., a change in crop yield in response to a change in the mean, range, or variability of temperature) or indirect (e.g., damages caused by an increase in the frequency of coastal flooding due to sea-level rise).

**Stakeholders:** Means the public, including individuals, groups or communities affected, or likely to be affected, by the proposed clean development mechanism project activity.

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<sup>9</sup> Please note: This glossary is not trying to be complete. It just is giving some explanations for some terms not so common used in this paper. Further very useful climate change related glossaries can be found in the following papers: 149, 362.

**Vulnerability:** The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity.