

INTERNATIONAL FINANCIAL MECHANISM IN CLIMATE CHANGE MITIGATION AND ADAPTATION

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Abstract-This paper deals with international financial mechanism on climate change mitigation. It outlines the role of multilateral financial institutions with reference to global environmental facility. World Bank, African development Bank, Asian Development Bank, The European Bank for reconstruction and development and the Inter American Development Bank in climate change mitigation financing. This paper makes a special note on private financing sources and other funding agencies in climate change mitigation. This paper concludes with some interesting findings.

Introduction

The Intergovernmental Panel on Climate Change (IPCC, 2007) and the Stern Review (Stern, 2006) pointed out that investments in climate change mitigation are well below the likely costs incurred by taking no action to combat climate change. The United Nations Framework Convention on Climate Change (UNFCCC) has estimated that global additional investment and financial flows of US\$ 200–210 billion annually will be necessary by 2030 to return global greenhouse gas (GHG) emissions to current levels. This estimate includes mitigation and adaptation actions in both developed and developing countries.

At the United Nations Climate Change Conference in Copenhagen in 2009, government leaders from developed and developing nations expressed strong political will to urgently combat climate change in accordance with the principle of common but differentiated responsibilities and respective capabilities. It was emphasised that scaled-up, new and additional, predictable and adequate funding, as well as improved access to financing, was needed for the developing countries. United Nations (2010) notes that meaningful mitigation actions and transparency on implementation, developed countries committed themselves to a goal of jointly mobilising an additional US\$100 billion a year by 2020 to address the needs of developing countries.

Current Status of Climate Change Finance

In recent international negotiations related to climate change mitigation the participants have agreed that there is a need to improve understanding, transparency and accountability about greenhouse gas mitigation actions and to improve the financial and technical support for mitigation. As per the report by OECD/IEA (2009) there is general agreement among Parties that increased efforts need to be devoted to measurement reporting and verification of mitigation activities, the responsibilities for assembling and reporting information on mitigation financing and mitigation actions and results have not been clearly defined and data on mitigation support from developed to developing nations are not readily available.

The UNFCCC National Communications currently serve as the main reporting mechanism for tracking progress in mitigation support. However, this framework has a number of weaknesses that limit its value for assessing the level of mitigation financing for developing countries. These include incomplete and infrequent reporting, data gaps and inconsistencies, lack of sufficient detail, and lack of data on private financing.

Multilateral Financing Sources

Multilateral financing sources include multilateral development banks, special international agencies created by these MDBs such as the Global Environment Facility in collaboration with various national governments, and multilateral funds. Together, these are referred to in this guidebook as multilateral financial institutions or multilateral financing institutions. The multilateral financing institutions have multiple governing members, including those from borrowing developing countries and developed donor countries. Multilateral financing institutions raise funds from a variety of sources, including capitalisation from governments and borrowing programmes, as well as income from loans. Multilateral financing institutions provide financial support and technical assistance for economic and social development activities in developing countries.

This section provides an overview of international agencies, followed by multilateral development banks and the special funds. The two major international agencies providing financing for climate change mitigation actions are the United Nations (UN) and the Global Environment Facility (GEF), which was created as the financing arm of the United Nations Framework Convention for Climate Change (UNFCCC). Various agencies of the UN are active in mitigation financing. These include the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP), the United Nations Foundation (UNF), and the Food and Agriculture Organization of the United Nations (FAO). These agencies have created a number of special funds. One example of the UN initiative in support of climate change mitigation actions in developing countries is the UN-REDD Programme and it is called Reduced Emissions from Deforestation and Forest Degradation jointly implemented by the UNDP, UNEP, and the FAO.

The Global Environment Facility (GEF)

Global environment facility was established in 1991 and has the longest track record of financing climate change mitigation and adaptation programmes and projects. The global environment facility partnership includes ten agencies:

1. UNDP
 2. UNEP
 3. The World Bank
 4. Food and Agriculture Organization of the United Nations
 5. United Nations Industrial Development Organisation
 6. African Development Bank
 7. Asian Development Bank
 8. European Bank for Reconstruction and Development
 9. Inter-American Development Bank
 10. International Fund for Agricultural Development
- In the current cycle, the global environment facility has the following major focal areas

1. Climate change (mitigation and adaptation)
2. Biodiversity
3. Chemicals
4. International waters
5. Land degradation
6. Sustainable forest management
7. Ozone layer depletion.

Multilateral Financial Institutions

The World Bank

The World Bank is by far the most important among the MFIs. The core mission of the World Bank is to support economic development and reduce poverty while recognising the added costs and risks of climate change and the evolving global climate policy. The World Bank comprises 187 member countries, who are represented by a Board of Governors that act as the ultimate policymakers. Generally, the governors are member countries' Ministers of Finance or Ministers of Development. The Board of Governors of the World Bank has made a commitment to making an effective response to climate change that encompasses both mitigation and adaptation. Consistent with this commitment the World Bank has developed a strategy to help developing countries undertake nationally appropriate mitigation actions in the context of sustainable development without compromising economic growth, by facilitating and managing finance and technology transfer from developed countries.

The World Bank provides low-interest loans, interest-free credits, and grants to developing countries. These support a wide array of investments in such areas as education, health, public administration, infrastructure, financial and private sector development, agriculture, and environmental and natural resource management. Some of the programmes and projects are co-financed with governments, other multilateral institutions, commercial banks, export credit agencies, and private sector investors. In the last several years the World Bank has substantially increased its lending for climate change mitigation activities. The Bank acts as an implementing agent for a number of global environment facility projects wherein it combines global environment facility grants with sovereign loans to scale up funding support for climate change mitigation activities. In 2008, under the UNFCCC's Bali Action Plan (UNFCCC, 2008), the World Bank agreed to the creation of the Climate Investment Funds, a pair of international investment instruments designed to provide scaled-up funding to help developing countries in their efforts to mitigate rises in greenhouse gas (GHG) emissions and to adapt to climate change. These funds are discussed further below.

The World Bank has also been very active in carbon finance. A number of carbon funds were established by the Bank and the new Carbon Partnership Facility (CPF) has now been created. These carbon funds and the CPF are further discussed later in this report. Other mitigation financing facilities managed by the World Bank include the management of a number of special climate funds and the issuance of 'green bonds' to support climate change mitigation activities.

Other Multilateral Development Banks

These include the four major regional development banks, described briefly below.

The African Development Bank

The African Development Bank (AfDB) was established in 1964 to help reduce poverty, improve living conditions for people living in Africa, mobilise resources for the continent's economic and social development and provide policy advice and technical assistance to support development efforts. With these objectives in mind, the Bank aims to assist African countries (individually and collectively) in their efforts to achieve sustainable economic development and social progress. Its shareholders include African country members and 24 non-African country members. The African Development Bank has recognised that, while combating poverty is at the heart of the continent's efforts to attain sustainable economic growth, tackling climate change issues in Africa is critical to achieving the Bank's mandate. To this end, the Bank addresses climate change as a crosscutting corporate issue and has adopted an integrated results oriented Climate Change Action Plan that permeates all its operations to address mitigation, adaptation and financing. Some of The African Development Bank activities related to climate change mitigation include the African Carbon Support Program, the Climate for Development in Africa initiative, the Congo Basin Forest Fund, and helping to establish the Climate Investment Funds.

Asian Development Bank

The Asian Development Bank (ADB) was established in 1966, as a major source of development financing for the Asia and Pacific regions. ADB, in partnership with member governments, independent specialists and other financial institutions, focuses on delivering projects that create economic and development impact. Its main mechanisms for assistance are loans, grants, policy dialogue, technical assistance, and equity investments. The Asian Development Bank is responding to the need for climate change mitigation through development of innovative policies, institutions, and investments to lead the region to a low-carbon and climate-resilient future. The Asian Development Bank plays an important role in leading the region to a green growth path through financing and innovative technologies. During the period from 2008 to 2010, The Asian Development Bank invested in more than 110 projects in over 40 countries related to climate change interventions. The Asian Development Bank strategic priorities related to climate change include:

- i. Expanding the use of clean energy
- ii. Encouraging sustainable transport and urban development
- iii. Managing land use and forests for carbon sequestration
- iv. Promoting climate-resilient development
- v. Strengthening policies, governance and capacities.

The European Bank for Reconstruction and Development

The European Bank for Reconstruction and Development (EBRD) was established in 1991. It is the largest financial investor in the region that stretches from Central Europe and the western Balkans to Central Asia. With the ability and willingness to bear risk on behalf of its clients, The European Bank for Reconstruction and Development helps its member countries to become open, market economies. The European Bank for Reconstruction and Development is owned by 65 member countries, as well as the European Union and the European Investment Bank. The European Bank for Reconstruction and Development fosters transition to market economies in countries from Central and Eastern Europe to Central Asia and North Africa.

The principal forms of direct financing provided by the The European Bank for Reconstruction and Development are: (i) loans tailored to meet the particular requirements of a project, in which the credit risk may be taken entirely by the Bank or partly syndicated to the market; (ii) equity investments of a variety of forms - when the European Bank for Reconstruction and Development takes an equity stake, it expects an appropriate return on its investment and will only take a minority position. And (iii) guarantees to help borrowers gain access to financing.

The European Bank for Reconstruction and Development is playing a major role in climate finance with 369 projects in 29 countries with total investments of €34 billion. Its investments in climate change include large-scale corporate energy efficiency, sustainable energy financing facilities through financial intermediaries, cleaner energy in the power sector, renewable energy, energy efficiency in municipal infrastructure, carbon market support, use of new global financing instruments and support of policy dialogue.

The Inter-American Development Bank

The Inter-American Development Bank (IDB) was established in 1959, and is the largest source of development financing for Latin America and the Caribbean. It has a strong commitment to achieve measurable results, increased integrity, transparency and accountability. The Inter-American Development Bank supports efforts by Latin America and Caribbean countries to reduce poverty and inequality and bring about development in a sustainable, climate-friendly way. The Inter-American Development Bank has focused its mitigation activities on reducing emissions from deforestation and forest degradation, and activities for sustainable forest management. These include implantation of the REDD+ agenda as well as implementation of the Forest Investment Program (FIP) of the Climate Investment Funds (CIF) and the Guyana REDD+ Investment Fund (GRIF). IDB also supports the mainstreaming of renewable energy and energy efficiency technologies, including energy efficiency in the water and sanitation sector, and biogas and solar technologies in sectors such as agriculture, industry, housing, and commercial buildings.

Several other banks and funds that lend to developing countries are also identified as multilateral development institutions, and are included under the broad category of Multilateral Financial Institutions (MFIs). These differ from the multilateral development bank in that they have less broad ownership and membership structure or

focus on special sectors or activities. Among these are:

- i. The European Investment Bank (EIB) and the European Commission (EC, through some dedicated funds)
- ii. The Nordic Development Fund (NDF)
- iii. Islamic Development Bank
- iv. The OPEC Fund for International Development (OPEC Fund).

A number of sub-regional banks, established for development purposes, are also classified as Multilateral Financial Institutions because they are owned by a group of countries typically borrowing members and not donors. Among these are banks such as Corporacion Andina de Fomento (CAF); Caribbean Development Bank (CDB); Central American Bank for Economic Integration (CABEI); East African Development Bank (EADB); and West African Development Bank.

While the multilateral financing institutions were originally organised to focus on economic development and poverty reduction, they are now increasingly incorporating climate change into their core lending operations. However, some of these (Islamic Development Bank, OPEC Fund, and West African Development Bank) have not engaged in climate change mitigation activities and are not discussed further in this report. Multilateral financing institutions generally provide loans to national governments for a wide range of programmes and projects under very liberal terms.

It should be noted that while most multilateral financing institutions loans are sovereign loans with repayments guaranteed by national governments, some multilateral financing institutions have also been engaged in other forms of financing,

including (i) sub-sovereign or non-sovereign guarantee loans to local, provincial or state governments (ii) programmes involving loan or credit guarantees, provided to commercial banks and financial institutions to invest in climate change mitigation projects (for example, the IFC partial risk guarantee programmes in Eastern and Central Europe), and (iii) loans and sometimes equity investments to private firms through some arms of the MFIs such as the UN Foundation's Seed Capital Assistance Facility, and the International Finance Corporation's Sustainable Energy Finance Facility

Clean Technology Fund

The principal features of the clean technology fund are:

- i. Utilising MDB capabilities to leverage private and public resources for low carbon investments
- ii. Promoting environmental and development co-benefits to demonstrate how low carbon technologies can contribute to national development goals and strategies
- iii. Providing concessional financing with a grant element tailored to cover the identifiable additional costs of the investment necessary to make the project viable.

The clean technology fund seeks to have transformational impacts by supporting investment programmes that (i) constitute a dominant part of countries' low carbon development strategies; (ii) shape the course of markets for technology deployment; and (iii) transcend GHG emissions savings objectives by providing broader development and environmental benefits. The total funding of the clean technology fund is US\$4.6 billion, and all of the pledged resources have now been committed to 15 investment programmes in large developing countries. The investment programmes have focused on renewable energy (both grid-based and off-grid), energy efficiency (in buildings, industry and agriculture), and modal shifts and efficiency improvement in transport.

Strategic Climate Fund (SCF)

The Strategic Climate Fund (SCF) is an overarching fund to support targeted programmes with dedicated funding to pilot new approaches with potential for scaled-up, transformational action aimed at a specific climate change challenge or sectoral response. The Strategic Climate Fund includes three targeted programmes: The Program on Scaling-Up Renewable Energy in Low Income Countries (SREP), the Forest Investment Program (FIP), and the Pilot Program for Climate Resilience (PPCR).

The Program on Scaling-Up Renewable Energy in Low Income Countries (SREP)

Approved in May 2009, the Scaling-Up Renewable Energy in Low Income Countries aimed at demonstrating the economic, social and environmental viability of low carbon development pathways in the energy sector by creating new economic opportunities and increasing energy access through the use of renewable energy. It focuses on renewable energy projects such as wind and solar energy, small hydropower and biomass, and geothermal energy. The programme also considers cooking and heating projects as well as sustainable forests, biogas, and other renewable based fuels. The total size of the SREP fund is US\$318 million

The principal objectives of Scaling-Up Renewable Energy in Low Income Countries are to:

- i. Serve as a model in assisting low income countries to foster a transformational change to low carbon pathways by exploiting renewable energy potential
- ii. Overcome economic and non-economic barriers to scale up private sector investments to achieve Scaling-Up Renewable Energy in Low Income Countries objectives
- iii. Highlight economic, social and environmental co-benefits of renewable energy programmes
- iv. Enable blended financing from multiple sources to enable scaling up of renewable energy programmes
- v. Facilitate knowledge sharing and exchange of international experience and lessons.

The Forest Investment Program

The Forest Investment Program (FIP) is another Strategic Climate Fund whose main objective is to initiate and facilitate transformational change in developing countries' forest related policies and practices. The programme was approved in May 2009 and the size of the fund is US\$578 million.²⁴ It is designed to support developing countries' efforts to reduce emissions from deforestation and forest degradation by providing scaled-up bridge financing for readiness reforms and public and private investments. It will finance efforts to address the underlying causes of deforestation and forest degradation and to overcome barriers that have hindered past efforts to do so.

Other Forest Investment Program objectives are to

- i. Facilitate the leveraging of additional and sustained financial resources for REDD, through a possible UNFCCC forest mechanism, leading to an effective and sustained reduction of deforestation and forest degradation, thereby enhancing the sustainable management of forests.
- ii. Pilot replicable models to generate understanding and learning of the links between the implementation of forest-related investments, policies and measures and long-term emission reductions and conservation, sustainable management of forests and the enhancement of forest carbon stocks in developing countries.

Global Energy Efficiency and Renewable Energy Fund (GEEREF)

The Global Energy Efficiency and Renewable Energy Fund (GEEREF) is a public private partnership (PPP) set up by the European Commission, Germany and Norway in 2008 to maximise the leverage of public funds.²⁵ Structured as a 'Fund-of-Funds', Global Energy Efficiency and Renewable Energy Fund invests in private equity funds that provide equity finance to small and medium-sized project developers and enterprises. The major investors in Global Energy Efficiency and Renewable Energy Fund are the EU, and the governments of Germany and Norway. The US\$169.5 million pledged to the Global Energy Efficiency and Renewable Energy Fund is administered by the European Investment Bank.

Global Energy Efficiency and Renewable Energy Fund invests exclusively in emerging markets outside the EU and particularly focuses on serving the needs of the ACP, which is a group of 79 African, Caribbean and Pacific developing countries. It also invests in Latin America, Asia and neighbouring states of the EU except for Candidate Countries. Priority is given to investment in countries with policies and regulatory frameworks on energy efficiency and renewable energy.

Global Energy Efficiency and Renewable Energy Fund focus is on:

- i. Renewable energy, including but not limited to small hydro, solar, wind, biomass and geothermal
- ii. Energy efficiency, including but not limited to waste heat recovery, energy management in buildings, cogeneration of heat and power, energy storage, and smart grids.

The Global Energy Efficiency and Renewable Energy Fund does not directly provide funding to renewable energy and energy efficiency projects or enterprises, but rather invests in private equity funds that specialise in providing equity finance to small and medium-sized project developers and enterprises (SMEs). These private funds must have a pipeline of environmentally and financially sustainable projects and must meet strict investment criteria in order to qualify for The Global Energy Efficiency and Renewable Energy Fund funding. As of 2011, funding for four commercial renewable energy investment funds in Asia, South Africa and Latin America has been approved.

Private sector investments in mitigation activities will include equity and debt financing of large mitigation projects and smaller individual projects such as energy efficiency projects in SMEs or solar water heaters in homes or hotels. Many public sector initiatives, by national governments, multilateral and bilateral financial institutions, and special climate or carbon funds, are designed to foster and promote increased foreign private investment in climate change mitigation. It should be noted that the private sector approaches climate change investments in the same manner as any other investments. However, climate change mitigation projects have certain unique characteristics that require an additional level of understanding and analysis. These include the influence of policies and regulations on the viability of an investment, such as the legal basis and durability of any subsidies, grants, tax credits, or other mechanisms that the public sector has employed to encourage investments by the private sector. Also specific public sector financing programmes that support climate change mitigation projects with initiatives such as concessional financing or risk guarantees can increase the economic and financial attractiveness of the investments, thereby providing an incentive for private sector investment in such projects.

Risk vs. Return Considerations

At the heart of every private investment decision is the basic consideration of the risk of the investment against the potential return from the investment. At the individual project level, investors are mainly motivated by the profitability of the potential investment, which is determined by whether the investment either debt or equity offers the right risk-reward ratios. The private sector is influenced in the risk-reward assessment by the underlying national and international policy and regulatory framework that will determine the value of the investment.

The major risks considered by the private sector in investments in climate change mitigation projects have been summarised as follows:

1. Technology risk – reflecting concern that a new and relatively untried technology or system may not work as expected.
2. General political risk – reflecting concern about political stability and the security of property rights in the country; along with the generally higher cost of working within unfamiliar legal systems.
3. Currency risk – reflecting concern about the loss of value of local currencies and their lower utility to an overseas investor.
4. Regulatory and policy risk – reflecting concern about the stability and certainty of the regulatory and policy environment, including the longevity of incentives available for low carbon investment and the reliability of power purchase agreements.
5. Execution risk – reflecting concern that the local project developer/firm may lack the capacity and experience to execute the project efficiently; along with the general difficulty of operating in a distant and unfamiliar country.
6. Unfamiliarity risk – reflecting the amount of time and effort it takes to understand a project of a kind that has not been undertaken by the investor before.

Public sector initiatives are designed to eliminate one or more of these risks or to increase private investment returns. For example, the introduction of a carbon tax can increase the return of projects using low-carbon technologies and decrease the return of energy production with high CO₂ emissions per unit of energy output. Regulatory initiatives such as a feed-in tariff combined with the facilitation of long-term power purchase agreements (PPAs) for renewable energy, can substantially enhance the attractiveness of investments in solar or wind energy projects by improving the level, predictability and sustainability of the cash flows from the investment. Therefore, any focus on leveraging private sector finance needs to pay attention to the balance of the private sector's assets and liabilities, and the underlying policies and regulations by which they are determined.

Types of Private Sector Financing

Before considering private financing of climate change mitigation projects, it is useful to review the different types of private financing. A developer of a climate change mitigation project for example, a grid-connected renewable energy installation can seek two types of private financing: debt and equity. Debt financing is generally provided by banks or financial institutions. Equity financing, which may be in return for an ownership stake in the project or in the company implementing the project, may be provided by private investors there may also be some equity investment available from banks/FIs and from public sector funds.

Debt Financing

Debt financing is considered less risky than equity financing, since in the case of 'failure' of the project or insolvency of the project developer, the debt providers rank ahead of equity financiers in terms of receiving any available funds. Debt financing is therefore less expensive in terms of interest costs than equity financing. Equity providers consider their investments more risky and some such providers such as venture capital funds require high returns on their investments.

Typical Debt Financing

Corporate Lending: Banks provide finance to companies to support everyday operations. An assessment is made of the company's financial strength and stability, and debt is priced accordingly. These bank facilities place few restrictions on how the company can use the funds, provided certain general conditions are met. **Project Finance or Limited Recourse Finance:** Debt is borrowed for a specific project and the amount of debt made available will be linked to the revenue the project will generate over a period of time, as this is the means to pay back the debt. This amount is then adjusted to reflect inherent risks in the production and sale of power. In the case of a problem with loan repayment, rather like a typical mortgage, the banks will establish first 'charge' or claim over the assets of a business, as described above. The first tranche of debt to get repaid from the project is usually called 'senior debt'.

Mezzanine Finance: As its name implies, this type of lending sits between the top level of senior bank debt and the equity ownership of a project or company. Mezzanine loans take more risk than senior debt because regular repayments of the mezzanine loan are made after those for senior debt; however, the risk is less than equity ownership in the company. Mezzanine loans are usually of shorter duration and more expensive for borrowers, but pays a greater return to the lender. A renewable energy project may seek mezzanine finance if the amount of bank debt it can access is insufficient: the mezzanine loan may be a cheaper way of replacing some of the additional equity that would be needed in that situation, and therefore can improve the cost of overall finance and thus the rate of return for owners. **Refinancing:** this is the case when a project or a business has already borrowed money but decides, or needs, to replace existing debt arrangements with new ones, similar to refinancing a mortgage. Reasons for refinancing include: more attractive terms becoming available in the market perhaps as lenders become more familiar with the technology, meaning more money can be borrowed against the asset; or the duration of the loan facility, in terms of loans are often structured to become more expensive over time because of the increasing risk of changes to regulation or market conditions. One of the results of the financial crisis was that banks became extremely reluctant to lend for more than 6 or 7 years, which 'forced' projects that required longer-term loans, to refinance in the future, and take the risk of the terms available at that time.

Equity Financing

Equity financing sources may include individual private investors, venture capital funds, private equity funds, pension funds and other funds such as infrastructure funds. Such investors may provide equity financing for individual projects or to the company project developer implementing the project. Depending on the type of business, the stage of development of the technology, and degree of risk associated, different types of equity investors will engage in different ways. For example:

1. Private entrepreneurs local to areas with strong renewable energy potential often engage in the more risky early development of the projects
2. Venture Capital providers will focus on 'early stage' or 'growth stage' (depending on how far from the laboratory and commercial roll out) technology companies
3. Private Equity Firms, which focus on later stage and more mature technologies or projects, and generally expect to 'exit' their investment and make their returns in a 3 to 5 year timeframe
4. Infrastructure Funds, traditionally interested in lower risk infrastructure such as roads, rail, grid and waste facilities, which have a longer term investment horizon and so expect lower returns over this period
5. Institutional Investors such as Pension Funds have an even longer time horizon and larger amounts of money to invest, with lower risk appetite.

Most equity investors will use the Internal Rate of Return (IRR) of each project as the yardstick for reaching investment decisions. IRR is used to measure and compare the profitability of investments. Equity providers will generally have an expectation of the minimum IRR they need to achieve, known as a hurdle rate. The IRR can be considered to be equivalent to the earnings in the form of an annual rate of interest from an investment.

Conclusion

It could be seen clearly from the above discussion that international funding is very essential towards climate change mitigation in developing countries. It is clear from the paper that many multilateral financial institutions play a significant role in financing climate change mitigation throughout the world. In order to support the developing countries in climate change mitigations, many private financial institutions have been emerged and they are financing climate change mitigation in developing countries.

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