Workshop on Climate Change Financing

Government of India Ministry of Finance



Jointly organized by UNDP India

&

Department of Economic Affairs, Ministry of Finance, Government of India

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Our fight against global warming could set the stage for an eco-friendly transformation of the global economy — one that spurs growth and development rather than crimps it, as many nations fear.

We have witnessed three economic transformations in the past century. First came the Industrial Revolution, then the technology revolution, then our modern era of globalization. We stand at the threshold of another great change: the age of green economics.

> BAN KI-MOON UN Secretary General

Inauguration

At the inaugural session of the conference, the welcome address was delivered by LM Vas, Additional Secretary, Department of Economic Affairs (DEA), Ministry of Finance (MOF), Government of India (GOI). LM Vas presented the objectives of the workshop, stressing the importance of building capacity within the Government of India on climate change financing in order to better understand the implications of the various proposals potentially under discussion at the international climate change negotiations for India. She, in addition, highlighted how the workshop represents an example of the reciprocal trust and the excellent working relationship that exists between GOI and UNDP.

PatriceCoeur-Bizot,UNResidentCoordinator and UNDP Resident Representative made some opening remarks that set the context for the joint workshop on Climate Change Financing by MOF and the UNDP. Also in attendance at the inauguration were Ashok Chawla, Finance Secretary, MOF, GOI and Alok Sheel, Joint Secretary, DEA, MOF, GOI.

In the context of the United Nations Framework Convention of Climate Change (UNFCCC), Conference of Parties (COP) at Copenhagen in December 2009, Patrice Coeur-Bizot emphasized the criticality of climate change as a global challenge that demanded collective action by the international community. He outlined the key role that a large country such as India could play in negotiating a deal that can produce credible results for the planet. Apart from the discussion on setting country emission targets, the other core issue is that of financing mitigation and adaptation strategies. It is important to keep abreast of the developments and have an up-to-date understanding of the different issues related to finances, mechanisms and modalities.

UNDP has always considered climate change as a development issue. Addressing climate change cannot be successful without addressing poverty issues and achieving the Millennium Development Goals (MDGs). Since the early 1990s, the UNDP has developed a high level of expertise on various aspects of climate change and has mobilized and delivered about USD 2 billion to fund cleaner energy access and efficiency in over 100 countries. It has supported countries (including India) in preparing their National Communications to UNFCCC.

Patrice Coeur-Bizot closed his comments by highlighting some elements of UNDP's partnership with the GOI on climate change issues. These include financial support to national environmental and climate change related actions, technical support to National Communication to UNFCCC, support to preparing and implementing state level climate change action plans and in the area of adaptation.

As the story of climate change unfolds in all its manifestations, it is pertinent to define the context for India even though it is apparently the third largest emitter of CO_2 worldwide. Ashok Chawla, in this regard, made an important distinction between the stock and the flow¹ of greenhouses gases (GHGs), highlighting the fact that it is the stock of gases that is posing the big challenge. India is not responsible for past

¹ Since carbon dioxide once emitted remains in the atmosphere for an estimated 100 years, current emissions are not the reason for the excess carbon dioxide in the atmosphere. About 70 per cent of the accumulated emissions from the past have come from the developed world.

emissions and has made negligible contribution to this stock. Further, even though India is one of the largest emitters in terms of total emissions, its per capita emissions are very low as it is the second most populous country in the world.

Climate change management nevertheless remains a critical component of the government's agenda for development and so do concerns regarding climate change financing. Environmental management in the future is likely to demand significant financial resources.

The questions that are raised include:

- Who will pay and how much?
- Are the resources enough given the magnitude of the problem?
- How will the money flow?
- What will be the instruments and channels?
- Will existing funds prove enough for financing mitigation and adaptation worldwide or should a new corpus be set up for the purpose?
- · Should new institutions and structures

dedicated to climate change management and financing be set up?

Governments the world over are deliberating on these questions both internally and with each other in global forums-both in intimate groups such as the G20 as well as the within more representative forums such as the UNFCCC. In order to contribute fruitfully to the UNFCCC COP at Copenhagen, policy-makers and ministerial officials in India need to be exposed to the vast body information, literature and perspectives on the issue. Climate change is a highly nuanced and sensitive subject with a unique context for each country, each region within a country, and even each community with a region. To fully appreciate, assimilate and imbibe the implications of global discussions, negotiations and decisions for India and its people, this exercise of building capacities in DEA is extremely relevant.

Alok Sheel introduced the agenda for the workshop.

Session 1

Climate Change Financing

Background, Development, Current Status and Prevalent Mechanisms

Presenter: **PRODIPTO GHOSH**, Distinguished Fellow, TERI (for profile see Annexe 1; for presentation see Annexe 2)

Discussant: NAVROZ DUBASH, Senior Fellow, Centre for Policy Research (for profile see Annexe 1)

The critical questions that arise in the climate change financing debate are: What is the quantum of financial resources required to finance adaptation and mitigation? How will these funds be generated? How will these funds be governed or managed?

QUANTUM OF CLIMATE CHANGE FINANCING

The determinants of climate change impacts and hence mitigation and adaptation requirements are diverse, variable, unstable and prone to unpredictable change. This makes it difficult to estimate overtime, exactly how much money will be required. A World Bank Study (2009) entitled, The Economics of Climate Change, estimates costs of adaptation to climate change in developing countries at USD 86-100 billion annually. The study only considers costs incurred by governments, and not those incurred by households and private sector. Further, it does not include costs of addressing extreme events (floods, drought, and cyclones) as also residual costs of climate change impacts. Hence, the cost of responding to climate change both in terms of incremental investment costs and incremental energy systems costs are enormous.

Furthermore, to pay for CO_2 reductions, even a substantive carbon tax of USD 80 per tonne of emission would in all likelihood lead to a mere 6 per cent reduction in GHG emissions. On the contrary, it could precipitate a worldwide GDP loss of over USD 4000 billion. Not only are the costs of climate change mitigation high per se, but diversion of resources to climate change financing implies a reduction of resources that can be allocated to other sectors, thus undermining development.

Internalizing the costs of mitigation and adaptation to climate change will involve significant reduction in GDP, besides leading to unfavourable changes in economic structures around the world.

SOURCES OF CLIMATE CHANGE FINANCING

The proposals for climate change financing and governance that emerge from the developed and the developing worlds are widely divergent in their approaches.

Existing development assistance is basically founded on the 'Aid' Paradigm, which does not recognize the responsibility of the fund-provider as the perpetrator of

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FIGURE 1.1: CGE Modeling results: NCAER: GHG Mitigation from Carbon Tax (Revenue positive)



FIGURE 1.2: Loss of GDP in the Carbon Tax Scenario (2010-11 to 2030-31)

the 'lack of development' in the recipient country. It provides discretion on the fund-provider on who receives the funds, how much, and in which modality. The 'development aid' approach naturally finds greater favour with developed country groups as it gives them greater elbow room and bargaining power to negotiate mitigation costs downwards.

On the contrary, in the context of climate change, UNFCCC clearly lays down that the entire climate change regime is premised on the principle of 'common but differentiated responsibility' (Article 3.1 of UNFCCC) and that 'the largest share of historical and current global emissions have originated in developed countries' (Preamble). The Convention, in no uncertain terms pins the primary onus of financing climate change relating to GHG inventories, mitigation, adaptation, technology and cooperation, on the developed world in a way that fully takes into account that economic and social

development and poverty eradication are the first and overriding priorities of the developing countries.²

The debate arises from the fact that many donor countries from the developed world already count current financing for climate change within their reported official development assistance (ODA), thus ignoring their commitment in UNFCCC 1992 not to count financing for adaptation and mitigation as ODA. Donors have argued since then that adaptation activities cannot be separated from their support for sustainable development outcomes. They argue for using existing development aid institutions, structures, instruments and funds for climate change mitigation with minor modifications.

Developing countries, on the other hand, strive to put a more rights-based system in place which will make the developed nations accept their historical responsibility in precipitating climate change and pay in more certain terms for carbon mitigation and adaptation technologies adopted in the developing world—the 'Responsibility' Paradigm.

Developing countries insist that financing adaptation commitments must remain within UNFCCC architecture, and not through parallel funds managed by the World Bank or large bilateral donor agencies.

Solutions agreed under UNFCCC should incorporate/reflect the 'Responsibility' paradigm where financial resources for climate change are additional to ODA and decision on their use are not at the discretion of the donors.³

G77 countries have proposed that a Climate Change Fund, consistent with the 1992 UNFCCC be set up. This fund would be guided and accountable to COP, which would determine its policies and priorities. This fund would have a balanced and equitable representation of all parties to the Convention. Many issues remain to be resolved in reaching an agreement with all countries represented in current climate change negotiations, including resistance to a continued role for the Global Environment Facility (GEF) in providing fiduciary oversight for such a fund.⁴

India in particular and developing countries in general are faced with an analytical challenge wherein a country such as India could embark on adoption of certain green technologies while remaining within its development policy framework but it would need to finance these domestically as the funds would be difficult to source. To do so unilaterally would dilute its argument of 'historical responsibility' and to not do it would be at the cost of climate objectives.⁵

Mitigation and adaptation commitments and negotiation for climate change financing are in this sense intimately linked for developing countries and are inseparable. It would be difficult for developing countries to commit to firm reduction goals by 2031 or 2051 as the uncertainties are enormous.⁶

FINANCING INSTRUMENTS: PUBLIC, PRIVATE, AND INNOVATIVE

Financing could be sourced from **public sources, private funds or through carbon markets**. The first has governments, development banks and NGOs building investment funds. The second seeks to supplement this essentially public financing with a commodities emissions market (and related offset programme⁷) that

² For specific Articles of UNFCCC that are relevant, please refer to Annexe 2.

³ For details on the 'Developed Country Perspective' and the 'Developing Country Perspective' please see Annexe 2.

⁴ For alternate sources of climate finance proposed see Annexe 2. Also refer to Annexe 2 for 'Issues in Monitoring, Reporting and Verification' and 'Low Carbon Growth Strategy'.

⁵ Navroz Dubash

⁶ Suman Bery

⁷ Kyoto introduced a market mechanism to help reduce emissions in both developed and developing countries. The European Union, a Kyoto proponent, launched its Emissions Trading System (ETS) in 2005, fusing an

additionally brings in private capital. Carbon markets are a part of more innovative instruments tabled which could be used to raise resources. For instance, share of proceeds on all carbon instruments (levies may vary with nature of instrument); levy of 2 per cent on capital transfers between entities in developed country parties for adaptation; additional contributions by developed countries (over and above assessed contributions), philanthropic organizations and other innovative sources, such as SDRs for sustainable development.

Carbon market finance and private investment could be leveraged by domestic policy frameworks and targeted public funds (for example, renewables portfolio standard underpinned by publicly funded feed-in tariffs). Penalties could be levied on developed countries for non-compliance with commitments under the Convention in mitigation, financing or technology transfer.

There are debates and disagreements around each of these instruments. It has been argued that, for instance, the offsets mechanism leads to the perverse outcome of reducing the cost of carbon mitigation for the developed countries. It leads to a reduction in the incentive to develop green technologies and put the global learning curve on climate change in jeopardy.⁸

Technology transfer is achieved via 'offsets'. An emitter above its cap can (in addition to buying allowances) get carbon credits by funding otherwise unfunded domestic or international mitigation projects. Credits offset emitter fines. So offsets do three things, at least in theory. They let developed nation emitters who sit above their caps pay fines in least cost ways. They fund mitigation in low income domestic areas and in developing nations. And they bring private investors to the system. The scope for developed countries to buy carbon offsets from developing countries has been viewed by the developing countries as an instrument whose essential role is to transfer responsibility for emissions reductions from developed countries (whose per capita emissions are up to six times the level of poor countries) to developing countries. It has been argued that offsetting denies the right of poor countries to develop and at the same time retards structural change designed to reduce emissions in advanced industrial countries⁹.

DEBATES ON THE PRINCIPLES OF GOVERNING CLIMATE CHANGE FINANCING

The 'Cash-for-Policy' Approach¹⁰

One of the key issues in the debate on climate change financing is that climate change financing should, in principle cover only the additional costs needed to shift from a business-as-usual scenario to a climate change friendly scenario (incremental costs). Hence, the current principle of carbon mitigation financing is based on differentiating, in a development project undertaken, between costs of development action and incremental cost of adopting, say, a carbon neutral technology.

In many cases, however, it is extremely difficult and/or extremely expensive to determine what is the incremental cost vis-à-vis the baseline cost – and the methodology used to define incrementality is often based on assumptions that are subject to criticism.

It was therefore suggested that rather than spending resources on determining the incremental costs, it could be cost-efficient to agree ex-ante on a set of actions to be undertaken, and negotiate the amount of resources needed to undertake these actions. Mitigating countries could identify policies and measures related to renewable energy,

emissions cap and market with a mechanism for flowing emissions abatement funds to developing countries.

The ETS in theory sets caps for member nations, tightens them regularly and distributes 'allowances' (for free or via auctions) to big emitters like power plants. An emitter that is above its cap can use allowances it owns or buys to offset penalties; if under its cap, an emitter can sell or save its allowances. As with any market, third party investors can bring private capital into the system.

⁸ Navroz Dubash

⁹ Navroz Dubash

¹⁰ Navroz Dubash

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solar mission, energy efficiency standards, building codes and so on which will introduce short term costs and negotiate upfront on the funds that may be generated if such policies are adopted.¹¹ This can perhaps avoid issues related to conditionality while de-linking the negotiations from historical responsibility.¹²

Perverse Incentives within the Low Carbon Growth Strategy¹³

In pushing for a low carbon growth strategy (LCGS) for developing countries,¹⁴ there is an inherent unrealistic assumption that the legal process involved in the incorporation

of LCGS is costless. LCGS, to be effective needs adopt mitigation strategies not within an isolated project-wise approach but within a policy framework that is economy wide and comprehensive. This would compound the challenge of separating development costs from incremental costs before determining the extent of climate change financing that may be required to stay on the low carbon growth path. Further, financing countries listed as the 'Annexe1' nations could seek to minimize costs by keeping the definition of incremental costs as narrow as possible consequently excluding an entire spectrum of development actions from the purview of the purported LCGS.

¹¹ This approach has however been viewed Sunita Narain as indicative of a complete write off of rights-based negotiations. It has been argued that perhaps the situation is not desperate enough to merit such cash-for-policy bargaining.

- ¹² Mukul Sanwal
- ¹³ Navroz Dubash

¹⁴ Six emerging economies—Brazil, China, India, Indonesia,Mexico, and SouthAfrica—are proactively seeking to identify opportunities and related financial, technical, and policy requirements to move towards a low carbon growth path. With the help of the Energy Sector Management Assistance Programme (ESMAP), the governments of these countries have initiated country-specific studies to assess their development goals and priorities, in conjunction with greenhouse gas (GHG) mitigation opportunities and examine the additional costs and benefits of lower carbon growth. Mitigation actions today are expected to reduce future expenditure on adaptation.

Session 2 Climate Change Financing

Rationale, Mechanisms and Instruments

Presenter: MARTIN KRAUSE, Team Leader, Climate, Environment and Energy, UNDP Regional Centre Bangkok (for profile see Annexe 1; for presentation see Annexe 3)
 Discussant: MUKUL SANWAL, Associated with South Centre, Geneva

CLIMATE CHANGE FINANCING WILL ENTAIL LARGE INVESTMENTS

The world only has 100-150 months to dramatically change its energy supply trajectory and limit temperature rise to a 'safe' 2 °C. It is in fact estimated that an increase in average temperature above 2° C would cause irreversible changes. In the absence of a significant reduction in global emissions from current levels between now and 2050, world temperatures could rise by 4°C, and possibly 6°C, by 2100. To chart a course away from dangerous climate change, huge investments are needed. According to the Stern Report 2008 mitigation activities will demand at least USD 500-600 billion per annum while adaptation measures will entail the investment of another USD 400-500 billion per annum.

Climate change should not only be perceived as a constraint to development, but also as an opportunity to change the existing growth paradigm (which is unsustainable) into a more sustainable development path (i.e. 'low carbon' or 'green economy').

Box 1: Drivers of a Green Economy

What could be the drivers to move towards a different, greener, economy?¹⁵ There are four possible drivers:

- to ensure energy security (i.e. to reduce the dependency of countries on fuel imports);
- to increase competitiveness in future markets (which would in all likelihood, increase demand for greener products);
- to secure development dividends through poverty linkages
- to preserve integrity of ecosystems to maintain their capacity to provide ecosystem services

The goal is to align human development and climate change management efforts by promoting mitigation and adaptation activities that do not slow down, but rather accelerate socio-economic progress. Successful efforts in fighting climate change will require a dramatic increase in support to developing countries for capacity development, technology transfer and investment. Addressing climate change and achieving the MDGs requires a new development paradigm that puts climate change into national strategies and plans, and that links

¹⁵ Martin Krause

policy-setting with the *financing of solutions* both in terms of mitigation¹⁶ as well as adaptation¹⁷ to climate change.

The Bali roadmap recognizes that developing countries will need *capacity development* support and *investment flows* to adopt technologies that reduce greenhouse gas emissions, while at the same time furthering socio-economic progress. This will involve massive *shifts in investment* patterns in a large range of sectors, including power generation, industry, waste management, transport, buildings, agriculture and forestry. Just as importantly, it will require a substantial increase in total investment flows to developing countries.

USING FINANCING TO REMOVE BARRIERS IN POLICY, CAPACITY, AWARENESS AND TECHNOLOGY AND REPLICATING BEST PRACTICES

Investments in the sustainable energy market have grown from USD 22 billion in 2002 to 155 billion in 2008 and could reach USD 400-500 billion by 2020. Unfortunately, only a limited number of developing countries are benefiting from these new financing opportunities to reduce climate change risks and promote economic development. Existing markets in developing countries often fail to attract investments in lower carbon and sustainable land use projects.

Climate change financing has to be accompanied by an enabling policy environment, capacity building, awareness building and technology up-gradation.

There are many examples worldwide wherein climate change financing has been used to help in bringing down policy barriers and creating capacity which have led to successful pilot projects. Financing has also helped in upscaling existing projects which have successfully implemented greener technologies.

COMBINING AND SEQUENCING FINANCING INSTRUMENTS

The sums involved in a shift to a low-carbon economy are daunting but not impossible to achieve. The international community has developed a number of public policies, public finance mechanisms and market-based instruments to shift investments from fossil fuels to more climate-friendly alternatives over the past few years¹⁸. Finance sources under the Convention and Kyoto Protocol include the GEF Trust Fund, the Special Climate Change Fund (SCCF), Least Developed Countries Fund (LDCF), Adaptation Fund and Clean Development Mechanism.

Combining and sequencing the various instruments available is as important as choosing the right instrument which in turn depends on market conditions and the stage of commercialization of the various technologies.¹⁹ Markets are not a universal panacea and other types of environmental finance (ODA, debt/ equity finance, fiscal instruments) will continue to play a role. Project developers will need to identify the best sources of funds to finance project activities (ODA, quasi-ODA, carbon trading, etc.). Even though the funds available from the various sources such as the GEF may seem extremely small for the challenge at hand, it is possible to use finances strategically to remove market barriers and enable a policy environment in which an unviable low carbon project can become an attractive low carbon project²⁰. GEF should be used to reduce risk, build skills and create the right environment. ODA and

¹⁶ Financing transition of the economy to a resource efficient economy that stays within the global carbon budget.

¹⁷ Financing for development that is climate resilient and takes the risks and uncertainties into account.

¹⁸ For a menu of financing sources across public, private, market driven and innovative sources, both at international and national and sub-national levels, see Annexe 3.

¹⁹ For the McKinsey carbon abatement cost curve see Annexe 3.

²⁰ For diagrammatic representation of suggested route see Annexe 3.

Climate Change Financing



FIGURE 2.1: Combining & Sequencing Financing

- RE pricing policy and development of RE tariff, and formulation of a national BIPV programme for 10th Malaysia Plan
- 16% Cost reduction, 1 MW installed
- Spurred the development of 129 BIPV projects with 16 different PV companies
- SURIA 1000 Programme, Malaysia's pioneering financial incentive scheme for solar energy



FIGURE 2.2: Malaysia Building Integrated Photovoltaic (BIPV) Project

carbon finance should be leveraged to remove barriers to direct investments.

Combining, sequencing and aligning financing in CDM²¹, ODA and private investments particularly from the domestic private sector will have a critical role to play.

ISSUES IN STRATEGY AND POLICY RELEVANT FOR INDIA

India and the 'Annexe 1' Countries: Points of Departure in Approach to Negotiations²²

For the 'Annexe 1' countries at the moment, **carbon management** is indeed an overriding priority because they are legally bound to cap their emissions at 1990 levels. For them it is imperative to put a price on carbon and offsets are a key element in the scheme of things.

While offsets are primarily aimed at sharing the reduction, they might end up creating cost effective options for developed countries while developing countries are deprived of their space to grow.²³

Caveat²⁴: It is important to clarify here that offsets as a concept impose a price on carbon for both purchasers (buyer's price) as well as suppliers (seller's price). Incentive effects of technology are symmetrical for both the buyer and the seller. But this is not the price of carbon that developed countries are talking about. 'Annexe 1' countries are pushing for a uniform carbon price imposed on all countries through instruments such as a carbon tax through cap and trade. This basically means that all countries would internally face a buyer's side carbon price. That is

²¹ The Clean Development Mechanism (CDM) is an arrangement under the Kyoto Protocol allowing industrialized countries with GHG reduction commitment (called 'Annexe 1' countries) to invest in ventures that reduce emissions in developing countries as an alternative to more expensive emission reductions in their own countries.

²² Mukul Sanwal

the difference between what exists now and what is sought to be imposed.

India, on the other hand, in the National Action Plan (NAP) on Climate Change is keenly concerned with shifting the development pathway. **Carbon management for India is not an overriding priority.** As India urbanizes rapidly and has to manage burgeoning demand for energy, policy priority should lie in ensuring energy efficiency rather than de-carbonizing energy in the next 20 to 30 years²⁵.

Adopting Green Technologies

De-carbonizing technology is not adequately developed; it is new and untested. These forms of technology are not viable commercially for mass scale production and transportation²⁶. For instance, Carbon Capture and Storage (CCS) as a technology especially in the context of coal is incredibly expensive and still being researched. No country has used it except in demonstration cases. **So prudence for India lies in focusing on energy efficiency for the present and waiting for these nascent technologies to mature into commercially viable options in the coming decades before opting for them.**²⁷

Paying for IPRs on Green Technology²⁸

Further, even if India were willing to adopt greener technology, it would not be prepared to pay huge premium on Intellectual Property Rights (IPRs) that these technologies entail. The technology that the world needs in order to cut emissions at the rates that the world needs to simply doesn't exist as of today. India does have access to latest technologies but there is space for

²³ Mukul Sanwal

²⁴ Prodipto Ghosh

²⁵ Mukul Sanwal

²⁶ Kapil Mohan

²⁷ Mukul Sanwal

²⁸ Query raised by Sudhakar Shukla and clarified by Martin Krause and Prodipto Ghosh.

arguing that in the context of climate change, R&D is a public good and new technologies that are being developed should be shared.²⁹ Since many IPRs are developed by the private sector, an IPR fund may be required to buy the patents.³⁰

This is not to say that developing nations want the technology to come for free. It should be possible even within a compulsory licensing regime for developing countries to invoke flexibilities which already exist in the WTO TRIPS with respect to IPRs in, say, pharmaceuticals. License fees may be governed within a regulated regime where it may be possible for a multilateral financial mechanism to buy out these technologies.³¹

Policy Stance for India

The policy lesson lies for India in proactively arguing that adaptation and technology are a public good as much as climate change is a global concern. **Any reduction in the industrial and power sector will depend on flow of technology rather than in commitments taken**. India must strive to change the framework in a way that establishes its role as a responsible country without upsetting the balance of the rights and obligations.³²

³² Mukul Sanwal

²⁹ Mukul Sanwal

³⁰ Martin Krause

³¹ Prodipto Ghosh

Session 3

Current Thinking in India on Climate Change Financing

Presenter: **JM MAUSKAR**, Additional Secretary, Ministry of Environment and Forests, Government of India (for profile see Annexe 1)

Discussant:

SUNITA NARAIN, Director, Centre for Science and Environment, Delhi (for profile see Annexe 1)

CLIMATE CHANGE MANAGEMENT IN INDIA³³

Indian agriculture is heavily dependent on monsoons for crop successes and failures year on year. Livelihoods of over 70 per cent of the country's population are agro-based. Climate change with its serious consequences of increasing the variability in monsoons, increasing temperature and rising sea-levels is an immediate threat of ominous proportions for India.

Indian NAP for Climate Change adopts largely an adaptation-based approach with optimal utilization of natural resources because mitigation technologies are very expensive and by and large the NAP does not assume substantial resource flows from international communities to help India in mitigating climate change. The two missions—the Solar Mission and the Energy Efficiency Mission—are the only mitigation components of the NAP for whom financing is envisaged, to the extent possible through domestic resources.³⁴ Forestry, which is both an adaptation measure as well as a mitigation measure, is part of the Green India Mission under the NAP for Climate Change. It is in dire need of funds that can perhaps come from the Reducing Emissions from Deforestation and Degradation (REDD) Plus.

Technologies for transitioning the energy sector to a low carbon path are still fairly nascent. Capital costs of adopting solar, nuclear or CCS are prohibitive. There is a steadily mounting pressure on rapidly developing countries such as India and China from the 'Annexe 1' countries to take on mitigation technologies in a serious way to cut emissions even though the 'Annexe 1' countries are finding it very difficult to make the transition.

Irrespective of the emission targets they take, 'Annexe 1' countries will find it extremely difficult achieve this domestically—all emission reduction proposals that have emerged from EU, Australia, or Japan reflect this point of view. They plan to reduce, not domestically but 50 to 80 per cent through offsets.

Caveat³⁵: However, even if Brazil, India and China were to reduce emissions to zero, they would not

³³ JM Mauskar

³⁴ It has been argued that the costs of the Solar Mission are staggering at INR 730,000 crore. Such costs need to be presented at the negotiations for international funding.

³⁵ Prodipto Ghosh

be able to offset what the 'Annexe 1' countries are emitting year on year.

INDIA AND CDM³⁶

India, on the whole has not benefited from CDM to the extent that it could have. Under CDM India has sought benefits for negative cost options³⁷ which it could perhaps have financed domestically. The negative and low cost options have made it cheap for 'Annexe 1' countries to extend CDM benefits to India. It would be more beneficial for India to seek CDM benefits and credits for land-based options of afforestation and carbon sequestration.

It would perhaps be wise for India not to invest domestic funds into high end options of CCS and Solar PV. Once these technologies are deployed globally bringing down the costs over the next decade or so, then India would benefit from investing in these technologies at home.

POST-COPENHAGEN³⁸

On the road from Copenhagen to Mexico, India could focus its energies on investing in and developing the low-end, low-cost, no regret options domestically, perhaps integrating these with the Nationally Appropriate Mitigation Actions (NAMAs). International flows in climate

³⁸ The entire discourse under this heading was delivered by Sunita Narain except the matter in the boxes. mitigation should be invited for land-based transitions in pastureland afforestation, degraded forest deforestation as well as costlier propositions such as Solar PVs, high penetration winds and so forth. This will maximize the benefits that India can draw from the offsets mechanism which is being sub-optimally utilized by India at present.³⁹

India should be in a position to present a strong case for a rights-based mechanism to ensure a certain per capita entitlement of atmospheric space to each human being. India needs to create space for a trading mechanism based on rights and not just markets. This will be useful for India both for the NAP as well as to maintain a balance of rights in the global environment debate.

Box 2: Public Funding for 'Low Hanging Fruit'⁴⁰

On the McKinsey Abatement Costs Curve, the no-regret negative-cost options have positive net present value (NPV) which makes them viable or investible. It may be suggested that through a strongly regulated market in carbon trading which sets stiff carbon trade targets and a high price for carbon in the form of a carbon-tax, money could be raised for public funding of negative cost mitigation actions.

Equity may be sought not just at the international level but also at the intra-national level through targeted interventions such as disaggregated off-grid applications of the solar mission to give the poor access to power.

India could argue for a mechanism that is based on a liability principle. Such a mechanism will endeavour to compensate countries for the excesses of others. India must retain its right to develop and to assure its citizens certain per capita energy availability. If this development has to be green, it has to be paid for by the bigger polluters.

³⁶ Sunita Narain

³⁷ As seen on the leftmost panel of the McKinsey Abatement Cost Curves in Annexe 3. The McKinsey abatement cost curve was originally presented in 2007, and the revised version was published in early 2009. The cost curve is a visual synthesis of its assessment of opportunities to reduce greenhouse gas emissions in order of cost. McKinsey's carbon abatement cost curve is a bar chart displaying the magnitude of potential carbon abatement by specific measures along the x-axis and the associated cost per ton of each of the displayed abatement measures along the y-axis. The measures are ranked in cost order along the x-axis such that the least costly measures appear on the left side of the chart and the most costly measures appear on the right side of the chart.

³⁹ Sunita Narain

⁴⁰ Alok Sheel

Session 4

Environment Financing Architecture

Assessment of Financing Proposals for Climate Change Adaptation

Presenter: **A DAMODARAN**, Indian Institute of Management, Bangalore (for profile see Annexe 1, for presentation see Annexe 4)

Discussant: SHIRISH SINHA, Head, Climate Change and Energy, WWF India (for profile see Annexe 1)

COMPONENTS OF THE ENVIRONMENTAL FINANCING ARCHITECTURE

Environmental financing architecture has three elements:

- 1. The first is public financing flows, which are not significant in terms of magnitude. The relative role of national and international public financing must be clearly demarcated because boundaries are often blurred by twoway flows of public finance.
- 2. Leveraging private financial resources comes next, which are also inadequate for the task at hand.
- 3. The third element is common (carbon) markets which can facilitate price discovery. Market-based instruments need to be explored further within the context of certain principles on the basis of which carbon markets need to be organized.

The central proposition advanced here is that any global climate financial architecture that recognizes the fact that mitigation and adaptation are inter-linked, the latter being conditioned by the former, has the best chance of success.

PRESSURE ON BRAZIL, INDIA AND CHINA

As per Nicholas Stern, fast growing middle income developing countries or emerging economies with higher incomes will need to take immediate action in order to stabilize and reverse emissions growth, including sectoral targets and, possibly, earlier national targets'.⁴¹ Given the strong developed country targets for carbon reduction, carbon prices can be maintained at levels which will provide incentives for both reduction at home and purchases from abroad. By putting an appropriate price on carbon, policy makers will oblige consumers and producers to face up to the full social cost of their emissions. This will ensure that there are no arbitrages.

NEW AND ADDITIONAL, PREDICTABLE, ADEQUATE AND EQUITABLE ADAPTATION FINANCING

The benchmark of an efficient and just system of financing global public goods centres on the

⁴¹ For relevant extracts of Nicholas Stern Report on Climate Change 2008, see presentation in Annexe 4. Also see the presentation for Stern on policy prescriptions and Stern on adaptations.

principle of being 'new and additional, predictable, adequate and equitable'. The principles of equity, efficiency and effectiveness defined in the context of the climate change deal by the Stern Report, can be applied to environmental financing systems as well. By additional is meant 'over and above ODA'. Where ODA has not even reached the optimal level the chances of 'additional' funds being raised are minimal.

Following Muller (2009), appropriateness of financial flow in adaptation refers to a financial measure which considers adaptation to be a historical debt of developed countries towards developing countries.⁴² India's position in the climate change forum is defined by the 'appropriateness' dimension of equity which is often greeted with cynicism.

In the Stern Report, in the context of mitigation measures, by 'effectiveness' is meant, 'cuts in GHG emissions on the required scale to keep risks at acceptable levels'. And efficient financing systems are those that have intermediation systems that do not experience delays in project cycles, provide intermediation at low transaction costs and are compatible with the needs of developing countries.

Indeed the Major Economies Forum (MEF) in its meeting of October 18-19, 2009 at London reinforced the Stern point of view, when it highlighted the 'potential role of carbon markets to deliver private sector investment in developing countries, in addition to public finance' and went on to state that 'these flows could deliver significant benefits to developing countries in terms of both on the ground investment and environmental and energy security co-benefits'.

From a developing country perspective something that is 'efficient' and 'additional' does not necessarily imply that it is also in the interests of equity.

CO-BENEFITS APPROACH TO ADAPTATION FINANCING AND EQUITY⁴³

Adaptation needs to be largely public finance driven. Field experience of IIM Bangalore in adaptation projects in the coastal zones in Kerala and semi-arid agricultural zones in Karnataka has shown that there is very little proclivity on the part of private funds to invest in adaptation projects.

An unexplored dimension of equity of adaptation financing is its inter-linkage to mitigation commitments by developed countries. The IPCC Third Assessment Report states that until 2050, global mitigation efforts that are designed to cap GHGs at 550 ppm would benefit developing countries significantly particularly when combined with enhanced adaptation. If mitigation action is concerted, it does not fall behind target and is done within national boundaries, and offsets are not talked about, then it can reduce adaptation cost considerably. Low levels of mitigation effort by developed countries besides being against the spirits of obligations in relation to the Kyoto Protocol will only serve to increase adaptation costs and 'adaptation burden' for developing countries.

Adaptation burden of developing countries is being borne at the cost of development. Required as they are to quantitatively reduce CO_2 emissions below the 1990 baseline, it is important for developed countries to take up financial commitments for funding adaptation activities in developing countries that are commensurate with their own mitigation processes. Fall in mitigation targets have to be matched by rise in adaptation financing.

⁴² For the four dimensions of equity see presentation in Annexe 4.

⁴³ A. Damodaran

PROPOSALS ON ADAPTATION FINANCING WITH UNFCCC⁴⁴

Proposals that are Linked to Mandatory Mitigation vs Those that are Not

In terms of the co-benefits criterion, the proposals can be categorized into two:

- 1. Those that are linked to mandatory mitigation and those that are not. In the former category comes the Mexican, Swiss and the Norwegian proposals, the EU ETS (European Union Emission Trading System) proposal on levy on trading, carbon market levy, levy on aviation allowance auctions, etc.
- In the latter category fall the proposals of China and G77, Bangladesh and Pakistan proposal on CDM levy and the GCSM (issue of bonds to raise finance) from UK.

In particular Norway proposes financing adaptation by auctioning emission rights for 'Annexe 1' developed countries (Assigned Amount Unit AAU). Norway also proposes that a small percentage of the value of the allocated emissions rights could go to finance adaptation, either by auctioning these rights or by a tax on their issuance. According to calculations, 2 per cent of the auctioning of the AAUs would generate between USD 15 and USD 25 billion per year. Of course, the revenue derived from the auctions would depend on the level of commitment of other countries which have a legally binding reduction target for their emissions. The higher the level of constraint, the more significant the revenues would be. By contrast, targets that are only modest will cause the prices to drop and therefore the finance capabilities as well.

While most of the adaptation financing proposals tabled during and after the Bali Action Plan, fulfil the requirements of 'new, additional, predictable and adequate' as conventionally described, the altered criteria of equity when employed to assess the different proposals places the Norwegian proposal in a favourable position.

Box 3: Innovative Instruments of Financing⁴⁵

It was suggested that innovative financing instruments such as insurance in the agricultural sector could be used more aggressively to lower the risk for farmers who are suffering drought, flooding, severe weather events to help farmers to adapt, take risks and to invest. Here is an innovative financing instrument for climate adaptation which is essentially commercial in nature, not dependent on international or domestic public money. Perhaps crop insurance as an instrument ought to be deployed much more than it currently is.⁴⁶

In the vulnerable islands in the eastern part of India, when a lot of WWF's effort in building capacities of the communities through adaptation interventions was lost post cyclones, microfinance as one of the tools to build back capacities to deal with extreme events proved useful. So there is a need to look at various instruments which do not necessarily involve large additional costs but deliver the needed outcomes.⁴⁷

These proposals highlight the differentiation between financing for adaptation and financing for mitigation given that financing for mitigation is more readily available and easier to access than financing for adaptation. At present the debate on raising adaptation funding is revolving around a levy of 2 per cent or 3 to 5 per cent on CDM products for adaptation funding. Since certified emission reductions (CERs) are issued for emission reductions from CDM project activities,⁴⁸ it raises the question: who is going to take the hit on

⁴⁸ Two special types of CERs called temporary certified emission reduction (tCERs) and long-term certified emission reductions (lCERs) are issued for emission removals from afforestation and reforestation CDM projects.

⁴⁴ For classification of financing proposals that have come before UNFCCC, please see Annexe 4. Norway's proposal was seen to be progressive in its approach.

⁴⁵ Shirish Sinha

⁴⁶ Martin Krause

⁴⁷ Shirish Sinha

a levy on CDM products and what is the revenue realization of a country which is selling CERs?

Problems of Predictability

In order to use levies from mitigation to fund adaptation, it needs to be predictable-one of the maxims of environmental financing is its predictability. However, in reality it is not predictable because of the swings in prices. In a financial derivatives sector, or a commodity derivatives sector, prices are allowed to fluctuate within a narrow band with a positional limit. But, in order to attract business and ensure that carbon markets are a big success, one would want the volumes to come in, for speculators to enter the market. This is likely to result in volatility and as a result the speculative capital moves. Unfortunately, carbon markets have not yet matured to the level of getting a positional limit within a narrow band for fluctuations. Hence the unpredictability persists.

Taxing Carbon Footprint

Article XX of the GATT seeks to discriminate commodities and manufactured goods with high carbon footprint through suitable adjustments in border taxes. High and low carbon footprint can be established through monitoring and verification. If Article XX is read with the national treatment clause of the WTO and the tariff lines are properly covered, it is not challengeable by WTO. The questions that are raised are:

- Would the Article XX of the GATT/WTO allow an exception on the world trade rules for products that have a lower content of CO₂?
- Wouldn't a different tax regime for low carbon products incur sanctions under the Article XX of the GATT/WTO?

TOWARDS EQUITABLE CARBON MARKETS

Rather than shy away from the fact that carbon markets are not in the interests of the developing countries, it is high time we talked about carbon markets that do not promote substitution of mandatory mitigation with offsetting efforts.⁴⁹ Offsetting should not become the rule for the carbon market because this will violate the equity premises of the FCCC and the Kyoto Protocol.

Secondly carbon markets should ensure a fair marketing system for sellers from developing countries, by ensuring price realization that is fair. The Stern Report avers that mitigation costs are minimal when undertaken in developing countries. However if the shadow costs of mitigation are incorporated that adjust upwards low nominal wages and capital costs of mitigation projects, the cost figures will be higher. Unless mitigation permits from developing countries are able to realize their 'real values', a carbon market cannot be considered equitable.⁵⁰

Carbon markets that facilitate sourcing of adaptation funding from mandatory mitigation activities function should form an important segment in the post 2012 financing architecture for climate change. This can be achieved if governments in developed countries can generate revenues by auctioning larger chunks of allowances than give it away for free, motivated by political considerations. Despite the lessons from the price crash due to

⁴⁹ It has been argued by Ajay Mathur in Session 5 that industry is naturally reluctant to adopt newer products unless they are proven in the market to be successful. In this context what CDM does is to convince the technology recipient that the said technology is tried and tested and is, say, 60 per cent to 80 per cent efficient. This engages the attention of the entrepreneur who may be willing to try out the new technology provided he is able to raise enough revenue through the sale of carbon credits. The monetization of the carbon emission reductions is a useful thing for the acceleration for the adoption of greener technologies.

⁵⁰ For greater details of proposed equitable carbon markets see Annexe 4.

over allocation in Phase 1 (2005-07), there has been an excess supply of 61 million allowances in Phase II of EU ETS (2008-12). Carbon markets are not matured because the signals that the markets receive are not matured.⁵¹ Given the distortions in the carbon market with the substantial price differential between the primary CER prices and the secondary CER prices, as of today no carbon market is going to get a good price for the CER realization.

Hence funds for adaptation financing have to come from mitigation action and should no longer be just restricted to CERs. The major proposition advanced here is that carbon general and financing in adaptation financing in particular need to be situated within the matrix of co-benefits approach that is premised on mandatory mitigation action. A co-benefits approach to the issue of adaptation financing is equitable and economically efficient.

CIVIL SOCIETY ORGANIZATION PERSPECTIVE ON FINANCING ADAPTATION52

The critical issues related to financing for adaptation from the civil society organization perspective are:

- What should be the level of annual financing that should go for adaptation? UNFCCC places adaptation funding requirements to be in the range of \$28-67 billion a year (Muller 2008) along with 5 billion dollars per year for insurance-critical both from the perspective of risk free reduction as well as developing technologies needed for adaptation.
- Where do small scale projects figure in adaptation financing? The current financial mechanisms do not take into account small scale options.
- What is the environment of governance of adaptation financing? A climate facility should be managed and looked after within the CCC with a very balanced representation from industrialized as well as the developing countries. The facility must extend support to LDCs when they prepare the national adaptation plans.
- How is vulnerability to be defined and measured?

⁵¹ Ambuj Sagar

⁵² Shirish Sinha

Session 5

Energy, Technology, and Climate

Presenter: AJAY MATHUR, DG, Bureau for Energy Efficiency, Ministry of Power, Government of India (for profile see Annexe 1, for presentation see Annexe 5)
 Discussant: AMBUJ SAGAR, IIT Delhi (for profile see Annexe 1)

THE ENERGY-TECHNOLOGY-CLIMATE TRIAD⁵³

Energy efficiencies are directly linked to technologies adopted in a country for the production and transportation of this energy. The choice of technology has immediate consequences for the GHG emissions of the country which is attempting to provide energy services to its people at affordable prices. In this sense energy, technology and climate are closely interlinked. **The dilemma that faces the world is that the technology that is cheap and efficient is rarely carbon neutral and the technologies that can lead to serious reductions in GHG emissions such as CCS are new, expensive and often experimental.**

India is poised at a point in history wherein two-thirds of infrastructure, equipment and appliances that would be present in 2030 are yet to be built. If this infrastructure is chosen right, we could progressively shift to technologies in renewable energy which are more efficient and yet enable us to cut back on GHG emissions. Along with increasing energy efficiency and focusing on technology in renewables, India may focus on afforestation and reforestation towards carbon sequestration, prevention of landslides, production of bio-gas and regeneration of water resources.

Yet for a country which is developing rapidly and needs to reach adequate energy services to its citizens quickly, it has limited options in adopting new technologies. The problem is not one of access; India has access to cutting edge technologies across the globe. The challenge we are primarily faced with is a price challenge. If climate change is as serious a problem as the numbers tell us, then the time period within which a technology is developed to the time it is first commercialized and further to the point when it is ready for its large scale adoption in India has to be reduced significantly. As has been demonstrated in the case of CFLs and supercritical technology in generation of power, it took 20 years for the technologies to acquire the volumes, experience and design that would make them ready for mass adoption at affordable prices.

BARRIERS TO TECHNOLOGY ADOPTION⁵⁴

What are the issues with accelerated transfer of technology? These technologies are usually developed elsewhere in the world and are suited to a different socio-economicpolitical context. These technologies have to be adapted to local needs and context before they

⁵³ Ajay Mathur

Climate Change Financing



Total primary energy supply has increased from about 350 million toe in 1990 to about 580 Mtoe in 2004; an increase of about 2.2% per year



FIGURE 5.1: India – Total Primary Energy Supply

- CO2 emissions have increased at about 2.7% per year; the faster growth in emissions reflects the decreasing share of biomass
- Emissions from India account for 3% of cumulative global emissions

FIGURE 5.2: India – Carbon Dioxide Emissions

can be adopted in India. In order to be able to realize the potential of technologies in meeting the climate challenges, the technologies have to be economically and technologically appropriate for developing countries.

Barriers of Capacity

The concerns lie not just in funds or R&D but in overcoming barriers of information, infrastructure, institutional capacity and human capacity. If India were to decide tomorrow that it actually wanted to move towards high efficiency power plants, India may not have the skilled manpower in the country to make the transition quickly.⁵⁵ Some of the low cost technologies represented on the McKinsey cost curve are not penetrating fast enough because of policy barriers, regulatory barriers and information barriers. Clearly public policy has a role to play in bringing down these barriers and accelerating the process of adoption of these technologies and making them viable.

Barriers of Price

Almostalloptions to reduce in-house gas emissions are more expensive than the technologies that we have in place today. While some mitigation technologies (especially some energy efficiency technologies) can result in lower energy bills, and result in the recovery of the additional cost in a few years, large scale mitigation will lead to positive costs. In a country like India, where only 40 per cent people have access to LPG or power, access to energy is closely related to ability to pay. To impose a new technology on them which makes them pay more for the same service, essentially puts the country's development milestones at risk. Not only does power become more expensive, so do prices of steel, cement and fertilizer which are highly energy-intensive products.

Box 4: Solar PV Panels in Rural Homes: Thai vs Sri Lankan Model⁵⁶

In Thailand there was a PV project in the Northern provinces where the government made bulk purchase of solar home systems for 300,000 rural households. These were fully paid for by the government and installed on the roofs of the houses. But after one year only 20 per cent of the systems were operating. It was not a cost or finance problem. The problem lay in the fact that there was no maintenance, no repair, no skilled electrician or mechanic in the area who had the knowledge to repair and maintain those systems. **So when we talk about technology adoption, finance is a very important barrier but equally important are skills, training and capacity building.**

In a similar Solar PV project in Sri Lanka however, the government subsidized 80 per cent of the cost while 20 per cent of the cost was borne by the end-user. The end-user had a spectrum of PV suppliers to choose from with his 20 per cent. This generated healthy competition among these providers to offer best service standards to attract the consumers; costs came down and overall, the project was a success.

One of the reasons that the Thai model failed was that there were no markets at the point of the use of the product. There was no buyer, no seller, no branding and hence no pressure to maintain reputations. Not only is local skill building to manage higher end technologies important, but also at the heart of it, the presence of markets.⁵⁷

WHAT CAN INDIA DO?

Financing for green technology must not be treated as donor flows—this is an obligation under the Climate Convention. For a long term transition of developing countries to green technologies, capacity in developing countries in terms of technology, human resources and institutional capacity will have to be built. India needs to take the lead

⁵⁷ Ajay Mathur

⁵⁶ Thai model referred to by Martin Krause and Sri Lankan model mentioned by Ajay Mathur.

⁵⁵ Ambuj Sagar

in thinking about how to actually manage these finances rather than have them fall into the pattern of 'donor activity' which has not been successful in building capacity in any meaningful way.⁵⁸

India's national goals should consist of:

- Policies and regulations to reduce risk and incentivize early adoption of green technologies
- Fiscal incentives to promote clean energy

Options for India⁵⁹

So the options for India are to:

1. Adopt readily available mature green technology which focuses on energy efficiency. There are incremental costs of adopting these technologies which have to be borne. Incremental costs will fall with time as there is large scale adoption but initial costs will be large.

The costs of technology go down through R&D and through deployment. For a given technology there is a certain reduction in the cost with increased deployment; there would be somewhere between 10-20 per cent reduction for every doubling of global deployment. So, if 100 MW of solar power are deployed, in the next 100 MW, one would witness a 10 per cent reduction in cost and in the next 200 another 10 per cent and so in the next 400 by geometric progression. It is extremely important to get greater deployment in the market to reduce the cost of the technologies and that itself will make a difference in the financing flows that is needed. One must understand that there is a direct correlation between level of global deployment and costs and that has to be a part of the thinking in the negotiations. So there is a clear correlation between 'Annexe 1' actions

and the level of financing that will be needed. 60

- 2. Adaptation of existing technologies to develop products appropriate (in terms of **ability to pay, performance requirements and raw material suitability**) for India. The technology needs to be affordable, the raw materials need to be available and cheap and also the product specifications have to suit the tastes and needs of Indians. So from the menu of clean technologies available India needs to choose those that it can tweak to suit its unique set of needs within its unique set of constraints.
- 3. Research & development: Inviting research on new products, based on emerging technologies which are perfectly suited to India does not always produce the desired response. For instance, about a year ago the Ministry of Power brought out a scheme for decentralized distributed generation based on solar power stating that if anybody sets up a DDG plant based on clean technology, which is not connected to the grid, the ministry would subsidize the capital cost up to 90 per cent while the entrepreneur could recover operating costs from the proceeds from selling the power. There were no applicants who were willing to try out the idea because unlike existing options in DDG fuelled by diesel, power fuelled by solar technology would cost Rs 5 per KWH and the rural market would have no takers for power at that price. What is more suitable for rural India is biomass technology and not solar power.

Technologies that are needed in developing countries are not likely to be developed by global technology markets. **There is a need for thinking about financing R&D that is relevant to developing countries which is, outside the standard publicly financed R&D that is happening in Annexe I countries.**⁶¹

⁵⁸ Ambuj Sagar

⁵⁹ Ajay Mathur

⁶⁰ Ambuj Sagar

⁶¹ Ambuj Sagar

Climate Change Financing

4. All these options increase short term costs; how should the global burden of costs be shared? See Sessions 1 and 4 for discussion on these aspects.

National Mission on Enhanced Energy Efficiency and National Solar Mission: Alternate Financing Models⁶²

India needs to cover within domestic cost, the most cost effective mitigation options using public money to remove the kinds of barriers that prevent the negative cost options (ref: McKinsey Abatement Cost Curves) from coming into the market.⁶³ The National Mission on Enhanced Energy Efficiency is using the Rs 270 crore at its disposal to remove barriers to technology adoption.

The National Solar Mission, which pushed for very large subsidies, actually did not fly because there is a limit to how much subsidy the government could provide. Therefore what has been put out is a very interesting model in which the government buys a MW of solar power at Rs 18 per KWH along with one MW of cheap and efficient coal power (Rs 2 per KWH) and sells it as a bundle at Rs 5 per KWH. So the government was able to make the deal for selling solar power more attractive by selling cheaper coal power with it without subsidies. Such innovations give out a very strong signal to the international community that India is willing to think out of the box but there is a limit to this and if 'you want us to do much more solar power, then international support would be required'.⁶⁴

There is a need to be clear about the purpose of the Solar Mission. Is it meant to address the:

- Climate problem
- Energy problem
- Technology policy problem

One can go into solar power generation only in a limited manner because cost reductions will not occur without large increases in global deployment of the technology. So India cannot solve its energy problems with solar power. It can have gains from being a participant in global markets on solar power in the future which can be an outcome of a climate policy or a technology policy but not an energy policy.

Local Adaptation of Global Technology⁶⁵

Pan-India adaptation of a global technology to the local need gap, ability to pay and performance standards expected is a proven method for being able to gain large volumes and reduce costs. A good example would be the Nokia mobile phone which is available at Rs 1100 on a low cost platform. The handsets that range up to Rs 7000 to Rs 8000 are also on the same platform except that there are more and more features. For most technology products a platform based approach that is locally modified to suit the market it is serving is an extremely successful tool.

Tax incentives may also be used as a tool, not to make products more affordable but to signal to the retail floor the direction in which the initial market should move.⁶⁶

Tackling the Rules of the Game⁶⁷

Initially India was under international pressure to adopt supercritical technology in power generation and claim CDM benefits. By the time it was ready to launch the ultra mega power projects, the international mood had changed. The

⁶² Ambuj Sagar

⁶³ Ajay Mathur's response to Chaitanya Prasad's query on 'where India should spend its own money and where it should seek financing options in green technology options'.

⁶⁴ Ajay Mathur

⁶⁵ Ajay Mathur

⁶⁶ Question raised by one of the participants (unidentified) and clarified by Ajay Mathur.

⁶⁷ Query raised by Sudhakar Shukla and addressed by Ambuj Sagar.

pressure was now on to adopt CCS. The route to CCS is through Integrated Drying Gasification Combined Cycle (IDCC). It is well known that CCS has not been adopted by any country in the world except by way of demonstration cases. IDCC is only possible with Australian or South African coal and not Indian coal. So India has serious obstacles to adopting these technologies even if it wants to.

India must be creative in tackling these changes in the direction of international negotiations. India may offer to adopt IDCC as long as it get credits and the 'Annexe 1' countries are willing to meet the incremental costs, bear the technical risks, and come up with a technological solution that will work with Indian coal. Till such time that these solutions emerge, the 'Annexe 1' negotiators should be willing to finance India's ultra mega power projects which are based on super-critical technology and have enhanced efficiency over existing options. In this way India can put out solutions that adapt to the rules of the game without taking on the technical risks or the extra-economic costs. converge. Say, producers of biomass-based small electricity generation systems converge with potential buyers and get a sense of the performance they want and the price they want it at. The climate innovation centres could also bring together technology developers, private sector, universities and research institutions to create roadmaps to finance these green options. Once the technology is ready, policy formulators and market regulators can pitch in to make sure that the market conditions are conducive to the acceptance, success, and sustainability of the technology option.

These centres are specifically designed to take certain problems, think about barriers and put in place the processes necessary to overcome these barriers; and in the meanwhile build local capacity for the longer term. The real strength of the innovation centres approach lies in the fact that is that it goes beyond outdated and outmoded view of technology transfer.

Climate Innovation Centres⁶⁸

India has proposed a network of climate innovation centres where communities of buyers and sellers of green technologies can

⁶⁸ The CICs were mentioned by Ajay Mathur and elaborated upon later by Ambuj Sagar.

Session 6

Emerging Issues and Debates around Climate Change Financing and Implications for India

Presenter:SIMON BILLETT, Climate Policy Specialist, UNDP New York (for profile see Annexe
1, for presentation see Annexe 6)

Discussants: PREETI SONI, Head, Energy and Environment, UNDP India (for profile see Annexe 1)

MUKUL SANWAL, Associated with South Centre, Geneva (for profile see Annexe 1)

FINANCING OPTIONS THAT MAY BE PRESENTED AT COPENHAGEN⁶⁹

Financing has been included in the Bali Action Plan as one of the four 'pillars' of a post-2012 climate framework. Financial support is key for leveraging NAMAs by developing countries and meeting their requirements of adaptation, technology, and capacity building. The differing views on financial support have been debated in the form of a dedicated stream in negotiations in a specific finance contact group in UNFCCC as also the MEF, G8 and G20.

The negotiations have revolved around UNFCCC process. The two main financing challenges are:⁷⁰

• How to generate the scale of funds required?

69 Simon Billett

 70 The prominent concerns in the discussions are available in Annexe 6.

• How to manage, disburse and monitor these funds?

One significant concern is that of direct access within a country-driven approach where there is space for countries to access finances sans layers of bureaucracy and other criteria.

There have been three main negotiating sessions in the last two months (for details see Annexe 6). There were four main proposals on the management, disbursal and monitoring of funds from US, Mexico, EU and G77 proposals. Barcelona just two weeks ago began work to consolidate these four options into a single outcome for Copenhagen.

The US Proposal

The first of the major proposals, presented by the US, was endorsed by the Japanese delegation in the Barcelona session (for the US Proposal see Annexe 6). According to the US Proposal:

- All parties will be contributing to a fund (excluding least developing countries) 'in line with capabilities'. A number of developing countries' parties have expressed concern that they may end up having to commit resources rather than receiving.
- There will be an annual system through which the countries will pledge money, which would then be dispersed through grants, concessional loans private financing and so on.
- The funds would be managed through the Global Environment Facility (GEF) for capacity building and the Global Fund for Environment (GFE) which will be managed by a governing body comprised of all stakeholders and countries. This global fund will have a number of windows and will be housed by the World Bank as its trustee.
- There would be a role for bilaterals and existing channels that are enshrined in UNFCCC text. To coordinate these 3 lines of funding, there would be a matchmaker entity provisionally housed in UNFCCC Secretariat. Countries can approach this body with their needs and be matched with the appropriate funding.

The Mexican Proposal

- All countries contribute, excluding least developed countries. Instead of 'in line with capabilities', Mexico proposes that contributions be calculated through a formula which is either based on aggregate national emissions (which imply that India would have to make substantive contribution) or per capita emissions (India would, in that event have to contribute significantly less).
- As a provision, 'Annexe 1' parties could only access 50 per cent of what they put in. This would ensure that there was in fact a net north–south transfer.
- In terms of architecture COP would decide on policies, criteria and priorities.
- There would be equal representation across country groupings in the governing body.

- The Green Fund would be a multistakeholder body housed in an existing international financial institution which would use multiple windows to disburse.
- It still needs to be resolved as to which financial institution will take on this responsibility or how it will be selected and also how existing channels including the GEF would function in relation to the Green Fund.

The EU Proposal

- All countries excluding least developed countries contributing according to a formula.
- GEF will continue as the financial mechanism through which funds are dispersed under COP.
- Additional financing may be channelled through existing institutions, the UN, international financial institutions and bilateral agencies and those will not be under COP jurisdiction.
- The rationale presented is that bringing fund under COP creates added delays.
- Like the US proposal, there would be a matchmaker to help countries to access the funding that they required.
- The bilaterals in this plan have a role to play and this is reflected in the fact that the UK government would prefer using the DFID and the German government is likely to prefer GTZ rather than a big overarching structure.

The G77 Proposal

- Generation of funds is only from 'Annexe 1' parties at the rate of 1 per cent to 1.5 per cent of the 'Annexe 1' GDP. That gives a concrete figure unlike the other proposals.
- There could be some supplementation to that through levies on aviation mechanisms etc.
- All of the funding under this proposal would be under the governance of COP, which will

have a new executive board that will manage those funds.

- There is a possibility of having a trustee that will be selected through a competitive bidding process and not pre-selected through endorsement unlike the US proposal.
- Funds are almost directly disbursed from the Executive Board to National Coordinating Bodies which are responsible for nationally distributing funds. This reflects G77 preference for stronger direct access provisions.

The French Proposal (New)

- A Climate Justice Fund, which would be specifically for countries that do not benefit from market mechanisms in CDM—India, China, Brazil and Indonesia benefit very much from those mechanisms. It is yet to be seen how this fund would find favour with larger middle income economies.
- The fund would be solely for renewable energy and would be funded through a tax on international financial transactions.

AREAS OF DEBATE AND DISCUSSION AT COPENHAGEN

The pre-Copenhagen meetings in November 2009 have been able to consolidate elements of the four proposals of the US, EU, Mexico and G77 into a text that may be included in a declaration in Copenhagen.

General areas of agreement (for detailed list see Annexe 6):

- There seem to be an agreement on the need to significantly upscale the financial resources. There is a general agreement on the need to shift from project to programmatic funding.
- It seems unlikely that donors would agree to commit significant resources unless the 'architecture' (i.e. how the resources will be managed and disbursed) is agreed first.
- There seem to be a convergence on the idea of creating a new Fund with multiple

windows, governed by a multi-stakeholder panel under the COP. Bilateral transfers are, however likely to continue.⁷¹ (This aspect has been contested at the Barcelona session⁷²)

• There seems to be an agreement on the need of some kind of 'matching entity' under the UNFCCC to match the flow of resources from various channels,⁷³ even if the G77 seems cautious on that, afraid that this will add more bureaucracy and potential conditionality.⁷⁴

Areas open to debate and discussion (for detailed list see Annexe 6):

- Who should contribute and how resources should be distributed remain areas of great division.
- There is still general disagreement on where the new fund/resources should be housed, whether there should be a single or multiple trustees, and the role of COP in governing.
- In terms of generation of resources, the Russian delegation is unlikely to approve the idea of an assessed contribution, as has been their continued stand. Along the lines of the US and Mexican proposals Russia also prefers pledging on an annual basis rather than having pre-determined criteria.
- In terms of the architecture, the role of COP needs deliberation. Some countries want a powerful COP while others do not, depending on their interests.
- A key concern of developing countries is a balanced governance structure. The Adaptation Fund is a good example of what a more balanced governance structure could look like.⁷⁵
- Developed countries have shown an inclination towards systems and institutions that can maintain a high level of fiduciary standards and accountability. India, China and other big countries may agree with that but

⁷⁵ Martin Krause

⁷¹ Simon Billett

⁷² Chaitanya Prasad

⁷³ Simon Billett

⁷⁴ Chaitanya Prasad

there are many other countries which may have reservations on meeting the national institutional standards required.⁷⁶

Questions that remain unanswered:

- How will this new architecture relate to the Kyoto protocols adaptation fund?
- Is there going to be duplication?
- Will that fund be subsumed into this?

Comment⁷⁷: Proposals that have come up do not clearly show how they will cater to the requirements of the Convention. Proposals cite sources of funds as 'all countries except LDCs'. The Convention on the other hand assigns responsibility on developed country parties.

In line with the spirit of the existing convention, developing countries speak of balanced and equitable representation where all parties have the same voice to vote. This has not found favour with developed countries who propose equal representation of various groups and countries.

As far as institutional structure is concerned, the G77, China and developing countries have expressed disagreement with continuance of the existing institutions as the only source of financing as they are donor driven and conditionalities attached to fund transfers through existing FIs do not find a place in the Convention.

POSSIBLE SCENARIOS AT COPENHAGEN

- Fund generation in terms of 'who will pay, how much and on what basis?' is an extremely contentious issue. COP at Copenhagen may find it very difficult to come to a consensual agreement on these questions.
- Architecture of how the funds may be governed is comparatively less political and tentative ideas have begun to form around some kind of agreement there. But given that there is no agreement seen to be emerging on quantum of funds an agreement on how

it is to be governed may not be meaningful.

- Considering the uncertainty surrounding the possible outcomes of Copenhagen, it is likely that interim arrangements will be proposed and discussed. At the moment the proposal on the table is for a 'fast-track' financing (between USD 7.5-10.5 billion⁷⁸) to cover the period 2010-12 and to test the post-2012 financial architecture.
- It is still unclear how the governance of these resources will be ensured, even though the use of existing channels (IFIs, GEF) is likely. There is no clarity yet on what the funds will be used for.
- An important element to be taken into consideration is the fact that often 'interim arrangements' become permanent arrangements. It is shared opinion that those arrangements and their medium/long term implications be carefully assessed and negotiated before being agreed.⁷⁹

It was felt that a comprehensive legal framework is unlikely to emerge from Copenhagen to seriously bind countries to their commitments on contributing to climate change financing. In that scenario any new financing architecture or notional fund that may perhaps be agreed upon should not be greeted with excessive optimism as a major milestone. Without any agreement on actual quantum of funds (who, how and on what basis) and a legal framework to back it, a new governing mechanism may not have the capacity to produce concrete outcomes.⁸⁰

The challenge is that the US and the EU are yet to make any firm commitments to contribute. Since the US has not yet sought approval from its political apparatus, it is still some distance from making such commitments. On the other hand, the EU has made some commitment which is conditional upon contribution from the US. This may prevent the emergence of any

⁷⁶ Martin Krause

⁷⁷ Chaitanya Prasad

 $^{^{78}}$ The EU has already committed US\$ 750-3.12 billion.

⁷⁹ Martin Krause, Mukul Sanwal, Preeti Soni

⁸⁰ Martin Krause

Climate Change Financing

interim arrangement at Copenhagen⁸¹ In this context it is still to be seen how at the end of the elaborate negotiation substantial amounts of public finance would be forthcoming. The key challenge is, if by 2020 the world needs at least USD 100 billion to manage its climate challenge while the interim funds in the range of USD 10-12 billion are available. How to bridge the gap and scale up in the longer term remains an open question.⁸²

Donor countries do not want to discuss numbers (how much money is there on the table) with no architecture (how this money is to be managed and disbursed) because they do not know where their money is going. There has to be some resolution of this concern before there is substantive progress.⁸³

KEY QUESTIONS FOR INDIA

The strategic questions for the Ministry for Finance, India are:

- What are the implications for India in the long run if India becomes a contributor?
- What are the implications if there are restrictions on the money to be used for LDCs or vulnerable countries?
- If the rules of the game change, what does it mean for India down the line?
- How can India shape the rules of the game to suit its interests?⁸⁴

The proposal that the US has for using a system of multi-year replenishments would clearly allow for the amount of contributions from India to change as the years passed whereas there are other proposals for fixed contribution or no contribution from India. That also brings the question of how long is this architecture designed for? Is it going to be running for

⁸³ Simon Billett clarifying points raised by Chaitanya Prasad and Alok Sheel.

⁸⁴ Mukul Sanwal

ever or it will run till 2020 – there has been no discussion of that.⁸⁵

- Will India really be required to contribute? All the developed countries' proposals suggest 'yes' and the G77 proposals suggest 'no'— a dichotomy which is going to be very difficult to resolve.
- If India were to contribute, how would that relate to its negotiating stance of common but differentiated responsibility?
- In terms of architecture, India is seen as a country which is able to handle financing independently at a significant scale. That would favour the use of far more direct access provisions.
- It is unclear if other developing countries and smaller island states feel that way about direct access or whether they will need assistance.
- How would the balance within the G77 group play out?⁸⁶

The key issue is that all proposals lack significant detail on how the funds will be disbursed, precise government arrangements, verification and monitoring. It remains uncertain whether it is appropriate to agree to a significant new financial architecture with those details not currently available. This is reflected in the Indian supported G77 proposal to have a bidding process for more competitive selection when more details are available and when proposals can be fully compared.

- It is important for India to look at international financing mechanisms to see how they can be translated at the national as well as the local levels.
- What are the kinds of national instruments that will be used to domestically fund NAMAs? Perhaps India could develop a sectoral fund at the local or national level for addressing climate change and that could be India's contribution in the long run.

⁸¹ Chaitanya Prasad

⁸² Alok Sheel

⁸⁵ Simon Billett

⁸⁶ All these points were made by Simon Billett.

- How would the action be taken at the state, district and sub-district levels?
- If India is going to fund the NAPCC domestically what is the link between international financing coming in and national financing going to be?
- How to utilize these funds where they are actually needed? Does India focus on smaller scale projects or the larger scale? Small adaptation projects are equally important both from climate change perspective as well as from the development perspective.⁸⁷

INDIA'S ASSESSMENT OF THE PROPOSALS

The actions of developing countries are on the agenda for discussion at Copenhagen for the first time since 1992. The G77 needs to appreciate this and take a fresh look at its thinking in the last 15 years.⁸⁸ It is agreed that while the G77 proposal lays emphasis on transparency and equity the other proposals are focussing on certainty and timeliness within which the structure of the architecture may be developed. MEA can play a stronger role in analysing these proposals and their merits and come up with more proactive proposals from India⁸⁹. India may be in a position to offer more innovative solutions in areas of persisting disagreement.

- Irrespective of what emerges from the Copenhagen Summit, India could continue work on refining more innovative proposals in financing which may be presented in Mexico next year such that political compulsions do not override climate objectives of the negotiations.
- India could work on alternatives that aim at reducing uncertainties, minimizing transaction costs and safeguarding against market biases. ⁹⁰

- India may suggest that if the provision of new funds or criteria for creating new funds are not based on equity issues, there should be an 'opt out' provision. India should be able to opt for being neither a contributor nor a beneficiary if that makes sense for India in the long run.⁹¹
- While the proposals talk of new mechanisms and sources of funding, the modalities of how these mechanisms are going to function are not unambiguously spelt out yet. For India to assess accurately how the new mechanisms will play out for India, a greater level of detail will be required in terms of modalities which it can propose at the negotiating table⁹².
- The present proposals do not appear to have taken into consideration two specific articles of the Convention⁹³:
 - Article 11.1 talks about public funding, the GEF, grant in concessional basis.
 - Article 11.5 mentions other resources which could be bilateral or the private sector.
 - If the architecture is envisaged to include private and public sector stakeholders then perhaps India could suggest two sets of institutions: the existing one dealing with the public finances and another for the private sector finances. Where is the balance of advantage for India? India should go beyond the current focus on public funds, to look at shaping private flows.
- India could put technology and adaptation as key elements of learning experiences and propose that while the governance architecture of financing is being negotiated, countries in the meanwhile should look at some of the technology and adaptation issues which have been neglected and include them in the interim architecture.⁹⁴

92 Preeti Soni

⁹⁴ Mukul Sanwal

⁸⁷ All these points were made by Preeti Soni.

⁸⁸ Mukul Sanwal

⁸⁹ Preeti Soni

⁹⁰ Preeti Soni

⁹¹ Mukul Sanwal

⁹³ Mukul Sanwal

Closing Session Speech by LM Vas

While organizing this workshop, we had in mind some very specific objectives. These included inter alia, understanding the background and status of the negotiations on climate change and the important topic of climate change financing, nuances of proposals floated by other countries on climate change financing, implications for India and the overall objectives of building capacity in the government to understand these issues, appreciate and debate on them and take informed decisions, when the time comes, on this complex issue.

We are all aware that developing countries are faced with the challenge of sustaining the economic growth and at the same time pursuing social and economic development along with poverty eradication while dealing with the threat of climate change. In the various presentations and discussions, the overriding message seems to be that while we need to remember that the historical responsibility for climate change rests with developed countries, at the same time, the need for following a climate-smart pattern of developing cannot be denied. Navroz Dubash, Mukul Sanwal and Sunita Narain gave us interesting perspectives on this score.

Prodipto Ghosh and JM Mauskar anchored the discussions within the framework of the Convention and highlighted the position of the country within this framework regarding the subject of climate change financing.

Martin Krause gave an excellent presentation, in which he illustrated graphically and concisely, the rationale, mechanism and instruments of climate change financing. He generated a lot of debate on the strategy to be pursued with respect to the negative, low-cost and high-cost options.

A Damodaran put forth relevant perspectives on

financing for mitigation and adaptation and how mitigation has co-benefits in terms of savings on adaptation and the fact that private investment would be more forthcoming in mitigation than in adaptation, which would be more likely to be dependent on public finance resources. Damodaran expressed views on the way the carbon markets exist and the fact that they are not very efficient, prices are too low, and price discovery is poor. The issues that he raised on the right price for CDM are pointers for pursuing solutions to improve and regulate this market with a view to make these markets work more effectively in this circumstance. Shirish Sinha presented the issues related to financing from the civil society perspective and highlighted the need for innovative instruments.

Ajay Mathur highlighted the liability aspect of CCS technology and the importance of acceleration of technology adoption and implication of the costs on the pace of this acceleration including barriers to this acceleration that could come from policy, information and technology. He also adequately expressed financing needs for this technology acceleration.

Ambuj Sagar on the other hand rightly emphasized the importance of the economic and technological appropriateness and the human and institutional capacity for imbibing these technologies. The importance of greater deployment of the technology in the market to bring down the financial cost as well as financing R&D in developing countries was highlighted.

The importance of capturing the negative cost options, 'low hanging fruit' was repeatedly emphasized not by one but by no less than three people—Sunita, Damodaran, and Ajay Mathur—and this presents itself as a good and pragmatic strategy to follow.

In the final session of the day, we got a lucid

presentation by Simon Billett summing up the emerging new issues and debates around the CCF from the perspective of the negotiations starting from the Bangkok COP in October 09 through Barcelona and the pre-COP in December 09 and the architectural implications of the various proposals for India which are mooted by different countries including the US, Mexico, the EU, G77 and the emerging French proposal. There are a lot of issues that remain as we saw in the presentation, particularly the annual versus the assured contribution issue, role of COP and who should contribute. The outlook for Copenhagen and beyond was quite well brought out.

They say that the devil lies in the detail. In this complex and potentially controversial subject, there would appear to be no devil as there is no detail! So we should wait for that whenever it comes and Preeti made a very good point that because no decision may be forthcoming in Copenhagen on CCF we still do have a year to firm up and formulate what could be our views and how could we utilize the existing and interim mechanism.

Important issues were thrown up again in the end by Mukul Sanwal, particularly on what the implications will be for the Finance Ministry in shaping the private flows besides public finance given the provisions of Article 11.4 and 11.5 and how to use the interim architecture which could finally and ultimately become the final architecture.

According to the estimates for climate change finance, I think the quantum is quite mind boggling and whatever the quantum, I think the important points here are that ultimately these flows are donor flows, we have to concentrate on our ability to manage them and recognize the fact that ultimately, as Sunita succinctly put it, these are economic and not ecological negotiations.

These would be some of the important take-aways from this workshop and at the end of the day I would think that the objectives laid for by ourselves in organizing this workshop have been largely achieved. We are grateful to all the participants and discussants for their thought-provoking presentations and observations, thanks to the participants who sat through the day, made very interesting interventions which again fuelled the discussions on various subjects.

Thanks again to our co-host UNDP for putting together a very pragmatic and purposeful agenda on which we have had very good discussions and this has been a very successful conclusion of this workshop.

Agenda for the Workshop

09:30 – 10:00 10:00 – 10:30	 Registration Session opening Welcome : Ms. L M Vas, Additional Secretary (EA) Ministry of Finance, GoI (5 mts) Remarks: Mr. Patrice Coeur-Bizot, UN Resident Coordinator and UNDP Resident Representative (10 mts) Remarks: Mr. Ashok Chawla, Finance Secretary, Ministry of Finance, GoI (10 mts)
10:30 - 11:20	 Agenda introduction : Dr. Alok Sheel, Joint Secretary (MR), Department of Economic Affairs, GoI (5 mts) <u>Session 1</u>: Climate Change Financing – Background, developments and current status, prevalent mechanisms – UNFCC, Kyoto Protocol, IPCC report etc including: Issues related to public finance contribution by Annex-II countries and assessment of such contributions Mechanisms to monitor delivery and dispensation of CC finance How to ensure provision of resources for CCF that are additional, adequate, predictable
	Presenter : Dr. Prodipto Ghosh, Distinguished Fellow, TERI Discussant : Dr. Navroz Dubash, Senior Fellow, Centre for Policy Research
11:20 -11:30 11:30 - 12:20	 <i>Tea Break</i> Session 2: Climate Change Financing – Rationale, Mechanisms, Instruments Catalyzing capital for low carbon technologies and climate resilient development Direct public and private investments Preparing a low GHG and climate resilient strategies Global Environment Facility (GEF) Adaptation Funds (LDCF, SCCF, AF) Kyoto Carbon Finance Instruments - Clean Development Mechanism (CDM) REDD Facilities: UN-REDD, Forest Carbon Partnership Fund (FCPF) Climate Investment Funds (CIF): Clean Technology Fund (CTF) & Strategic Climate Fund (SCF) Other innovative instruments: Financing for local authorities Presenter: Mr. Martin Krause, Team Leader, Climate, Environment, Energy – UNDP Regional Centre, Bangkok Discussant: Mr. Mukul Sanwal, Associated with South Centre, Geneva
12:20 - 13:10	<u>Session 3</u> : Current thinking in India on Climate Change Financing Presenter: Mr. J M Mauskar, Additional Secretary, Ministry of Environment and Forests, GoI Discussant: Ms. Sunita Narain, Director, Centre for Science and Environment
13:10 – 14:00 14:00 – 14:50	Lunch break <u>Session 4</u> : Environment Financing Architecture: Assessment of Financing Proposals for Climate Change Adaptation Presenter: Prof. A Damodaran, Indian Institute of Management, Bangalore Discussent: Mr. Shirish Sinha, Head, Climate Change and Energy WWE India
14:50 - 15:40	Session 5: Energy, Technology, and Climate Change and Energy Efficiency, Ministry of Power, Gol Presenter: Dr. Ajay Mathur, Director General, Bureau for Energy Efficiency, Ministry of Power, Gol Discussant: Draf Arshui Sacor UT Delhi
15:40 - 17:00	Discussant: Prof. Ambuj Sagar, III, Delni Session 6: Emerging new issues and debates around Climate Change Financing and implications for India Discussions on CC Financing in Bangkok, Barcelona and Copenhagen G77 views Mexican proposal US proposal EU proposal Other proposals Presenter: Mr. Simon Billett, Climate Policy Specialist, UNDP New York Discussants: Dr. Preeti Soni, Head of Energy and Environment, UNDP India and Mr. Mukul Sanwal, Associated with South Centre, Geneva
17:00	Closing remarks Department of Economic Affairs

List of Participants

Inaugural Panel

Ashok Chawla	Finance Secretary, Ministry of Finance
Patrice Coeur-Bizot	UN RC & UNDP RR
L M Vas	Additional Secretary (EA)
Alok Sheel	JS (MR)
Chaitanya Prasad	Director (UN)
Pieter Bult	Deputy Country Director UNDP

Ministry of Environment & Forests

J M Mauskar	Additional Secretary	Ministry of Environment & Forests (also as speaker)
R R Rashmi	Joint Secretary	Ministry of Environment & Forests
Hem Pande	Joint Secretary	International Cooperation, Ministry of Environment & Forests
R K Sethi	Director	Ministry of Environment & Forests
S Satapathy	Additional Director	Ministry of Environment & Forests
S K Sharma	Scientific Adviser	Ministry of Environment & Forests

Ministry of External Affairs

Rajiva Misra	Joint Secretary(UNES)	Ministry of External Affairs
Pranay Verma	Director(Climate Change)	Ministry of External Affairs
Luther Rangreji	Legal Officer	Ministry of External Affairs

Ministry of Power

Devender Singh	Joint Secretary	Ministry of Power
Ajay Mathur	Director General	Bureau of Energy Efficiency (also as speaker)
Kapil Mohan	Director	Ministry of Power
Malay Srivastava	Director	Ministry of Power

Ministry of New and Renewable Energy

	Gauri Singh	Joint Secretary	MNRE
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Ministry of Petroleum and Natural Gas

	Archana S Mathur	Economic Adviser	Ministry of Petroleum and Natural Gas
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Ministry of Finance/ Department of Economic Affairs

R C Srinivasan	Principal Adviser
H A C Prasad	Senior Economic Adviser
M Deena Dayalan	Joint Secretary & Financial Adviser
Anup K Pujari	Joint Secretary (MI)
K P Krishnan	Joint Secretary(CM)
Kumar Sanjay Krishna	Joint Secretary(ABC)
Shaktikanta Das	Joint Secretary(Budget)
Govind Mohan	Joint Secretary(I&I)
Meena Agarwal	Joint Secretary(PF-II)
Dakshita Das	Joint Secretary CAAA
M R Anand	Economic Adviser
Anil Bisen	Economic Adviser
R N Dubey	Economic Adviser
Rajan Kumar	Economic Adviser
K L Prasad	Economic Adviser
Nilay Mitash	Director(MR)
Sudhakar Shukla	Director(FT)
Prabodh Saxena	Director(FIPB)
Prabhat Kumar Mishra	Director(I&I)
V Sivasubramanian	Director(Infra-Finance)
Surenderkumar Bagde	Director(Japan)
Sanjay Kumar	Director(PMU & BM)
Neeta Bhushan	Director(Europe)
Surjit Singh	Director(RTI&Coord)
D K Singh	Director(MI)
Anuj Arora	Director(MI)
Kavita Prasad	Director(MI)
Anuradha Thakur	Director(ADB-I)
A M Bajaj	Director(EM)
C S Mohapatra	Director(SM&IC)
Alok Chopra	Director(Budget)
C K G Nair	Director(PM&RE)
Brajendra Navnit	DS(FRBM)

Rosy Sharma	Director(Finance)
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B S Rawat	Deputy Secretary(C&C)
Ritesh Kumar Singh	Deputy Secretary(Budget)
V K Sharma	Deputy Secretary(BM)
Naresh Mohan Jha	Deputy Secretary(Budget)
M Bakthavathsalu	Deputy Secretary(Finance)
Sagar Mehra	Deputy Secretary(Admn.)
Swarn Dass	Deputy Secretary(Vig.)
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Anil Bisen	Economic Adviser
R N Dubey	Economic Adviser
Rajan Kumar	Economic Adviser
K L Prasad	Economic Adviser
Aparna Bhatia	Joint Director (PPP)
Antony Cyriac	Additional Economic Adviser
Kali Charan	Additional Economic Adviser
V K Gupta	Additional Economic Adviser
J S Kochher	Additional Economic Adviser
Rajiv Malhotra	Additional Economic Adviser
Rajasree Ray	Additional Economic Adviser
Manisha Sen Sarma	Additional Economic Adviser
Sunil Saran	Additional Economic Adviser
R Sathish	Additional Economic Adviser
A K Singh	Under Secretary(MR-III)
V Vanlalramsanga	Deputy Director(MR-I)
Devendra Kumar	Section Officer(MR-I)
Y Y Parate	Section Officer(MR-I)
Gracy James	Section Officer(MR-III)
Hemlata Hotchandani	Section Officer(MR-III)
K Saraswathy	Section Officer(MR-IV)
A K Singh	Section Officer(MR-V)
Ujjawal Kumar	Section Officer DEA

List of Participants

Sunita Narain (also as discussant)	Director	Centre For Science And Environment
Prodipto Ghosh (also as speaker)	Distinguished Fellow	TERI
A Damodaran (also as speaker)		Indian Institute of Management, Banaglore
Shirish Sinha (also as discussant)	Head Climate Change & Energy Programme	WWF – India
Navroz Dubash (also as discussant)		Centre for Policy Research
Mukul Sanwal (also as discussant)		Associated with South Centre, Geneva
Suman Bery	Director General	National Council of Applied Economic Research
Ambuj Sagar (also as discussant)		IIT, Delhi
Bornali Bhandari		Fellow, National Council of Applied Economic Research (NCAER),
Rajiv Kumar	Director	Indian Council for Research on International Economic Relations
Shrawan Nigam	Senior Consultant and Head, ICRIER Regional Desk	Indian Council for Research on International Economic Relations

Academic and Research Institutions:

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Martin Krause	Team Leader	Climate Environment Energy – UNDP Regional Center Bangkok (Speaker)
Simon Billett	Climate Policy Specialist	UNDP New York (Speaker)
Pieter Bult	Deputy Country Director	UNDP India
Preeti Soni	Head	Energy and Environment, UNDP India
Momin Jaan	Acting Head	MSU, UNDP India
Priyanka Khanna	Head	Communications Unit, UNDP India
Matteo Marchisio	Environmental Specialist (Adaptation)	Energy and Environment Unit UNDP India
Lianchawii	Programme Associate	Energy and Environment Unit UNDP India
Chitra Narayanswamy	Programme Associate	Energy and Environment Unit, UNDP India
Archana Bhardwaj	Programme Associate	UNDP India
Mohan Krishnan	Programme Assistant	UNDP India
Manju Narang	Programme Assistant	UNDP India