

**TAER-INSEE Seminar on
Climate Change and Markets:
Opportunities, Challenges, and Policy Concerns**

Organised in association with

TERI University

At TERI University, Vasant Kunj, New Delhi

February 11, 2011

The Takshashila Academia of Economic Research (TAER) and Indian Society for Ecological Economics (INSEE) organised a one-day seminar on *Climate Change and Markets: Opportunities, Challenges, and Policy Concerns*, in association with TERI University at the TERI University campus in Vasant Kunj, New Delhi, on February 11, 2011. The seminar was marked by some good paper presentations, a participation of around 100 participants, and was highlighted by the presence of Minister of State for Environment and Forests, Dr. Jairam Ramesh, as Chief Guest, who also released a book on *Debate over Climate Change and Global Warming* edited by Dr. Madhoo Pavaskar (Director of TAER) and Dr. Nilanjan Ghosh (Senior Vice President of TAER and General Secretary of INSEE). Mr. Suresh Prabhu, Former Cabinet Minister and MP, was also present as the Guest of Honour.

The inaugural session was chaired by Prof. Bhavik Bakshi, Vice Chancellor of TERI University. Prof. Kanchan Chopra, President of INSEE, talked on the problems of climate change and brought in the critical debate on whether markets can resolve climate change problems. She also highlighted INSEE's work in this regard, and announced that INSEE is publishing a volume titled *Environmental Governance: Approaches, Imperatives and Methods*, in association with Macmillan publishers, out of the selected papers presented in the Fifth Biennial Conference of the Society. She also announced that INSEE is organising its sixth biennial conference at CESS, Hyderabad, during October 20-22, 2011. Dr Madhoo Pavaskar, Director of TAER, raised the question: is climate change a myth or a reality? According to him, if climate change is a reality, the real recipe for emission reductions is not regulations but markets. Thus, he expressed that climate exchanges need to be set up. He further expressed that such a climate exchange needs to be regulated by the Ministry of Environment and Forests.

Mr Suresh Prabhu, the guest of honour, agreed that climate change is a natural phenomenon existing since time immemorial. But since the Industrial Revolution, the change is more manmade than anything else, and will be felt quite strongly. He also expressed that markets can be one of the solutions.

The Environment Minister Jairam Ramesh labelled himself as a “market agnostic”, and so was not sure whether markets would be the only solution to the climate change problem. He felt that if the climate change problem was left to unbridled market forces, then the next financial crisis would be round the corner because of the carbon and climate change markets. He hence recommended a caution while looking at markets for solution. He reiterated that India is committed to reduce emission intensity, which means lesser emissions units for every incremental increase in GDP. At the same time, he requested TAER to submit to him a blue-print of a climate exchange, presenting its conceptual framework, potential modus operandi and its possible benefits.

Dr. Nilanjan Ghosh, General Secretary, INSEE and Senior VP, TAER, while offering the Vote of Thanks at the end of the Inaugural Session, introduced the audience with the theme of the Seminar and the issues on which the deliberations were supposed to take place.

The ensuing three sessions of the seminar, revolving around the themes of “Critical Issues of Climate Change and Solutions,” “The Role of Environmental Markets,” and “Towards Development of Derivative Markets” saw 12 interesting papers being presented and were marked by probing questions from an audience that actively participated in the deliberations. The day-long deliberation attempted to answer the following: Can markets really help an economy like India to fulfill its obligations under the various environmental conventions to combat desertification, biodiversity degradation, and global climate change? Can markets further create the possibility of engaging various rural communities in formal market transactions, thereby reducing the extent and magnitude of poverty? What types of markets can do that? Can electronic exchanges on environmental products work under such circumstances? How can they be established, and what types of products can be traded there?

The first session on critical issues of climate change and solutions was supposed to be chaired by Prof. Jyoti Parikh, who had to leave early due to health reasons but not before delivering an interesting speech on adaptation issues. Dr Nilanjan Ghosh then chaired the session. Prof. Surender Kumar presented a joint paper by him and Parul Gupta on “Tracking the

Anthropogenic Drivers of CO₂ Emissions Growth in India”. This interesting paper attempted to address three issues: construct and analyse CO₂ emissions inventory for a panel of Indian states for the years 1980 through 2007, track the anthropogenic drivers of CO₂ emissions at state level using the IPAT identity, and apply the STIRPAT model to project and compare CO₂ emissions estimates for 2020 under two scenarios: emissions estimates based on CO₂ intensity of 2005, and emission estimates based on a reduction in the intensity by 20 percent relative to 2005. This was followed by Dr Nilabja Ghosh’s presentation on “Agriculture as Sink” where she spoke on how carbon accumulation in agricultural soil could offset emissions made elsewhere. The third paper by Amsalu Woldie and Prof. Surender Kumar focussed on the “Trilemma of Biofuels: Energy, Food Security, and the Environment.”

The theme of the second session was “The Role of Environmental Markets.” Prof. Kanchan Chopra chaired the session. The theme of the joint paper by Pulak Mishra, Bhagirath Behra, and Narayan C. Nayak was on “Markets for Environmental Services” and the opportunities and challenges therein. Dr. Pulak Mishra presented the paper. According to the paper, the design of [payments of environmental services] PES schemes is diverse and cannot be replicated. Given the diverse and complex ecosystem and their management institutions, India has tremendous potential to develop similar markets for environmental services that can help promote both environmental conservation and livelihood of poor people. The next paper by Dalbir Singh was on “Market Mechanism in Managing Water Resource in Diverse Environments,” and the paper by Pleasa Abraham and G. Haripriya focussed on “Barriers to the Deployment of Low Carbon Technologies” because of “persistent market failures and policy inertia due to the existence of carbon lock-in[s]” that create these barriers. Therefore, “in spite of their apparent environmental and technological advantages, renewable technologies cannot take off in the market.” The concluding paper of the session was by Dr R. B. Lal, Dr Madhu Verma, Swapan Mehra, and Priyanka Batra. Ms. Priyanka Batra presented the paper, while Madhu Verma, Swapan Mehra and she, together addressed the questions from the audience. The paper dealt with REDD+ and how it could provide market solutions for conserving forests.

The third session on “Towards Development of Derivative Markets” was chaired by Dr Madhoo Pavaskar. The session began with Dr G. Haripriya’s paper on “Policy Options for Carbon Locking”—a spill over from the earlier session. The next paper by N. Y. Dinesh Babu was on “Ratings and Risk Mitigation Techniques for Scaling Climate Financing,” was presented by Sudhanshu

Sharma because of the author's absence due to health reasons. Arnab Bose wound up the session with his presentation on "Derivatives and the Carbon Market—Redefining the Underlying Asset of the Carbon Derivative."

That brought to an end an eventful day marked by interesting concerns raised by the presentations from various speakers, and the probing questions from an audience that actively participated in the deliberations.

Seminar on
Climate Change and Markets:
Opportunities, Challenges, and Policy Concerns

Organised by
Takshashila Academia of Economic Research (TAER) Limited, Mumbai
&
The Indian Society for Ecological Economics (INSEE)
In association with
TERI University
at TERI University, Vasant Kunj, New Delhi
February 11, 2011

Programme

Registration: 9:30 am – 10:00 am

Inaugural Session: 10 am to 11:20 am.

Chair: Vice-Chancellor TERI University

Welcome Address	Vice Chancellor, TERI University	10:00am -10:20 am
Opening Remarks	Prof. Kanchan Chopra, President of INSEE	
Introduction of Theme	Dr. Madhoo Pavaskar, Director, TAER	
Address by the Guest-of-Honour	Mr. Suresh Prabhu, Former Minister of E and F	10:20 am – 10:45 am
Address by the Chief Guest, followed by release of TAER's book on climate change	Dr. Jairam Ramesh, Honorable Minister of Environment and Forests	10:45 am – 11:15 am
Vote of Thanks	Dr. Nilanjan Ghosh, Senior VP, TAER and General Secretary, INSEE	11:15 am -11:20 am

Tea Break: 11:20 am to 11:30 am

Session 1: Critical Issues of Climate Change and Solutions: 11:30 am to 1: 10 pm

Chair: Prof. Jyoti Parikh, Executive Director, IRADE

Climate Adaptation: Poverty and Markets	Prof. Jyoti Parikh, IRADE	11:30 am – 11:55 am
Tracking the Anthropogenic Drivers of CO2 Emissions Growth in India	Ms. P. Gupta and Prof. S. Kumar, TERI and Delhi University	11:55 am – 12:20 pm
Agriculture as a sink: A Compatible solution for India	Dr. Nilabja Ghosh, IEG Delhi	12:20 pm – 12:45pm
The Trilemma of Bio-fuels	Mr. A. Woldie and Prof. S. Kumar, TERI	12:45 pm – 1: 10 pm

Lunch Break: 1:10 pm to 2:00 pm

Session 2: The Role of Environmental Markets: 2:00 pm to 4:05 pm.

Chair: Mr. V.B. Eswaran, IAS (Retd.), Former Secretary, Government of India.

Markets for Environmental Services in India: Opportunities and Challenges	B. Behera, P. Mishra, N.C. Nayak, IIT Kharagpur	2:00 pm – 2:25 pm
Market Mechanism In Managing Water Resource In Diverse Environments	Dalbir Singh, CEDS Jaipur	2: 25 pm – 2:50 pm
Policy Options for Carbon Locking	Dr. G. Haripriya, IIT Bombay	2:50 pm – 3:15 pm
Barriers to the deployment of Low Carbon Technologies: A case study on ArunTM 160 technology	P. Abraham and G. Haripriya, IIT Bombay	3:15 pm – 3:40 pm
REDD+: Carbon Market Solutions for Conserving Forests	R. B. Lal, Madhu Verma, Swapan Mehra, Priyanka Batra, IIFM Bhopal	3: 40 pm – 4.05 pm

Tea Break: 20 minutes

Session 3: Towards Development of Derivative Markets: 4:25 pm to 6:05 pm

Chair: Dr. Madhoo Pavaskar, Director, TAER.

Ratings and risk mitigation techniques for scaling Climate Financing	N. Y. Dinesh Babu	4: 25 pm – 4:50 pm
Can India Develop Environmental Exchanges? Lessons from EU and US	P. Ram Babu	4:50 pm – 5.15 pm
Redefining the Underlying Asset of the Carbon Derivative	Arnab Bose, TERI	5:15 pm – 5:40 pm
Regional Water Futures Exchange as an Institutional Response to Transboundary Water Disputes in South Asia	Nilanjan Ghosh, TAER.	5:40 pm – 6:05 pm

6:05 – 6:10 pm: Vote of Thanks.

Background Note for One-day Seminar on
***Climate Change and Markets:
Opportunities, Challenges, and Policy Concerns***

Organized by

Takshashila Academia of Economic Research (TAER) Limited, Mumbai

&

Indian Society for Ecological Economics

Takshashila Academia of Economic Research (TAER) Limited, Mumbai, and the Indian Society for Ecological Economics (INSEE) are organizing a one-day seminar on “Climate Change and Markets: Opportunities, Challenges and Policy Concerns” at TERI University, New Delhi, on February 11, 2011.

Climate change is a burning issue globally, despite the prevailing uncertainties about the information and knowledge base created on the science of climate change. Whether climate change is natural or anthropogenic in origin is still debatable among climatologists, meteorologists, physicists, geologists, space scientists, and others. But one thing is certain that ever since the discovery of fire by man, the end of his nomadic life, and the rise of human settlements, man has been exploiting natural resources and polluting the environment by emitting a wide variety of greenhouse gases (GHG)—an “externality” of the process of development. The fact remains that natural resource depletion, degradation, and environmental pollution have resulted in a change in the statistical distribution of weather over periods of time that range from decades to millions of years. The most alarming part of this change entails the consequent losses in ecosystem services that has been a significant (yet ignored for a long time) explanatory variable of the human well-being function. That without such anthropogenic interventions in the eco-hydrological cycles as also without the emissions, civilizations would not have emerged on the face of the earth is quite true. But it is equally true that the release of CO₂ and other pollutants, human intervention in hydrological flows, and depletion of forest resources have been damaging the environment and the ecological balance of the planet. The rapid rates of industrialization and urbanization since the

nineteenth century have further aggravated the ecological scenario and accentuated climate change. It is apprehended that this will primarily have an adverse effect on agriculture, as well as on other livelihoods, threatening perhaps the future of human existence.

While the GHG emissions can be prevented by stringent penal laws, such efforts will not only be unsustainable, but might even prove counter-productive for the economy in the long run. For one thing, penal provisions to stop GHG emissions are hard to enforce, and may also lead to closure of several productive economic activities, with disastrous consequences to the growth of most economies, especially emerging economies. On the other hand, with rising world population, and almost half the world still reeling under abject poverty, it is not only absurd, but also naive to expect the world to ban productive economic activities to prevent the growth of harmful emissions. The question that has been looming large before civilizations for the last two decades, therefore, is: Development? Yes! But, at what cost?

It has often been proposed that over time, improved and fuel-efficient technologies may help to reduce, if not eliminate altogether, GHG emissions from diverse polluting industries and other economic activities. The other problem arises with natural resource use, exploitation, and depletion. As climate change modifies the rainfall cycle in various parts of the world, as also in south Asia, the problems have only compounded. Water scarcity is turning out to be a temporal problem, and water conflicts are intensifying due to increased water demand for food production and energy needs. Depletion of forest resources have only added further to the problems. The concern, therefore, cannot merely be confined to technological interventions to combat environmental problems of GHGs, water quality, and natural resource depletion. There has to be a broader institutional intervention that can help in looking at resolution mechanisms from a different perspective.

Under such circumstances, it is believed by many that a market-oriented approach may help combat the challenges of climate change that humanity faces. It has been said that a “sustainable” development path should take into consideration institutions that would be conducive for greater participation of citizens at various levels. Here comes the crucial role of market mechanism! Carbon markets have developed worldwide, and

trading has been taking place successfully, thereby creating a pathway for sustainable development financing. Electronic exchanges trading emission permits are already in vogue, though there has rarely been much serious assessment of their utility to human well-being. However, an assessment of response strategies undertaken by the Millennium Ecosystem Assessment¹ highlighted the potential of market-based strategies to mitigate the degradation of ecosystem services.

There have been establishments of markets for ecosystem services, and as argued by many, payments for ecosystem services can help in rural poverty alleviation and of conservation simultaneously^{2, 3}. Economists have also been instrumental in devising tools like environmental and ecosystem valuation to assess the value of the benefits that accrue to human civilization by the environment^{4, 5}. This has often helped in devising rules of compensation for environmental damages that cause economic losses to backward communities⁶, as also help market creation.

The recent expansions of markets for other environmental services suggest that they may rapidly become a central point of sustainable development financing, representing tens of billions of dollars annually within the next 10 to 15 years, and simultaneously help combat the challenges of climate change. All these moves toward markets have been triggered by two major drivers that include conscious national environmental policy movements toward market-based instruments and rising demand for environmental goods and services from public authorities, private entities, and consumers. On the one hand, there are new public regulations along with the

¹ Millennium Ecosystem Assessment (2005): *Ecosystems and Human Wellbeing: Opportunities and Challenges for Business and Industry*, (Washington DC: World Resources Institute).

² Kumar, P. and R. Muradian (2009): *Payment for Ecosystem Services*. (New Delhi: Oxford University Press).

³ Uddhammar, E. and N. Ghosh (2009): "Development and Conservation in three protected areas in East Africa and India: Does Tourism lead to a Synthesis?", *Decision*, 36 (3), 63-82.

⁴ Chopra, K. and S. K. Adhikari (2004): "Environment Development Linkages: Modelling a Wetland system for Ecological and Economic Value", *Environment and Development Economics*, 9 (1), 19-45.

⁵ Costanza, R., R. d'Arge., R. de Groot, S. Farber, M. Grasso, B. Hannon, K. Limburg, S. Naeem, R. V. O'Neill, J. Paruelo, R. G. Raskin, P. Sutton, and M. van den Belt (1997): "The value of the world's ecosystem services and natural capital". *Nature*, 387, pp. 253-260.

⁶ Ghosh, N. and C.S. Shylajan (2005): "Coastal Mangrove Ecosystems, Fishermen's Welfare and Anthropogenic Externalities: Compensatory Payments through Mangrove-Fishery Linkages", in Sengupta, N. and J. Bandyopadhyay (eds.) *Biodiversity and Quality of Life*, 294-315 (New Delhi: Macmillan Publishers).

establishment of market-based instruments, and on the other, it has become quite lucrative and fashionable for private players to show initiatives toward efforts of biodiversity protection. Consumer demand for derivatives of healthy ecosystems like organic foods, fair trade products, and eco-tourism has also increased over time. Its positive incidence on human health and overall welfare is also being steadily documented.

However, there are detractors of this hypothesis who can be categorized into two groups. One group feels that the markets are ineffective and lack the potency to create a positive change. On the other hand, there are others who feel that markets are only counter-productive, and can further aggravate environmental problems, rather than providing solutions. By creating a market for environment, it has been allegedly stated, one buys the right to pollute or degrade the environment further^{7,8}. It has been expressed that protection of environments is best served by resistance to the spread of commodity exchange and its norms and defending environmental goals through established ethical, aesthetic, political and scientific standards.

In the midst of such doubts and debates, the proposed seminar intends to look at markets as institutions for combating climate change from a normative as well as from a positive perspective. The concerns are, therefore manifold: can markets really help an economy like India to fulfil its obligations under the various environmental conventions to combat desertification, biodiversity degradation, and global climate change? Can markets further create the possibility of engaging various rural communities in formal market transactions, thereby reducing the extent and magnitude of poverty? What types of markets can do that? Can electronic exchanges on environmental products work under such circumstances? How can they be established, and what types of products can be traded there?

Thus, the seminar aims at discussing the various problems involved in developing effective and efficient mechanisms for trading in ecosystem and environment-related products that may involve clean energy and emission reduction products, natural-

⁷ O'Neill, J. (1993): *Ecology, Policy and Politics: Human Well-Being and the Natural World*. (London: Routledge).

⁸ O'Neill, J. (2001): "Markets and the Environment: The Solution is the Problem", *Economic and Political Weekly*, 36 (21), 1865-73.

resource-based products as also ecotourism markets. The idea is to critically analyze and comment on the effectiveness of not merely markets as a whole, but also to comment on what form of markets might be effective to combat the problems that south Asia/ India faces with its ambient environment and natural resource use, and subsequently promote regional development. For the seminar, papers are invited on the following themes:

1. Need for developing market mechanisms for reducing environmental pollution (greenhouse gas emissions), natural resource (water and forest) depletion, and water quality degradation;
2. The problems of valuation and pricing of non-marketed environmental resources;
3. Kinds of markets and trading systems that can be developed to reduce pollutants, and mitigate natural resource scarcity—their merits and demerits;
4. Types of legislative and regulatory actions needed for developing suitable market systems for the above products;
5. Learnings from worldwide ecosystem and environmental markets (case studies on PES, RUPES, climate exchanges, and so on);
6. Political economy of climate change and market microstructure problems;
7. The suitability of establishing a climate exchange in India for trading in diverse energy, environment, and other ecosystem-related derivative products;
8. The nature, organization, management structure, and mechanisms for trading, clearing, delivery, and settlement of exchange-traded products;
9. The types of products that can be developed and traded on the proposed climate exchange to mitigate adverse impacts of climate change;
10. The drawbacks and adverse consequences of developing markets for climate change products.

These themes are indicative and not exhaustive. They will be discussed in three sessions of the seminar.

Date of seminar: February 11, 2011