

ICARN

INDIAN CLIMATE RESEARCH NETWORK

An initiative of IIT Delhi, IIT Madras,
Indian Institute of Science Bangalore & CSE

NEWSLETTER 02

Foreword

Rio +20: Ghost of Climate Change Haunts Rio

Summary of 2012 Bonn Climate Change Conference

Summary of India's Second National Communication to
the UNFCCC

Research Funding Announcements

Meetings on climate change

Contact

Dear friends and colleagues,

Welcome to the second newsletter of the Indian Climate Research Network (ICRN). We are proud to announce registrations of 60 members within a month of the launch of the website (www.icrn.in). We are currently accepting registrations, so go to the website, fill out a simple form and send it to us.

Once you register, you will be able to see the profiles of the members and their areas of expertise and connect with them. Besides their profiles, we have uploaded detailed profiles of the ICRN advisory team, comprising senior scientists and experts from Indian Institute of Technology-Madras and Delhi, Indian Institute of Science, Bangalore, and Centre for Science and Environment.

You will have access to all their papers and work, and they will all be an e-mail away, promptly responding to all your queries and comments.

Through our new discussion forum, which brings the entire climate change community onto one platform, you will be able to share your research with the entire community and resolve any issues with your research from the pool of best senior scientists in the country who are part of ICRN.

Then, we have our regular daily climate bulletin, announcements on research funding and meetings on climate change and jobs. There is a wealth of information in the website's research papers section. All the latest research on climate change, from policy to practice, from mitigation to adaptation, from science and technology to sociology, there is all this and more!

In case you have missed the first ICRN newsletter, you will be able to download it from the website. Among other things, it has separate policy briefs on clean development mechanism and mangroves ecosystem.

Web viewers will also have access to all the presentations of those who participated in two of our earlier conferences, held under the banner of 'CSE-IIT National Research Conference on Climate Change'.

In our second newsletter, we bring you an update of how the Rio +20 summit on sustainable development ended up with a weak text and how developments in climate change negotiations at Bonn made little headway, and a report on India's second National Communication to the UNFCCC, detailing India's emissions inventory and vulnerability assessment.

We hope you enjoy reading the newsletter and provide us with feedback.

With best wishes,

The Indian Climate Research Network Team

The screenshot shows the ICRN website interface. At the top, there's a navigation bar with 'Home | Member Profiles | Forums'. Below that, a login section for members is visible with fields for 'Username' and 'Password', and links for 'Create new account' and 'Request new password'. The main content area is divided into three columns: 'Members Profile' with a list of team members and their roles; 'Research Papers' with a list of recent publications; and 'Advisers' with a list of expert advisors.

Ghost of Climate Change haunts Rio

Trust deficit between rich and poor nations, a legacy of failed climate negotiations, has led to paralysis of ambition



ARNAB PRATIM DUTTA / CSE



CHANDRA BHUSHAN

The distance between Flamengo Park and Rio Centro was as huge as the difference that exists in thinking and expectations between civil society groups and governments. Flamengo Park was where the Peoples' Summit was being held and Rio Centro was the location for official negotiations on the United Nations Conference on Sustainable Development.

At the Peoples' Summit, thousands of activists, community groups and NGO representatives discussed, debated and demanded a new future for the world: an environmentally sustainable future without poverty, discrimination and deprivation. At Rio Centro, however, governments had already finalised the final conference text, titled 'The future we want', which read more like a high school lesson in sustainable development than an action plan for a new sustainable development paradigm. Unlike the 1992 Rio conference, no new convention was signed or new paradigm articulated.

Text without meaning

The final text of Rio+20 is minimalistic, to the extent of being a big disappointment. It was finalised two days before the starting of the high-level session, in which the heads of states spoke, negotiated and gave finishing touches to the document.

Every issue has either been postponed to some future date, or converted into ifs and buts or has been rendered completely meaningless by allowing each country to do whatever it wants. The document reflects a complete lack of ambition to tackle multiple crises and challenges—economic, social and environmental—the world is facing today. There is absolutely no recognition in the text that Earth has finite carrying capacity; that humanity is already consuming resources and polluting the environment beyond the carrying capacity of Earth. At many places, the text reads more like a growth manifesto rather than a charter for sustainable development.

The Rio+20 summit was supposed to usher in a “green economy”, but the final text has no definition for it. What it has on green economy are words, without meaning. Sample the following: “We consider green economy in the context of sustainable development and poverty eradication as one of the

important tools available for achieving sustainable development.”

Goalpost shifted

The conference was also to propose sustainable development goals (SDGs) to move the world towards a sustainable future. What it has, instead, are empty words and postponement of the development of such goals till 2015. The conservation and sustainable use of the oceans and seas was another big-ticket item that the conference failed to address adequately.

So, why have the governments agreed to do so little? I believe that the lack of trust between the developed and developing countries, created largely because of the failed climate change negotiations, has made the governments so defensive that there is a complete paralysis of ambition. It was clear that ghost of Copenhagen, Cancun and Durban had finally arrived to haunt Rio+20.

To read *Down To Earth's* detailed coverage on Rio+20, go to:

<http://www.downtoearth.org.in/content/future-compromised>

<http://www.downtoearth.org.in/content/rio-not-plus-or-minus-just-20>



CHANDRA BHUSHAN / CSE

At the Peoples' Summit simultaneously on at Flamengo Park in Rio, community groups, NGOs and activists demanded a new future for the world

Opportunities lost

Several unfinished tasks at Bonn; Will Doha resolve them all?



IIISD

A view of the room during the AWG-LCA plenary

In the months following Durban, the Bonn 2012 Climate Conference was seen as the first real opportunity that countries had to not only take the progress made at Durban forward, but also as an opportunity to take real decisions on concrete climate change action. However, despite the heady optimism visible at the beginning of the conference, the Bonn conference singularly failed to live up to the hype. Disputes on a number of issues, including agenda, equity, finance and even the election of officials, ensured that any progress made at Bonn was glacial at best. Featuring over 192 countries in attendance Bonn also highlighted the challenges ahead in tackling climate change multilaterally.

The conference, held at Bonn from May 14-25, marked the first session of the Ad-hoc Working Group on the Durban Platform for Enhanced Action (ADP). Under the agreement reached at Durban, the ADP had been mandated to create a new protocol, legal instrument or an agreed outcome with legal force under the UNFCCC to come into effect from 2020. Other sessions included the 15th session of the Ad-hoc Working Group on Long-term Cooperative Action (AWGLCA) and the 17th Session of the Ad-hoc Working Group on Further Commitments for Annex 1 Parties under the Kyoto Protocol (AWG-KP). Along with the mandate of the ADP, it was also decided at Durban that discussions would



IIISD

Delegates at the ADP session

be held on a second commitment period under the Kyoto protocol as well as terminating the AWG-LCA and AWG-KP at Doha. Bonn also hosted the 36th session of both the Subsidiary Body of Implementation (SBI) and the Subsidiary Body for Scientific and Technological Advice (SBSTA). Despite the euphoria that was apparent in the build-up to Bonn, once the talks had commenced, they were often disrupted by disputes between parties on matters related to agenda and organisation. This was especially true of the first session of the ADP.

Durban Platform for Enhanced Action

The session had begun positively with both developed and developing countries expressing their hopes for the ADP and pledged to begin working in earnest. Despite a positive start, throughout the course of Bonn the ADP was continually wracked by disputes over procedure and agenda, which some member nations had described as ‘unprecedented’. A key point of contention amongst parties during the ADP session was on the issue of enhancing the level of mitigation ambition to ensure that global temperatures do not rise above 2°C, with particular relevance to the gap that exists between countries’ voluntary pledges for 2020 and the increased ambition needed to stay on the 2°C pathway. The initial agenda of the ADP had listed the concept of a work plan for the post-2020 climate deal as well for the pre-2020 landscape. However, during Bonn while most parties agreed that mitigation was at the core of the ADP, they still had numerous opposing viewpoints on how it would be addressed. Parties could not decide whether increasing ambition on the 2020 pledges that countries had already made needed to be addressed under the ADP. At Durban, as decisions were being reached for a new framework that would come into effect in 2020, the level of ambition was one of the key points discussed and agreed to in the final Durban text. But whether this would also include pre-2020 was left ambiguous up until the last minute. To address fears of the small island nations that this would leave the world with weak ambition for the next eight years, the EU stepped in. The pre-2020 ambition essentially was added in the last minute at Durban. But more importantly, ambition is only one of seven points in the Durban text. Other

issues that were also listed included finance, technology transfer and adaptation. The overarching emphasis that ambition was given at Bonn at the expense of the other six points of the Durban text raised the hackles of the developing world. While some developed countries had insisted that the pre-2020 ambition gap be addressed under the ADP along with discussions on the post-2020 gap, a collection of developing nations led by China, India and a host of Latin American and Arab and African countries (who represented 60 per cent of the parties assembled) argued otherwise. They held that such a position would have rendered discussions under the AWGKP and AWG-LCA meaningless. Their rationale for this position is underscored by the fact that under the AWG-LCA, the Bali action plans reaffirms the convention’s core principle of Common but Differentiated Responsibility (CBDR), while the ADP had no such safety net. This consequently led to numerous delays in the adoption of the agenda and the election of the officers, with the latter only being decided on the final day of the conference. Even the agenda was adopted on the last day of the conference, in its final few minutes.

Long-term cooperative action

While not as turbulent as the ADP sessions, the AWG-LCA session was also witness to numerous disagreements over the agenda and the future of the track, thus once again highlighting the significant differences that continue to persist between developed and developing countries on climate change action. The developed countries such as the EU and the US while stressing on the ‘urgency’ of the situation called for moving the negotiations forward. They cited that ‘significant progress’ had been made since the adoption of the Bali Action Plan, through the establishment of specific institutions such as the Green Climate Fund, the Technology Executive Committee and the Adaptation Committee. They instead called for a focus on the items listed as a priority under the Durban package in Decision 2/CP.17 (outcome of the work of the AWG-LCA). These included issues such as new market mechanisms, clarity on pledges, bunker emissions, REDD finance and a common vision under the LCA agenda. This insistence on progress made as well as the continued calls to quickly dissolve the AWG-LCA before Doha, was seen with suspicion by

EQUITY WORKSHOP

- One of the workshops held at Bonn, titled equitable access to sustainable development, discussed what equity meant with regard to sustainable development and climate policy.
- While the workshop helped clarify many issues on equity, it still failed to move beyond the old north-south divide.
- Representatives from BASIC (Brazil, China, South Africa, India) countries presented their positions on equitable access to the carbon space based on the principles of the convention especially that of equity and CBDR. They also talked about the need for technology transfers to developing countries to enhance their resilience to climate change.
- The developed world also stuck to its position with the US insisting that a broad based definition of the concept of equity was needed as a narrow approach would not be just.
- The EU added that the principles of the convention needed to reflect the changing realities of the present world.

the developing countries. It was seen as an attempt to avoid binding commitments of the industrialised countries under the AWG-LCA and instead “jump ship” to a new framework. Furthermore, the lack of any progress at Bonn on issues pertaining to the second commitment period of the Kyoto Protocol i.e. discussions on the length of the commitment period and the text of the amendment of the Kyoto protocol at Doha and on that of transfer of AAU's, further underscored these fears. Developing countries instead called for continued focus on fulfilling the

mandate of the Bali plan by focusing on issues under it such as finance, technology, adaptation, capacity building and response measures, all of them pending action from the side of developed countries. Developing countries, particularly Venezuela, also said that countries that wanted to participate in the second commitment period should submit ambitious reduction targets (QELROS) in line with the global goal of limiting temperature increase to below 2°C. It is also worth noting that despite the developed countries claims to the contrary, not all the issues detailed in the agenda of the AWG-LCA were adequately addressed by the institutions established in previous COP summits. The ability of institutions such as the Green Climate Fund, the Technology Executive Committee, and the Adaptation Committee to address these issues is limited by their technical capabilities and their own mandates. Furthermore, they are hamstrung by the fact that many of these bodies are yet to be properly put into operation. An example of this is the \$100 billion Green Climate Fund, which is still not functional—and procedural issues ensured that its first board meeting could not take place at Bonn.

REDD+

An important feature of the negotiations at the Bonn Sessions was the discussions on REDD+ (reducing emissions from deforestation and forest degradation in developing countries, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries). Initially perceived primarily as a carbon offset program, Bonn has witnessed the emergence of a more detailed and nuanced view on the REDD+ initiative. The negotiations have also highlighted how corruption, poor governance frameworks and the influence of business interests are proving to be major hurdles to successful implementation. Since Bonn started, REDD+ was a key feature of the deliberations in the SBSTA and AWGLCA sessions as well as the positions held in the ADP by developing country groups such as the coalition of rainforest nations. Although these issues—issues related to finance and the setting up of Measuring, Reporting and Verification (MRV) systems with respect to the initiative—did not reach any conclusion through multiple informal consultations that took place exclusively on these matters, the multiple workshops and side events that took place on the sidelines of the main negotiations on various aspects of REDD warrants mention. At a SBSTA spin-off group dedicated to REDD+, parties had agreed on forwarding an annex to Doha on the views by held by them on MRV and national monitoring systems. In a similar group under the AWG-LCA track, with AWG-LCA Chair



AWG-LCA Chair Aysar Tayeb and Daniel Klein, Secretariat

Aysar Tayeb indicating that the secretariat would prepare a technical paper on the issue and will make efforts to organize a REDD+ workshop before Doha. However, persistent differences remained in matters related to monitoring and financing REDD+. Financing in particular saw major disagreements between countries. While most nations favoured using both public and private funding sources, which would be supplemented by market based approaches, countries such as Bolivia, Sudan, Tanzania and India differed, particularly with regard to the use of offsets in these market-based approaches.

CDM

The Clean Development Mechanism (CDM) was also discussed at Bonn under the SBSTA under three issues i.e. Carbon Capture and Storage (CCS), Forests in Exhaustion and LULUCF (Land use, Land use change and forestry). Under CCS, discussions focused on the eligibility of CO₂ projects which involved the transport of CO₂ from one country to another, eligibility of projects which involve geological storage sites in more than one country and the establishment of a global reserve of Certified Emission Reductions for CCS project activities. Significant progress was made on the last topic. On the issue of forests discussions were generally inconclusive and countries effectively postponed it for the next meeting. On LULUCF discussions focused on

issues related to accounting of emissions by sources and removals by sinks from LULUCF, procedures for possible additional LULUCF activities under the CDM and to address the issue of non-permanence under the CDM i.e. the reversal of emissions removals by sinks due to deforestation or natural disaster. The issue of non-permanence was highlighted particularly by Brazil, the EU and Belarus who discussed aspects such as liability for reversibility, proposals for buffers, and insurance.

Agriculture

Under the SBSTA mandate for Bonn, agriculture was to be discussed with the aim of adopting a decision by COP 18. In the consultations on the issue both developing and developed countries discussed assessing the present knowledge on climate change and agriculture, the need to improve knowledge sharing, improve agricultural productivity and resilience with relation to climate change and continue capacity building activities in developing countries. While discussing the need for technology transfers and workshops to improve production and ensure food security, developing countries also stressed the importance of adaptation and why it should be prioritised ahead of mitigation in the context of agriculture and climate change. The issue of adaptation in particular was the reason for a lack of progress on creating a technical paper on the issue. Countries such as Bolivia and the Philippines objected to its exclusion, while countries such as the US objected to it being the sole criteria for work on the issue. The issue will therefore be discussed in the next session of the SBSTA track.

Thus, with much of the work left unfinished at Bonn, negotiators will have an even higher workload than anticipated at Doha. While Bonn was not a significant stumbling block to climate negotiations, the problems it faced once again highlighted the challenges ahead in tackling climate change under the multilateral framework, with both developing and developed countries adopting the same tired negotiation positions throughout much of the event. The present reality is a far cry from the world of 1992 when the convention was first adopted. Despite the seeming unity showed by developing nations on the issue of equity, the ADP sessions clearly showed difference exist even amongst them. This was clearly in evidence in the disputes over the selection of officials for the ADP. The challenge therefore for negotiators going to Doha will be steep as they will not only have to contend with the major differences within countries, but also large number of issues that they will have to address in a limited time.

Hemant Nair

NEW MARKET MECHANISMS

- In this workshop, new market based mechanisms were discussed to better understand the multiple approaches countries had towards achieving their mitigation targets.
- Its purpose was to discuss ideas for a framework through which these approaches could be recognized by the UNFCCC and counted towards national pledges.
- Issues discussed included the feasibility of the proposed framework and how it could be made transparent and accountable, how to better differentiate market and non-market based mitigation approaches and how to tackle the problem of double counting.
- Double counting is the possibility of counting identical mitigation efforts across more than one mechanism, while counting a country's progress towards its mitigation pledges.
- To tackle this issue, New Zealand suggested having a declaration model where parties would declare their efforts towards mitigation and indicate how they represented genuine verifiable emissions reductions.

Energy sector biggest GHG emitters

Mean surface air temperature may rise by 3.5°C-4.3°C: NATCOM



IISD

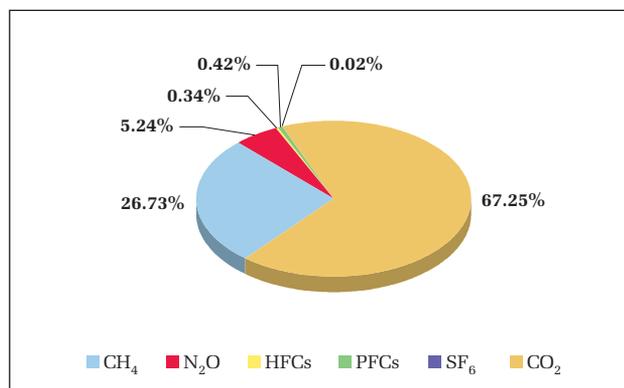
India's emissions in 2000 grew by 5.9 per cent compared to 1994, revealed India's emissions inventory report, released on May 9, 2012. Called NATCOM, acronym for National Communication, the report is a part of India's reporting obligation to the United Nations Framework Convention on Climate Change (UNFCCC). It provides details of India's greenhouse gas emissions, impacts and vulnerability assessments, and the measures that the country has undertaken to adapt to the changes. This is India's second official communication to the UNFCCC; the first was in 2004.

The report revealed that emissions in 2000 in India were 1.3 billion tonnes CO₂ equivalent. The energy sector was the highest overall emitter accounting for over two-thirds of India's emissions— 67.4 per cent—followed by agriculture (23.3 per cent), industrial processes (5.8 per cent) and waste (3.4 per cent). The report also provides an overview of India's land use, which has a significant bearing on the nature of India's climate change response mechanism. Over 200 scientists and experts from across India, combined into over 120 multi-disciplinary teams to work on various aspects of climate change, worked together to bring

out the report. The report says that of the total land use area, 46.1 per cent is used for agriculture. This is not surprising given that over 70 per cent of India's population continues to depend upon agriculture for their livelihood. The remaining land— 23.9 per cent—is under forest cover. According to the studies undertaken by the Ministry of Environment and Forests (MoEF), India's overall forest cover has increased in the past 10 years. The forest cover has increased from 6, 83,100 km² in 1994 to 6,90,899 km² in 2007. The rest of India's land use is divided between fallow land, and other uncultivated land, excluding fallow land that is not available for cultivation.

In its analysis of India's GHG inventory, the report examines the emissions of carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆) and their removal, by sinks. The sectors analysed include energy, industrial processes, agriculture, waste and land use, land use change and forestry (LULUCF) in 2000. India's emissions in 2000 were 1523777.44 Gg of CO₂ equivalent from all the sectors. This is excluding the LULUCF emissions, which were a net sink for the

FIGURE 1: Distribution Of Greenhouse Gas Emissions in 2000



Source: India, Second National Communication to the United Nations Framework Convention on Climate Change

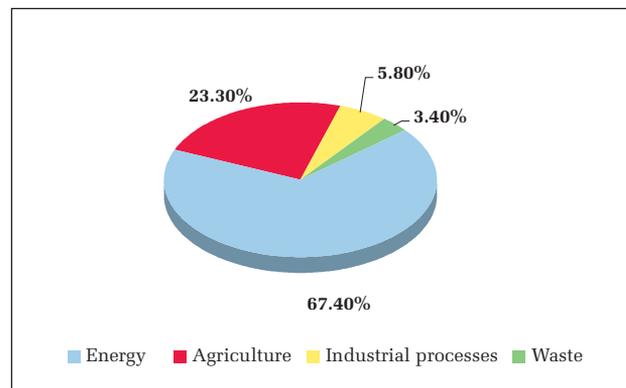
year 2000, absorbing 2,22,567.43 Gg of CO₂ equivalent. This means India's total GHG emissions in the year 2000 including LULUCF were 1301209.39 Gg of CO₂ equivalent. In terms of specific emissions, the emissions of CO₂ were the highest from the energy sector at 92.9 per cent of total CO₂ emissions (see figure 1). Similarly the emissions of CH₄ and N₂O were the highest from the agricultural sector at 73.0 per cent and 75.0 per cent of total emissions respectively. The emissions from the other gases i.e. HFCs, CFCs and SF₆ were entirely from the industrial processes sector.

The lion's share that the energy sector has within India's emissions profile (see figure 2) correlates directly to India's economic development between 1975 and 2005 (see figure 3). The growth of the economy was driven primarily by a higher rate of growth in energy intensive industries, with the rate of energy consumption growing at a rate higher than that of the country's GDP. In the past few years, India has been consistently averaging a growth rate of about 9 per cent, with the aggregate rate of investment going above 37 per cent of GDP in 2007-08. But despite this growth, according to the 2011 census, of India's over 246 million households, only 67.3 per cent have access to electricity. The issue however, is not the increase in energy consumption, but how to make it more efficient. While the report indicates that India's renewable energy accounts for 30 per cent of India's energy consumption, there is still a lot of potential for improvement.

Vulnerability assessment

In view of the many varied ramifications that climate change might have on the country, the report carried out an assessment of the possible impacts that climate change might have on areas such as water, forests, agriculture and health. According to the report, India currently has access to PRECIS, the

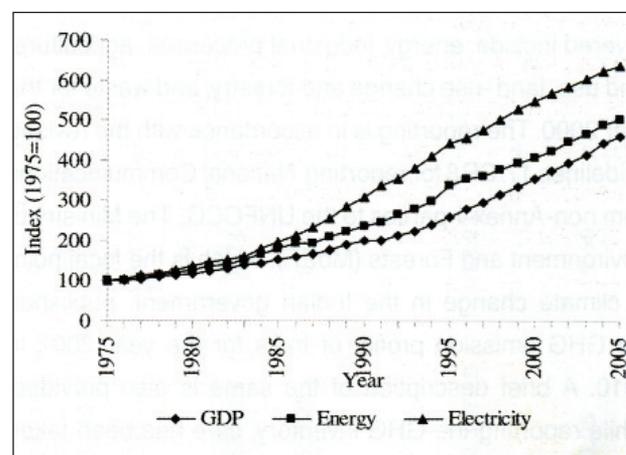
FIGURE 2: Greenhouse Gas Emissions by Sectors in 2000



Source: India, Second National Communication to the United Nations Framework Convention on Climate Change

latest generation of the Hadley research centre's models. Also, of the emissions scenarios presented by the Intergovernmental Panel on Climate Change (IPCC), the A1B scenario was chosen for the report as it shows high technological development, with the use of renewable energy technologies following a sustainable growth trajectory. Climate change scenarios were analysed using the PRECIS model for the A1B scenario in three QUMP (Quantifying Uncertainties in Model Projections) for the period 1960-1990 as a baseline and for three other periods i.e. 2011-2040, 2041-2070 and 2071-2098 in order to generate future climate change projections for the coming century. The parameters analysed included rainfall, mean sea level and surface air temperature. They indicated that while there will not be significant drop in rainfall in the coming century, the sub-continent is likely to get warmer as the mean surface air temperature is likely to rise between 3.5°C-4.3°C.

FIGURE 3: Growth of Energy, Electricity & Economy



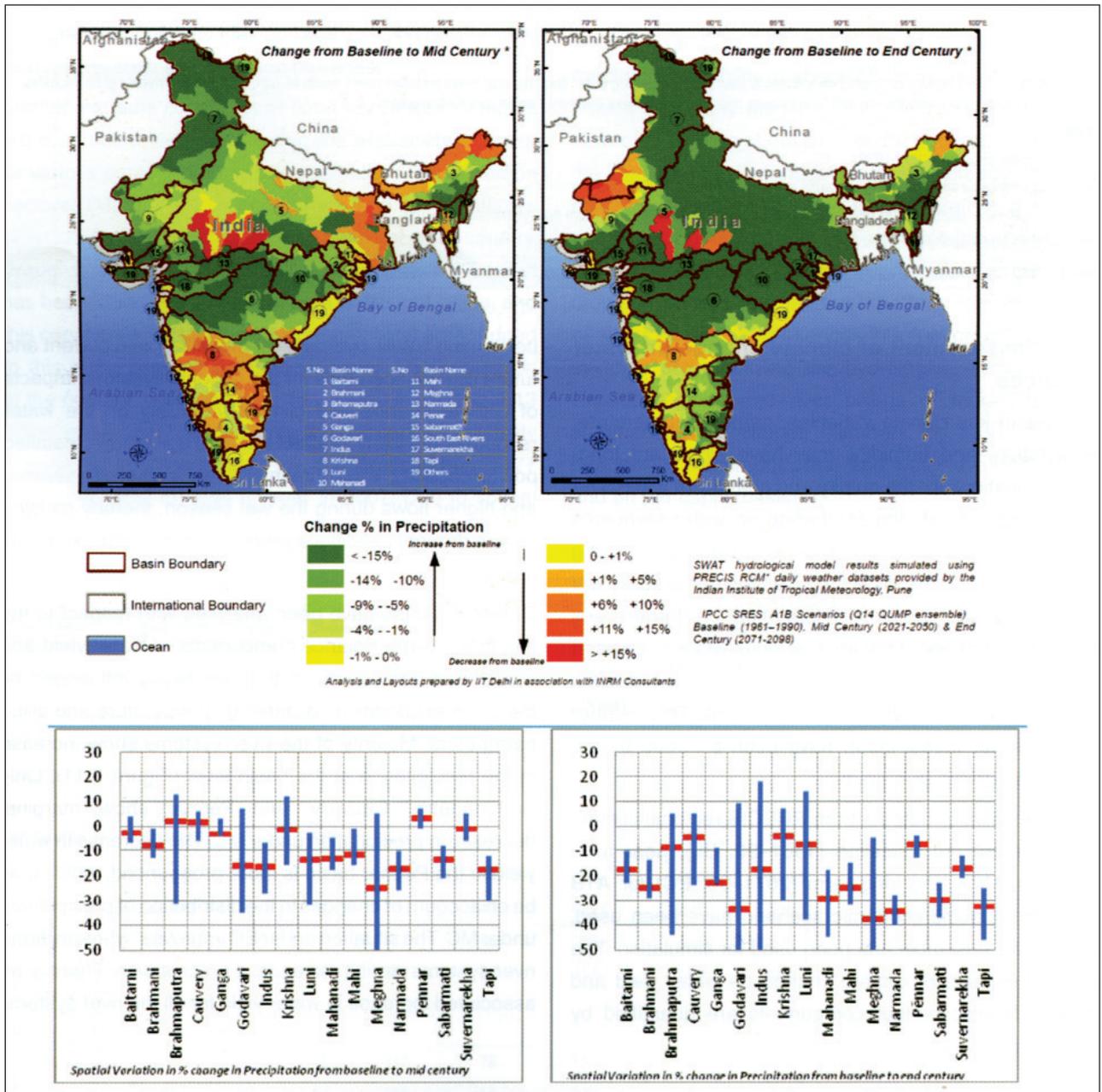
Source: Economic Survey of India, 1991-2006, CMIE, 2003-2007; Central Statistical Organisation (CSO), 2006

Impact: Water

In its projections on the various climate change scenarios in India, the report has assessed the impact it would have in four different areas—water resources, forests, agriculture and health. The 1960-90 figures are the baseline scenario along with projections for the near term (2021-2050) and the long term (2071-2098). With regard to water, the report has produced detailed analysis of the two major components of water balance, water yield and actual evapo-transpiration (ET), which are highly influenced by changes in weather and temperature patterns. In the near term a majority of the river systems,

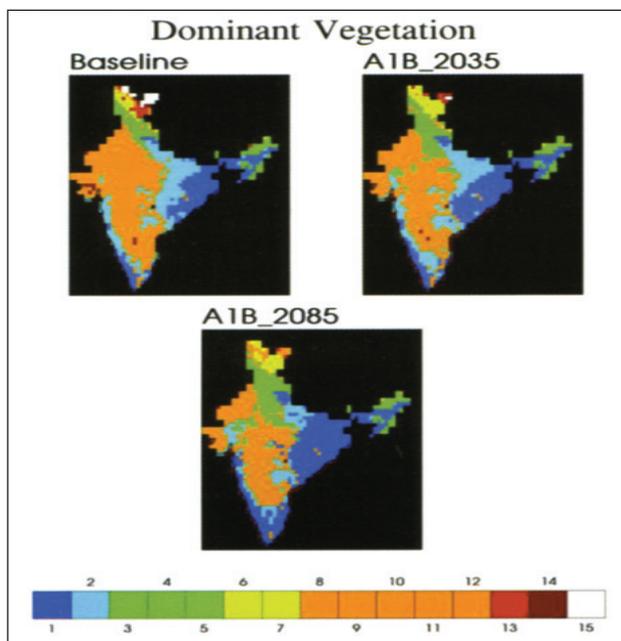
except the Brahmaputra, Cauvery and Pennar show an increase in precipitation at the basin level (see Figure 4). However, in the long term all the rivers show an increase in precipitation. The Brahmaputra, Indus and Luni rivers show an increase of 10 per cent in the medium term for ET, with only marginal changes in other systems. In the long-term, except for the Cauvery and Krishna (which actually decrease), all other river systems increase their ET 40 per cent on account of a rise in temperatures and precipitation, increase in ET means that water demand for agriculture will increase in the future. This has implications for the

FIGURE 4: Change in Precipitation towards 2030s & 2080s with respect to 1970s



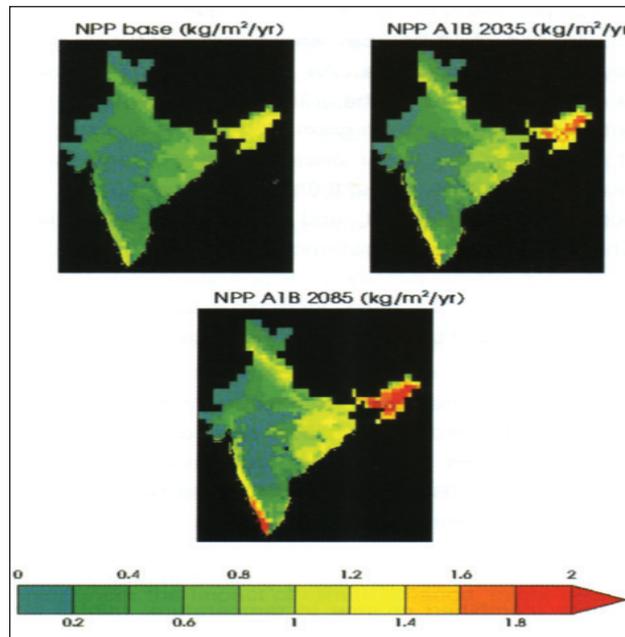
Source: India, Second National Communication to the United Nations Framework Convention on Climate Change

FIGURE 5: Forest type distribution & extent simulated for Baseline case and A1B case scenarios (2035 & 2085).



Source: India, Second National Communication to the United Nations Framework Convention on Climate Change

FIGURE 6: NPP Distribution (kgC/m²/year) simulated by IBIS for baseline and A1B Scenarios



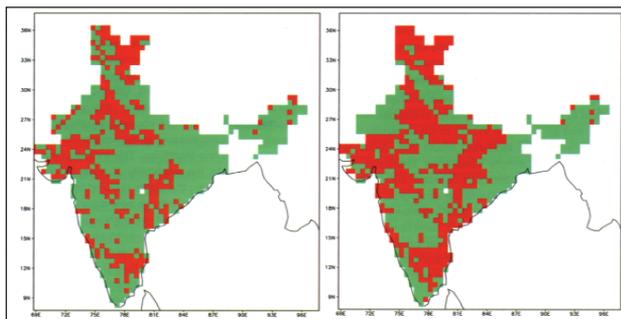
Source: India, Second National Communication to the United Nations Framework Convention on Climate Change

food security of the country.

Impact: Forests

The next area of impact examined by the report includes forests, which are examined according to changes in area under different forest types, shifts in boundary of forest types and the net primary productivity (NPP). The simulations carried out treated 1960-91 as the baseline year, with other two time frames of 2021-2050 (atmospheric CO₂ concentration reaches 490ppm) labelled as 2035 and the second 2071-2098 (atmospheric CO₂ reaches 680ppm), labelled as 2085. The figures in the report indicate an expansion of tropical evergreen forests

FIGURE 7: Vulnerable grids (marked red) in the A1B Scenario. Left panel is for 2021-2050 (30.6% vulnerable grids). The right panel is for 2071-2100 (45.9% are vulnerable)



Source: India, Second National Communication to the United Nations Framework Convention on Climate Change

in the eastern India plateau and the Western Ghats, with an expansion of forests in the western part of central part of India. The NPP (See Figure 6) seems to increase all over India for the A1B scenario. It increases by an average of 30.3 per cent by 2035, and by 56.2 per cent by 2085. A combination of a predicted warmer and wetter climate in the north-east has led to a higher increase there. Due to the vulnerable nature of forests to climate change, the report developed a vulnerability map of India's forests to assess the vulnerability of India's forests. On the map a grid would be considered vulnerable if there was a change in the vegetation between the baseline and the 2035 and 2085 time frames. The map (see Figure 7) indicated that vulnerability increased from 30.6per cent in the 2035 time frame to 45.9per cent in the 2085 time frame. What these figures imply is that the future climate in the vulnerable regions could have an adverse impact on the growth of vegetation in these grids.

Impact: Agriculture

On agriculture, the report utilizes a combination of simulations and field studies as well as historical data to analyse the various impacts that climate change can have on Indian agriculture. The report mentioned that for the simulations researchers utilized an InfoCrop Model which is a crop simulation that simulates the effects of weather, soil, agronomic management and the impact of pests on crop yield and the possible environmental impacts. In

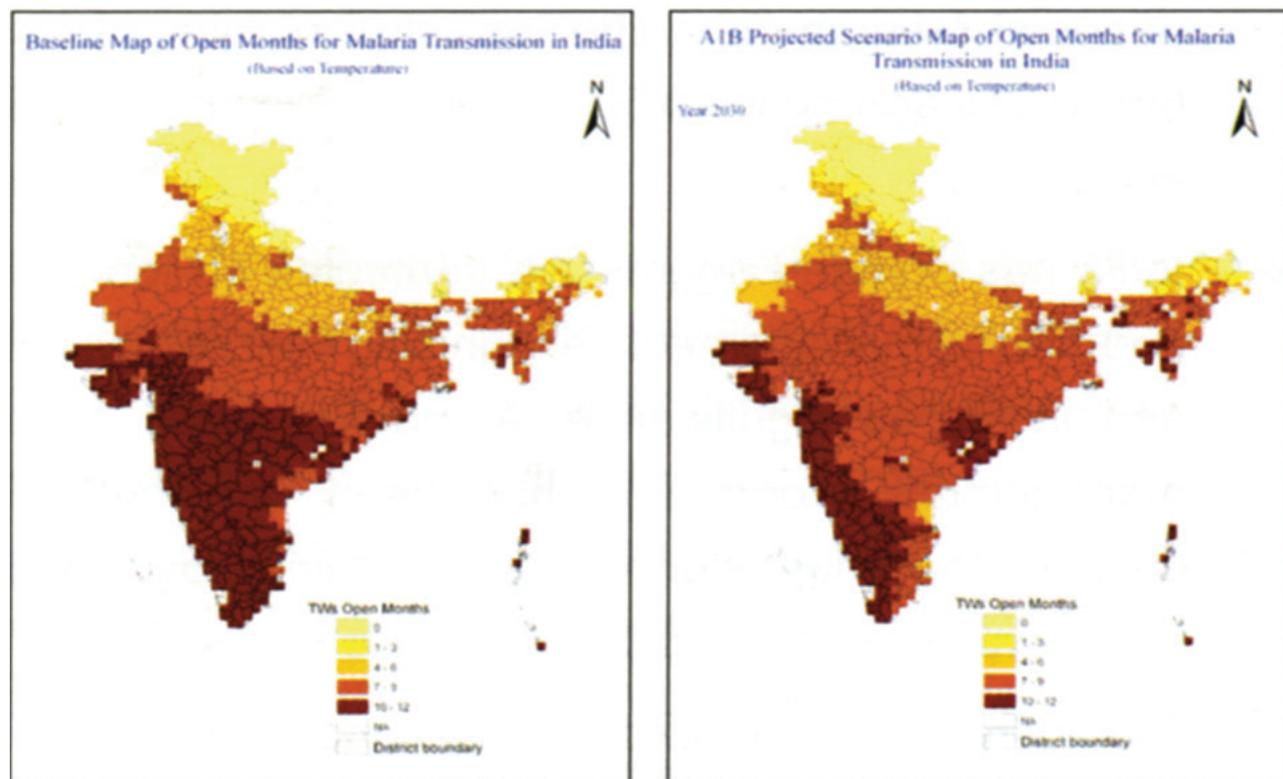
the case of plantation crops such as cocoa and coconut, information obtained from studies done in controlled environments was used to modify data retrieved from simulation models. Regression models were then developed to study the impact on productivity. Based on the simulations conducted a rise in atmospheric carbon dioxide by 550 ppm under controlled environmental conditions [Free Air CO₂ Enrichment - FACE, Open Top Chambers (OTC)] led to an increase in the yield of wheat, chickpea, green gram, pigeon pea, soybean, tomato and potato between 14 per cent and 27 per cent due to an increase in storage organs of the crops i.e. the organs it utilizes to store energy or water. However, this was also accompanied by a reduction in protein content (2-10 per cent). Higher levels of CO₂ led to higher biomass in plantation crops such as coconut, areca nut and cocoa. With regard to wheat production, the report indicated that by implementing simple adaptive strategies such as changing the planting date and the variety of seed are used; even a 1°C increase in temperature would not lead to significant loss in wheat production. However, the report cautioned that the benefits of these adaptive strategies would gradually reduce if the temperature rise were to go to 5°C and beyond. But, in the absence of these adaptive strategies, even an increase of 1°C may lead to decrease of 6

million tonnes in wheat production. The report also indicated that changes in temperature and precipitation would lead to a greater decrease of cotton production in northern India than southern India. Also, due to the projected increase in rain and the stimulating effects of CO₂ there would be less of an impact on cotton production overall due to climate change. Also plantation crops such as cocoa and coconut are likely to be positively influenced by a rise in temperature with an increase of 1°C leading to an improvement of 100 kg of dry beans/ha for cocoa. However, in the case of vegetables, particularly onions and tomatoes, the increase in climate variability will have an adverse impact on their production due to their high sensitivity to temperature variability. Recent estimates indicate that India loses about 1.8 million tonnes of milk every year due to climatic stresses and the report indicates that this figure will increase by 1.6 million tonnes in 2020 and more than 15 million tonnes by 2050.

Impact: Health

Finally, the report also conducted an analysis of the impact of climate change on the transmission of malaria in the country. This was done by compiling monthly assessments of transmission windows (TW) of the disease in India, and understanding when they were open and closed in the country.

FIGURE 8: Projection of open transmission window of malaria by 2030 (based on temperature and A1B Scenario)



Source: India, Second National Communication to the United Nations Framework Convention on Climate Change.

Utilizing two scenarios where only temperatures were taken then temperatures and relative humidity, TWs have been generated for the baseline scenario of (1960-1990) and for the years 2030, 2071, 2081, 2091 and 2100 (see Figure 8 & 9).

In projections for 2030 the report indicates that based on temperature alone, the TWs of Malaria seem to increase across the country especially in the south where TWs of 10-12 months were visible. Even in states like Jammu & Kashmir and Himachal Pradesh in the north, TWs which were not open to transmission in the baseline scenario are open in the 2030 scenario. However, in projections that utilized both temperature and relative humidity, the percentage of high TW figures goes down. While some states such as Tamil Nadu and Karnataka recorded TWs of 7-9 months and 10-12 months, for a majority of the country the TWs are between 1-3 months and 4-6 months.

Gaps and constraints in research

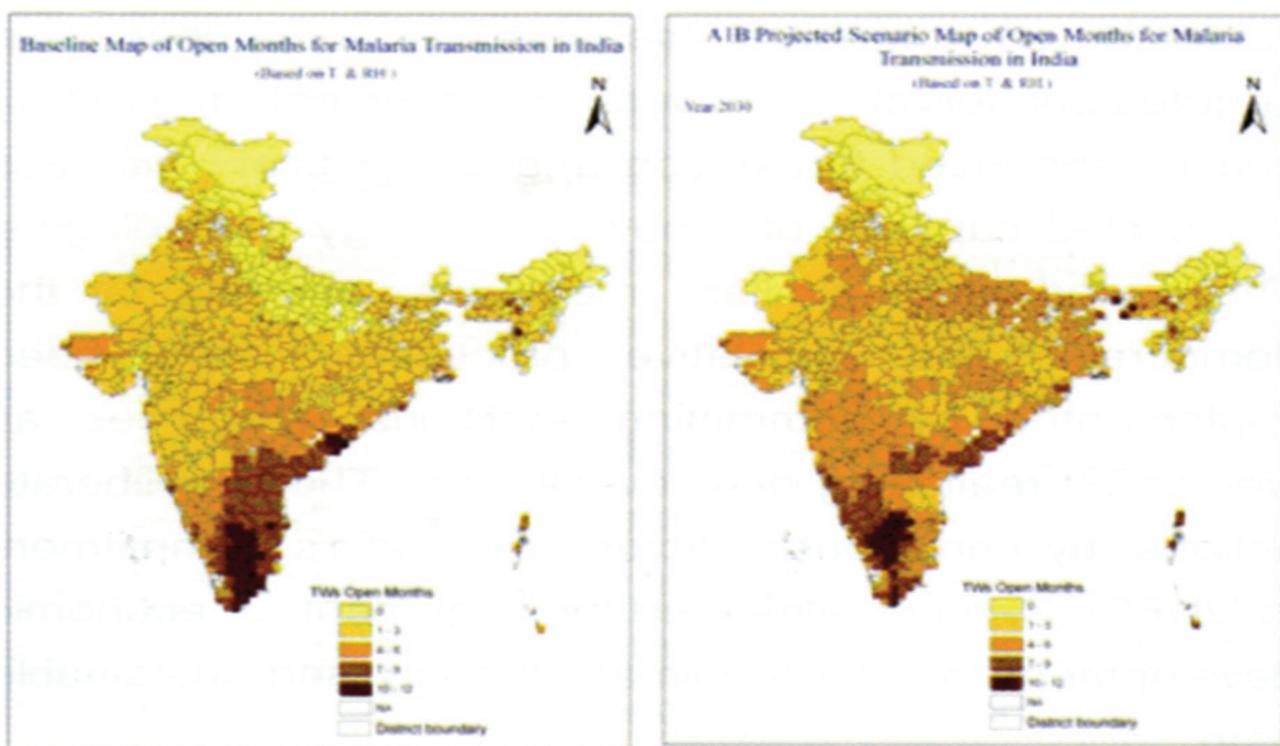
The NATCOM report also contains a broad overview of the programmes that India has undertaken with a view to furthering sustainable development. This includes a summary of India's National Action Plan on Climate Change (NAPCC) as well as further details of India's 12th Five Year Plan (2012-2017) which has kept the idea of 'Low Carbon Growth' as one of its key features. The report also provided a

summary of the organizations that are working on improving climate research in India as well as the steps the government of India has undertaken to improve its response mechanism to climate change and increase awareness of it in the country. The report, however, admitted to the following gaps and constraints:

- Constraints in data organization, especially with lack of availability of GHG inventory data in IPCC formats as well as a mismatch in available data-sets across documents for sectoral analysis.
- Lack of availability of some data sets such as information on the informal sector, which constitutes a large part of India's workforce. There was also a lack of data to refine the inventory to higher tier levels.
- Lack of access to data sets due to security concerns, lack of electronic, procedural delays and protecting information under the banner of trade secrets.
- Lack of technical capacity in institutions involved in data generation for inventory and linking with climate research.
- Small sample size for representative emission coefficient measurements in many sub-sectors.
- Lack of resources to sustain National Communication networks.

Hemant Nair

FIGURE 9: Projection of open transmission window of malaria by 2030 (based on temperature and Relative Humidity and A1B Scenario)



Source: India, Second National Communication to the United Nations Framework Convention on Climate Change.

RESEARCH FUNDING OPPORTUNITIES:

1. Agropolis Foundation – Call for Proposals "Open Science" 2012: Agropolis Foundation is a French grant-making organization that supports inter-disciplinary research and higher education in agricultural sciences and sustainable development. Agropolis invites international partners to collaborate with scientists at Agropolis by means of the Foundation's fellowships and grants. The Foundation describes each type of award by purpose, eligibility criteria, level of financial support, and other details. Materials are available in French and English.

More Information on-
<http://tinyurl.com/covqkvh>

Deadline: 14 September 2012.

2. Asia-Pacific Network for Global Change Research (APN) – Call for Proposals 2012: APN has launched its 2012 call for proposals in its two program areas. (i) The Annual Regional Call for Proposals (ARCP) supports research on physical, biological, and human dimensions of change in the Earth's systems. (ii) The CAPaBLE program focuses on training, awareness raising, and partnerships in these themes. Proposals in ARCP should involve at least three APN member countries, two of which should be developing countries. Proposals in CAPaBLE should build scientific capacity in at least one developing country of the Asia-Pacific region.

More information on:

<http://tinyurl.com/84mznf4>

Deadline for both programs:

August 12, 2012

3. Ashden International Awards for Sustainable Energy – Awards 2013: The Ashden International Awards support projects in sustainable energy in Africa, Asia, and Latin America and the Caribbean. The annual competition is open to businesses, nonprofit organizations, NGOs, and social enterprises. Up to six winners will receive £20 thousand each in prize money, with one winner receiving a gold award of £40 thousand.

More Information On:

<http://tinyurl.com/cwdc38e>

Deadline: October 23, 2012

4. European Commission Call for Proposals: Environment and Sustainable Management of Natural Resources:

The European Commission under the Thematic Programme for Environment and Sustainable Management of Natural Resources including Energy (ENRTP) has issued this call for proposals to support civil society efforts in developing countries to address environmental and natural management issues. The present call will focus on themes that fall under two Priority areas of the Thematic Strategy ENRTP i.e. ENTRP Priority 1: Climate Change and sustainable energy and ENTRP Priority 2: Environment for Development.

More Information on-

<http://tinyurl.com/cn9nc7b>

Deadline: September 25, 2012

5. 2012 IPCC Scholarship programme for developing countries students, Switzerland:

The Intergovernmental Panel on Climate Change (IPCC) offers scholarship for PhD students from developing countries in the fields of Socio-economic modeling related to climate change, Underlying science of climate

change or Climate change and water, Switzerland 2012. The Call for Applications is open to candidates fulfilling the following requirements: Post-Graduate students at PhD level, accepted at a recognized educational institution to start studies in 2013, or currently enrolled on continuing PhD courses. Applicants must be younger than 30 years of age at the time of application and must be nationals of developing countries.

More Information on-

<http://tinyurl.com/cd3n6tb>

Deadline: September 30, 2012

6. Belmont Forum-International Opportunities Fund: The International Opportunities Fund will provide about €20 million to support global research on (i) coastal vulnerability, and (ii) freshwater security. The countries in this initiative are Australia, Brazil, Canada, France, Germany, India, Japan, Russia, South Africa, UK, and USA. Some of these countries may also support participation from developing countries. Consortia will consist of partners from at least three participating countries – and bring together natural scientists, social scientists, and research users. Projects will be funded at €1 million to €2 million for two or three years.

More information on-

<http://tinyurl.com/cshco2v>

Deadline Pre-Proposals: July 20, 2012

7. Prince Albert II Foundation – Pre-Applications in 2012: The Prince Albert II of Monaco Foundation makes grants for global environmental stability in themes of climate change, biodiversity, access to water, and the fight against desertification. Its geographical priorities are the Mediterranean Basin, the Polar Regions, and the Least-Developed

Countries. The next round of pre-applications for grants will be **15 October 2012 through 16 November 2012.**

More information on-

<http://tinyurl.com/6lj47s9>

8. Brazilian National Council for Scientific and Technological Development (CNPq) and TWAS – Research Fellowships in Brazil: In collaboration with the Academy of Sciences for the Developing World (TWAS), Brazil's CNPq offers

research support to scientists from developing countries (other than Brazil) to study or do research in natural sciences in Brazil. The program offers post-doc fellowships, full-time PhD fellowships, and sandwich PhD fellowships. CNPq has programs in biodiversity, ecology, marine sciences, and many others.

More information on-

<http://tinyurl.com/78cwg6>

Deadline: July 19, 2012

9. International Food Policy Research Institute (IFPRI) – Fellowships on Gender and Agriculture: IFPRI is col-

laborating with Oxford University and the U.S. Government to support PhD research on the Women's Empowerment in Agriculture Index (WEAI). The research will strengthen understanding and evidence of the WEAI as a measure of women's empowerment and inclusion levels in agriculture. The research should focus on one or more countries in the program "Feed the Future" – referenced in the announcement. Applicants must be full-time Ph.D. students in the social sciences or humanities. There are no requirements by nationality or residence.

More information on-

<http://tinyurl.com/86qyxmv>

Deadline: July 31, 2012

10. United Nations Development Program (UNDP): Asia-Pacific Development Fellowships. The UNDP offers academic fellowships and media fellowships to promote understanding of human development. The academic fellowships aim to support young PhD students from developing countries in the Asia-Pacific region to analyze critical development issues within this year's theme of "Embedding Environmental Concerns into Poverty Reduction and Inclusive Growth." The media fellowships aim to bring people in the Asia-Pacific region to the center of development debates within this year's theme of "Climate Change."

Deadline: September 15, 2012

More Information on-
<http://tinyurl.com/7rc2296>

FUTURE MEETS

1. Additional Session of the Ad Hoc Working Groups: This meeting will include sessions of: the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP); the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA); and the Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP). These sessions will be preceded by preparatory meetings of the Group of 77 and China, the African States, the small island developing States (SIDS), and the least developed countries (LDCs), from 24-29 August 2012. No side events and exhibits will be held during the sessions.

Bangkok (Krung Thep), Thailand;

30 August - 5 September 2012

More information on-
<http://tinyurl.com/7gost6g>

2. World Urban Forum 6 (WUF 6): This Forum will focus on the theme "The Urban Future," and will feature six thematic open dialogues, including one on environment, urban mobility and energy. WUF 6 will also include a series of roundtables conducted by different peer groups, a World Urban Youth Assembly, a Gender Equality Action Assembly, and a Business Assembly. Mostra d' Oltremare, Napoli (Campania), Italy;

1-7 September 2012

More Information on-
<http://tinyurl.com/8y6n5s7>

3. Second Global Conference on Agriculture, Food Security and Climate Change: The second Global Conference on Agriculture, Food Security and Climate Change, which will include a High-Level Meeting, is co-organized by the Governments of Viet Nam and the Netherlands, in collaboration with other partners, including the World Bank and the Food and Agriculture Organization of the UN (FAO). The meeting is organized around the theme "Hunger for Action" and will take stock of the implementation of the Roadmap for Action established at the 2010 conference in The Hague, the Netherlands, and set new and more concrete priorities for action while demonstrating early action on climate-smart agriculture as a driver for green growth.

Hanoi (Ha Noi), Viet Nam;

3-7 September 2012

More information on-
<http://tinyurl.com/d8nnp5t>

4. 19th Meeting of the Adaptation Fund Board: The Adaptation Fund Board supervises and manages the Adaptation Fund under the authority and guidance

of the countries that are party to the Kyoto Protocol. The Board is composed of 16 members and 16 alternates: two representatives from each of the United Nations regional groupings; one representative of the small island developing States; one representative of the least developed country parties; two other representatives from Annex I parties; and two other representatives from non-Annex I parties.

**Bonn (Nordrhein-Westfalen), Germany;
13-14 September 2012**

More information on-
<http://tinyurl.com/ckpz33d>

5. Presentation of the CDM Policy Dialogue Report:

The CDM Policy Dialogue was launched to review past Clean Development Mechanism (CDM) experience and help ensure the CDM is ready to meet the challenges of the post-2012 period. The report of the dialogue will be presented during the 69th meeting of the CDM Executive Board.

**Bonn (Nordrhein-Westfalen), Germany;
17-21 September 2012**

More information on-
<http://tinyurl.com/7gost6g>

6. Third Symposium on the Ocean in a High-CO2 World:

This symposium is sponsored by the Scientific Committee on Oceanographic Research (SCOR), the Intergovernmental Oceanographic Commission (IOC) of the UN Educational, Scientific and Cultural Organization (UNESCO), and the International Geosphere-Biosphere Programme (IGBP). The symposium aims to attract over 300 of the world's leading scientists to discuss the impacts of ocean acidification on marine organisms, ecosystems, and biogeochemical cycles. It will also cover socioeconomic consequences of ocean acidification, including policy and management implications. Monterey (California), United States of

America; **24-27 September 2012**

More information on-
<http://tinyurl.com/7y37nz3>

7. Eighth Session of the Open-ended Working Group (OEWG 8) of the Basel Convention:

The Open-ended Working Group (OEWG), one of the subsidiary bodies of the Basel Convention, seeks to: assist the Conference of the Parties (COP) in developing and keeping under continuous review the implementation of the Convention's work plan, specific operational policies and decisions taken by the COP for the implementation of the Convention, as specified in article 15; consider and advise the COP on issues relating to policy, technical, scientific, legal, institutional, administration, finance, budgetary and other aspects of the implementation of the Convention within the approved budget; prepare its work plan for consideration by the COP; and report to the COP on the activities it has carried out between meetings of the COP.

**Geneva (Geneve), Switzerland;
25-28 September 2012**

More Information on-
<http://tinyurl.com/7nbpoep>

8. UNU-WIDER Conference on Climate Change and Development Policy:

The UN University (UNU)-World Institute for Development Economics Research (WIDER) conference on "Climate Change and Development Policy" aims to reflect the diverse range of perspectives on how to balance climate and development objectives. The conference will evaluate how research can inform development policy and identify existing knowledge gaps. Researchers and policy makers will be brought together to advance knowledge of development and climate change. The conference focuses on both low-carbon development (mitigation) and climate-resilient strategies (adaptation).

**Helsinki (Southern Finland), Finland;
28-29 September 2012**

More information on-
<http://tinyurl.com/7xcnovt>

9. CBD COP 11: The 11th meeting of the Conference of the Parties (COP 11) to the Convention on Biological Diversity (CBD) is organized by the CBD Secretariat. The High Level Segment will be held from 17-19 October 2012.

**Hyderabad (Andhra Pradesh), India;
8-19 October 2012**

More information on-
<http://tinyurl.com/7tblhv6>

10. Fourth International Conference on Drylands, Deserts and Desertification: Implementing Rio+20 for Drylands and Desertification: The Jacob Blaustein Insti-

tutes for Desert Research, along with the UN Educational, Scientific and Cultural Organization (UNESCO), the UN Convention to Combat Desertification (UNCCD) and the Israeli Foreign Ministry, are organizing the Fourth International Conference on Drylands, Deserts and Desertification (DDD). This conference will gather scientists, field workers, industry representatives, government workers, civil society organizations, international development aid agencies and other stakeholders from over 60 countries to discuss issues related to land degradation in the drylands, and their sustainable use and development.

Sede Boqer campus of Ben Gurion University, Israel; 12-15 November 2012

More information on-
<http://tinyurl.com/7r4cz6k>

ABOUT US

Indian Climate Research Network is a collaboration of Centre for Science and Environment, Indian Institute of Technology Delhi, Indian Institute of Technology Madras and Indian Institute of Science in Bangalore.

The main goal of the network is to enhance capacity for climate research and action in India. It also aims to achieve the following:

- Develop an arena for promoting interaction among researchers, analysts, and practitioners from across the country
- Enhance understanding of the current state of activities and research capabilities in the country and thereby identifying key lacunae
- Deepen and broaden engagement on the climate issue with a particular focus on smaller academic institutions, NGOs and younger scholars
- Strengthen a sense of 'community' among researchers
- Explore ways to more effectively link climate research and action programmes

*For more information
on the network, contact:*

*Indrajit Bose/Hemant Nair
Centre for Science and Environment
41, Tughlakabad Institutional Area
New Delhi 110062
Email: icrn@icrn.in*

ICRN

INDIAN CLIMATE RESEARCH NETWORK

An initiative of IIT Delhi, IIT Madras, Indian
Institute of Science Bangalore and CSE.