Norad Report 13/2009 Discussion

Norad

Review of the Embassy's Development Assistance Portfolio: Climate Change and Environment "Climate Proofing and Greening of the Portfolio"

The Royal Norwegian Embassy,

New Delhi, India

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FINAL REPORT

The Royal Norwegian Embassy,
New Delhi, India

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Climate Change and Environment

"Climate Proofing and Greening of the Portfolio"

25. May 2009

Norad

PREAMBLE

The Royal Norwegian Embassy in New Delhi (the Embassy) has requested the assistance from Norad to undertake a Review of the Embassy's portfolio to identify possible ways and means of addressing/integrating appropriate climate change and environmental concerns in existing programs and projects supported by Norway. The Review was commissioned in response to the increased priority given to climate change and environment in Norwegian development cooperation policy. This Review is intended to contribute to "climate proofing" and a "greening" of the Embassy's portfolio. After request from the Embassy, the Review Team also engaged in discussions on the Embassy's draft strategy for Indo-Norwegian Collaboration on Energy, Climate Change and Environment, and provided input to the Embassy's efforts to reduce the environmental and climate change footprints of the Embassy's operation.

The Embassy has been mandated by the Norwegian Government to promote cooperation with India on environment, energy and climate change at the government level, between institutions, and business-to-business. The overall goal of these efforts can be said to be dual: to have real impact in supporting low carbon solutions for economic development in India/assist India meeting the challenge of climate change, and at the same time contribute to reaching Norwegian national targets.

The Review Team was comprised of Hans Olav Ibrekk and Mari Sofie Furu, both Norad staff. The Team undertook a visit to New Delhi 2 – 6 March 2009. The review is based on desk studies, review of relevant literature and discussions with Embassy officials and counterparts in India. The Team appreciates the assistance and hospitality given by the Embassy.

The Embassy submitted comments on the report to Norad 15. May 2009. Based on the received comments and suggestions the Review Team prepared the final report.

The Review Team has provided its independent recommendations and this does not indicate any commitment on behalf of the Embassy to provide additional funding. Based on the review the Embassy is expected to prepare a follow-up plan based on the annual business planning cycle.

25. May 2009

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LIST OF ABBREVIATIONS

AD	Appropriation Document
ASHA	Accredited Social Health Activist
Bioforsk	Norwegian Institute for Agricultural and Environmental Research
BRICs	Brazil, Russia, India and China
DALY	Disability-Adjusted Life-Year
CCS	Carbon capture and sequestration/storage
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CO_2	Carbon dioxide
CSR	Corporate Social Responsibility
DNA	Designated National Authority
DST	Department of Science and Technology
EIA	Environmental Impact Assessment
EMP	Environmental management plans
FAO	United Nations Food and Agricultural Organization
GCM	Global Circulation Models
GDP	Gross Domestic Product
GHGs	Greenhouse gases
GIS	Geographical information system
GLOFs	Glacial Lake Outburst Floods
GMO	Genetically modified organisms
GoI	Government of India
HICIAA	Himalayan Climate Impact and Adaption Assessment
ICG	Institute of GeoHazards
ICIMOD	International Centre for Integrated Mountain Development
IDS	Institute for Development Studies
IITK	Indian Institute of Technology
ILO	International Labour Organization
IMD	Indian Meteorological Department
IN	Innovation Norway
IPCC	Inter-Governmental Panel of Climate Change
IPRC	International Pacific Research Centre (IPRC), University of Hawaii
ITN	Insecticide treated bed nets
JV	Joint venture
JWG	Joint Working Group
MDG	Millennium Development Goal
MFA	Norwegian Ministry of Foreign Affairs
MMP	Match Making Program
MoU	Memorandum of Understanding
MTR	Mid-Term Review
MW	Mega Watt
NAPA	National Adaptation Programme of Action
NAPCC	National Action Plan on Climate Change
NC	Norwegian Concerts
NCP	National Contact Points
NGO	Non-Governmental Organization
NIPI	Norway-India Partnership Initiative
Norad	Norwegian Agency for Development Cooperation
NRHM	National Rural Health Mission
NVE	Norwegian Water Resource and Energy Directorate
ODA	Overseas Development Assistance

PD	Project document
PES	Payment for ecosystem services
PPP	Public-private partnership
PSD	Private Sector Development
R&D	Research and Development
REDD	Reducing deforestation and forest degradation
SEA	Strategic Environmental Assessment
SM	Spic Macay
SRI	System of Rice Intensification
TERI	The Energy and Resources Institute
TOR	Terms of Reference
UNFCCC	United Nations Framework Convention for Climate Change

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

The Royal Norwegian Embassy in New Delhi (the Embassy) requested Norad to undertake a Review of the Embassy's portfolio to identify possible ways and means of addressing/integrating appropriate climate change and environmental concerns in existing programs and projects. The Review also included discussions on the Embassy's draft strategy for Indo-Norwegian Collaboration on Energy, Climate Change and Environment, and issues related to the Embassy's efforts to reduce the environmental and climate change footprints of the Embassy's operation. Environment, energy and climate change are the key areas in the development cooperation between Norway and India as well as a large health sector program (Norway – India Partnership Initiative (NIPI)).

Overall, the review has documented scope to strengthen the environment dimension, e.g. '**do good'**, in several projects. Within the NIPI-program there seems to be scope to increase efforts on environmental health related interventions to complement the NIPI-supported activities. Several of the climate change focused activities also offer possibilities of greening. The issue of environmental safeguarding, i.e. '**do no harm**', is adequately addressed. None of the activities reviewed would be subject to environmental assessment.

In terms of support to **climate change** the Embassy has developed a portfolio of activities targeting mitigation as well as adaptation. Norway is a small donor, and need to use our resources in a smart and targeted manner in order to influence the climate change agenda in India and achieve the intended results. Therefore the Embassy's strategy should focus on key areas/niches where Norway can make important contributions, rather than be an all encompassing strategy. A long-term, overall goal could be to assist India in its planned directional shift in the development pathway to a low-carbon economy, and through institutional cooperation and private sector development to increase the understanding of climate change, adaptation and mitigation, energy efficiency and natural resource conservation, thereby supporting the implementation of the Norwegian climate change policy. More specifically the strategy could focus on three areas:

i. Support to selected priority areas guided by the National Action Plan for Climate Change (NAPCC) (launched in June 2008);
ii. Support initiatives based on Norwegian Climate change priorities, e.g. CCS and green ships.
iii. Engage in an active political dialogue on climate change with a view to developing mutual understanding on key areas.

Currently, the Embassy is not supporting any project related to Reducing Emissions of Deforestation and Forest Degradation (**REDD**). India's NAPCC has a National Mission for a "Green India". The Embassy should carefully consider the feasibility of engaging in REDD-related cooperation with India, primarily through multilateral channels and research and development (R&D) cooperation.

Several of the projects focus on assessing impacts of climate change on key sectors and related possible **adaptation** measures. Without being able to cope with the existing **climate variability** India will not be able to deal with the additional variability caused by climate change. Furthermore, natural disasters also put additional strains on the economy and livelihoods. The frequency of **natural disasters** is expected to increase, and India needs to focus their efforts to reduce the impacts of these. The Embassy could in its dialogue with project partners focus on the key importance of designing projects to reduce vulnerability to climate variability and natural disasters and means to increase communities resilience.

Climate change will affect, in profoundly adverse ways, some of the most fundamental determinants of **health**: food, air and water. Through the NIPI program Norway can sensitize

policy planners and decision-makers regarding the health risks due to exposure to extreme events, climate variability, and the potential impacts of climate change. It is suggested that the issue of existing climate change, climate variability, natural disasters and potential impacts on the health sector is included in the overall policy dialogue at appropriate points. This can raise awareness and understanding of the need for the health system in India to start considering immediate implication of climate variability and long-term implications on health service delivery of climate change.

The NIPI program's primary focus is on pre-natal health care support. Without a clear focus on hygiene, sanitation, water supply and nutrition within the National Rural Health Mission (NRHM) the intended reductions in under five-mortality are not likely to be achieved. To bolster the effects of the program, focus on environmental health affecting all under five children could be included. A number of environmental health interventions would support the achievements of the overall objectives of the NIPI program. The Embassy should in its dialogue with NIPI bring up the issue of environmental health interventions and the importance of focusing on these. There is also a need to ensure that the various training programs provided by NIPI also include issues related to hygiene, sanitation, water supply and energy use. The Embassy should explore the possibility of including NIPI villages in the planned solar energy public-private partnership project.

The possibility to influence the interest of Indian and Norwegian private sector to concentrate on specific sectors could be limited; however, through aligning the strategy for **support to private sector** – including both Innovation Norway and the Embassy – with the key priority areas for Norwegian cooperation with India, Norway could be a more coherent actor. A strong case could be made to more explicitly align private sector support to clean energy, climate and environment, bearing in mind that Norway has a limited number of companies catering to niche segments in this market.

Cultural cooperation can be used to facilitate a dialogue platform for environmental and climate changes issues. Music and visual arts can be effective media to promote various messages to the broader public. The cultural exchange program's focus of children and youth makes it a potentially effective platform for reaching this important population group with messages related to environment, climate change and common values.

The Embassy is in the process of designing an extension of the existing buildings on the Embassy compound to respond to needs for more space. This presents an opportunity for the Embassy to create the first Norwegian '**Green Embassy'** and to use the Embassy actively to show case environmental and carbon friendly solutions and technologies. A carbon neutral embassy is possible to achieve. A host of available techniques and solutions are available.

Final Observations. Finally, the Team offers some observations primarily related to follow-up:

- The Embassy should more clearly document the environmental and climate change related issues, including reductions in GHG emissions, in projects and programs supported by the Embassy and encourage their partners to do the same. There is also a need to clearly document to what extent environmental assessments have been undertaken (EIA) and how these are followed up;
- The Embassy needs strengthening of its human resources. With the current staffing level it will be extremely challenging to translate the high ambitions into action; and
- The Embassy should carefully review the recommendations provided in this report and prepare a follow-up plan as part of the annual business planning.

1. MAINSTREAMING OF ENVIRONMENT AND CLIMATE PROOFING – APPROACH AND METHODOLOGY

1.1 Introduction

The Norwegian Action Plan for Environment in Development Cooperation was presented in June 2006. The Government's aim is for Norway to play a leading role in making environmental concerns an integral part of all development cooperation. The ultimate goal of Norway's efforts is for developing countries to acquire the capacity and competence necessary to safeguard their right to a clean environment and the ability to manage their natural resources in a sustainable manner. The action plan sets the direction for Norway's efforts for the next ten years.

All Norwegian Embassies are requested to increase their efforts on addressing climate change. Reporting on national developments will be an important task, as well as assessing continuously how Norway can assist in achieving set climate change targets and objectives. The role each partner country can play in climate change negotiations and providing support to activities that can move partner countries towards accepting long-term commitments will be of key importance.

The Ministry of Foreign Affairs (MFA) has instructed all Embassies to increase efforts to ensure mainstreaming of environment, climate change and gender and measures to combat corruption. Increased reporting on these issues is expected. Furthermore, impacts of climate change and 'climate proofing' should constitute an element of the overall policy dialogue with partner countries, including in the dialogue with multilateral organizations and non-governmental organizations (NGOs).

1.2 Environmental Mainstreaming in the Context of the Embassy's Portfolio

Addressing/integrating environment implies 'mainstreaming' of environment in the Embassy's portfolio. **Environmental mainstreaming** refers to the integration of environmental policy considerations into core institutional thinking. Mainstreaming can help align policies, programs and operations with the long-term requirements of sustainable development, help modernize development policy content and procedures, and promote a pro-active approach rather than responding to impacts as they unfold. Mainstreaming covers both assessing scope for benefiting from environmental opportunities and avoiding negative impacts on the environment.

For the Embassy the integration of environment during programming serves two objectives:

1. To identify and avoid harmful direct and indirect environmental impacts of cooperation programs in the different sectors which can undermine sustainability and counteract achieving the development co-operation objectives of the program – "**do no harm**"; and
2. To recognize and realize opportunities for enhancing environmental conditions, thereby bringing additional benefits to development and economic activities and advancing environmental issues – "**do good**".

Combined this will contribute to a "**greening**" of the Embassy's portfolio.

In the Norwegian-supported development efforts the Embassy should actively promote "**do good**", in addition to "**do no harm**". This will be an effective contribution to Norway's com-

mitment to ensure that people and the environment are not harmed as a result of its financing, reduces and manages risk - saves money and time, improves performance and ultimately reduces risks to the Embassy's reputation.

1.3 Climate Proofing

To address climate change, the design criteria must be based on probable future climate scenarios and expected impacts. Screening for climate risks represents a first step towards "**climate-proofing**" of development programs. The screening will help to identify not only programs at risk of climate change but also those that are not climate sensitive and do not, therefore, require further risk analysis.

The following questions will be considered as a starting point:

- How does current climate variability affect the program area? What are the impacts of this variability (floods, droughts)? What are the existing coping strategies used to deal with these impacts?
- What is the country's vulnerability and risks from climate change and extreme weather?
- What are the anticipated impacts of climate change in the program area?

Based on the questions above development programs will be classified into three categories:

- **Category 1 - High risk** – Full climate risk assessment required
    - Sensitive sectors: agriculture, water resources, energy, coastal development and management and other infrastructure (e.g. roads).
    - Development programs in high risk areas, e.g. coastal, river bank, dry land areas.
- **Category 2 – Partial or moderate risk** – Selective climate risk assessment required:
    - Development programs with strong components related to water and in risk areas (e.g. integrated rural development, agriculture, fisheries, water supply and sanitation).
- **Category 3 - Low/no risk** – No assessment required.
    - Includes development programs that are not affected in any significant way by climate, and not affecting external vulnerabilities, e.g. within health, education.
    - It should, however, be noted that these sector can be affected by indirect impacts of climate change (socio-economic change, migration, reduced food production, vector-borne diseases etc.) and can be used to enhance capacity and raise awareness on climate change.

The approach to the Review is clearly set out in the terms of reference (TOR), see Annex I.

1.4 Policy Context – India

Climate Change and India

India's emissions of greenhouse gasses (GHGs) per capita are well below the world's average, about 1 million tones CO_2 per capita.

Climate change may alter the distribution and quality of India's natural resources and adversely affect the livelihood of its people. With an economy closely tied to its natural resource base and climate sensitive sectors such as agriculture, water and forestry, India may face a major threat because of the projected changes in climate.

Studies indicate that the following changes can be expected[1]:

- Surface temperatures in India show a warming of about 0.3°C between 1901 and 2000 with considerable regional variation;
- The All-India rainfall series for the monsoon season shows no clear trend between 1901 and 2000. Regional differences exist with some areas experiencing moderate increases and other decrease in rainfall;
- A long term rising trend of about 0.1 mm per year in sea level has been observed and the rise is greater along the east coast than along the west coast;
- Climate change scenarios (future changes in temperature and rainfall) indicate the following results:
    - Warming occurs in all four seasons;
    - 2–3 °C rise by 2100 (with A2 greenhouse gas emission scenario);
    - Warming is highest for post-monsoon (October–November) and winter seasons (December– January–February) over northern India;
    - Most climate models indicate wetter monsoon conditions. These are likely to be associated with higher rainfall intensities causing higher peak flows in rivers and increases in flood magnitude/frequency;
    - Increased frequency of floods;
    - There are no clear indications at this time regarding future changes in El Niño amplitude in a warmer climate and its influence on monsoon rainfall;
    - It is likely that future tropical cyclones will become more intense, with greater peak wind speeds and heavier precipitation;
    - There is medium confidence in future rainfall scenarios and changes in the frequency of extreme events because climate models still show considerable differences in their ability to simulate these phenomena and how they will behave in a warmer climate;
    - Southern peninsular coast will be most vulnerable to sea level rise; and
    - Frequency of hot days and multiple-day heat waves has increased,.

India's Response to Climate Change Risks

India signed the United Nations Framework Convention on Climate Change (UNFCCC) on 10 June 1992 and ratified it on 1 November 1993. Under the UNFCCC, developing countries such as India do not have binding GHG mitigation commitments in recognition of their small contribution to the greenhouse problem as well as low financial and technical capacities. The Ministry of Environment and Forests is the nodal agency for climate change issues in India. India acceded to the Kyoto Protocol on 26 August 2002.

India has a well-developed policy, legislative, regulatory and programmatic regime for promoting energy efficiency, renewable energy, nuclear power, fuel switching, energy pricing reforms and addressing GHGs emissions in the energy sector. As a consequence India's energy intensity of the economy has come down significantly.

On June 30, 2008, Prime Minister Manmohan Singh released India's first National Action Plan on Climate Change (NAPCC)[2] outlining existing and future policies and programs addressing climate mitigation and adaptation. The plan identifies eight core "national missions" running through 2017 and directs ministries to submit detailed implementation plans to the Prime Minister's Council on Climate Change by December 2008.

[1] Institute of Development Studies, 2007. ORCHID: Climate Risk Screening in DFID India. Technical Appendix.

[2] Government of India, Prime Minister's Council on Climate Change. 2008. National Action Plan on Climate Change.

Emphasizing the overriding priority of maintaining high economic growth rates to raise living standards, the plan "identifies measures that promote our development objectives while also yielding co-benefits for addressing climate change effectively." It says these national measures would be more successful with assistance from developed countries, and pledges that India's per capita GHGs "will at no point exceed that of developed countries even as we pursue our development objectives."

The following eight National Missions are included:

- **National Solar Mission**: The NAPCC aims to promote the development and use of solar energy for power generation and other uses with the ultimate objective of making solar competitive with fossil-based energy options. The plan includes:
    - Specific goals for increasing use of solar thermal technologies in urban areas, industry, and commercial establishments;
    - A goal of increasing production of photovoltaics to 1000 MW/year; and
    - A goal of deploying at least 1000 MW of solar thermal power generation.

  Other objectives include the establishment of a solar research center, increased international collaboration on technology development, strengthening of domestic manufacturing capacity, and increased government funding and international support.
- **National Mission for Enhanced Energy Efficiency**: Current initiatives are expected to yield savings of 10,000 MW by 2012. Building on the Energy Conservation Act 2001, the plan recommends:
    - Mandating specific energy consumption decreases in large energy-consuming industries, with a system for companies to trade energy-savings certificates;
    - Energy incentives, including reduced taxes on energy-efficient appliances; and
    - Financing for public-private partnerships to reduce energy consumption through demand-side management programs in the municipal, buildings and agricultural sectors.
- **National Mission on Sustainable Habitat:** To promote energy efficiency as a core component of urban planning, the plan calls for:
    - Extending the existing Energy Conservation Building Code;
    - A greater emphasis on urban waste management and recycling, including power production from waste;
    - Strengthening the enforcement of automotive fuel economy standards and using pricing measures to encourage the purchase of efficient vehicles; and
    - Incentives for the use of public transportation.
- **National Water Mission**: With water scarcity projected to worsen as a result of climate change, the plan sets a goal of a 20% improvement in water use efficiency through pricing and other measures.
- **National Mission for Sustaining the Himalayan Ecosystem**: The plan aims to conserve biodiversity, forest cover, and other ecological values in the Himalayan region, where glaciers that are a major source of India's water supply are projected to recede as a result of global warming.
- **National Mission for a "Green India":** Goals include the afforestation of 6 million hectares of degraded forest lands and expanding forest cover from 23% to 33% of India's territory.
- **National Mission for Sustainable Agriculture**: The plan aims to support climate adaptation in agriculture through the development of climate-resilient crops, expansion of weather insurance mechanisms, and agricultural practices.
- **National Mission on Strategic Knowledge for Climate Change:** To gain a better understanding of climate science, impacts and challenges, the plan envisions a new Climate Science Research Fund, improved climate modeling, and increased interna-

tional collaboration. It also encourages private sector initiatives to develop adaptation and mitigation technologies through venture capital funds.

India has established a National Clean Development Mechanism (CDM) Authority. As of 31 January 2009 there are 392 registered CDM projects in India, while host country approval has been given to about 1,000 projects. Renewable energy, including renewable biomass, accounted for the largest number of projects, followed by energy efficiency. India accounts for about 32% of the total registered CDM projects.

2. ASSESSMENT OF THE EMBASSY'S PORTFOLIO

2.1 Introduction

The Embassy identified the following programs and projects to be reviewed, presented in the Table below:

PTA number and name	Agreement Partner
IND 3053 – Norway-India Partnership Initiative (NIPI)	Government of India
IND 3025 – 08/049 TERI – Frame Funding for Institutional Co-operation Confronting Climate Change	The Energy and Resources Institute (TERI)
IND 3025 – 08/046 Bioforsk – IITK Solar Energy for H2-Production Combined with CO2-Capture	Bioforsk
IND 3025 – 08/047 – Climate Change Impacts on River Basins	Bioforsk
IND 3025 – 06/079 Climate Change and Persistent Droughts - Impact, Vulnerability and Adaptation in Rice Growing Sub Divisions of India	Bioforsk
IND 3025 – 06/058 Institutional Support and Human Resource Development in Applied Research for Assessment, Prevention, Mitigation and Early Warnings og Tsunamis and Landslides in India	International Centre for Geohazards
BTN 2564 – BTN 07/002 Support to the Accelerated Hydropower Development Program of Bhutan	Gross National Happiness Commission
IND 3062 – 08/014 – Music Collaboration India – Norway for the Period 2008 - 2012	Concerts Norway
IND 3055 – 06/059 Match Making Program India	Innovation Norway

In the following, the main findings of the review of the various projects and programs are presented. For each program a short description of goals and activities are presented for information, existing climate change and environment-related activities included in the project are presented, assessment of climate change and environmental issues is undertaken and finally specific recommendations to the Embassy are provided.

It should be noted that the Review Team offers a menu of possible actions that the Embassy should consider strengthening the climate change and environmental component of the supported projects and programs. The Embassy needs to carefully review the suggestions and itself decide on the appropriate course of action. Some of the recommendations can be easily addressed without significant resource implications. Other recommendations will have resource implications for the Embassy and need to be carefully assessed in the Embassy's follow-up plan to the Review.

2.2 Support to Climate Change and Clean Energy

General Observations and Comments on the Embassy's Strategy

The Embassy has been mandated to promote cooperation with India on environment, energy and climate change at the government level, between institutions, and business-to-business. The overall goal of these efforts can be said to be dual: to have real impact in supporting low carbon solutions for economic development in India/assist India meeting the challenge of climate change, and at the same time contribute to reaching Norwegian national targets.

This is an ambitious mandate and a major challenge. In order to serve this mandate effectively, the Embassy has developed a draft strategy and an action plan. The Embassy's strategy is anchored in relevant Norwegian policies on climate change and energy, and will be an input to the 2009 Norwegian Strategy for India.

In June 2008, India launched its NAPCC. Although India has not yet defined if and to what extent international support in implementing the NAPCC is desired, the initiatives taken from the Indian side towards Norway clearly fall within the priorities of the Action Plan. The Embassy strategy takes as a basic premise that priority should be given to cooperation in support of NAPCC and specifically respond to Indian initiatives vis-à-vis Norway in that regard.

Also, Norway is committed to promoting cooperation in areas where India may be more hesitant or in areas that do not immediately fall within NAPCC, such as carbon capture and storage (CCS) and green ships. The strategy is therefore proposed to have two tracks: a dominant one based on Indian priorities (but where Norwegian national targets are included) and a secondary one based on "unilateral" Norwegian climate change priorities. The assumption is that one is more likely to succeed in the second track if the first track is considered successful by the Indian side.

In the following some comments and suggestions for moving forward are provided:

- **Small donor**. Norway is a small donor, and need to use our resources in a smart and targeted manner in order to influence the climate change agenda in India and achieve the intended results. Therefore the strategy should focus on key areas/niches where Norway can make important contributions, rather than be an all encompassing strategy.
- **Invest in low-carbon technology**. Increased investments in low-carbon technology, improved energy efficiency and increased use of renewable energy are of key importance in addressing the climate and energy access nexus. Energy is essential for both social and economic development. Providing better access to reliable energy services at prices that are affordable to poor people is crucial to achieving development outcomes. Simple, decentralized solutions will play an important role. The solar initiative supports these objectives.
- **Include cross-cutting issues**. The support to climate change activities should also more proactively take into account key cross-cutting dimensions that are important to Norway politically – environment (climate change mitigation projects and low carbon technology can have unanticipated environmental and social impacts that should be considered), gender, good governance, anti-corruption and promotion of private sector.
- **Norwegian clean energy platform and action plan**. The Norwegian clean energy platform and the clean energy action plan[3] will also be useful input to the preparation of the final strategy. In the area of energy the planned support could take account of the priority given in the Norwegian environmental action plan to:
    i. providing assistance for energy resource mapping, analyses of energy use, development of regulatory frameworks and system design with respect to the most promising renewable sources of energy;
    ii. supporting development and use of renewable energy, including biomass, wind and solar energy; reflecting recent technological developments;
    iii. supporting development of small power plants in conjunction with solutions that address water supplies, flood mitigation and agricultural irrigation;
    iv. supporting measures designed to improve energy efficiency; and
    v. supporting measures to reduce the negative health effects resulting from the use of biomass for household energy purposes.
- **Develop clear goals and objectives**. The draft strategy document should be reworked to more clearly spell out the planned goals and objectives. Norway is not a bilateral donor to India and has not been officially requested to provide support, however, a long-

[3] Can be downloaded from: http://www.regjeringen.no/nb/dep/ud/dok/rapporter_planer/Planer/2007/ren_energi_utviklingsarbeidet.html?id=489316

term, overall goal could be to assist India in its planned directional shift in the development pathway to a low-carbon path, and through institutional cooperation and private sector development to increase the understanding of climate change, adaptation and mitigation, energy efficiency and natural resource conservation, thereby supporting the implementation of the Norwegian climate change policy. More specifically three objectives could be spelled out:

i. Support to selected priority areas guided by the NAPCC;
ii. Support initiatives based on Norwegian Climate change priorities, e.g. CCS and green ships; and
iii. Engage in an active political dialogue on climate change with a view to developing mutual understanding on key areas.

- **Implementation approach.** The strategy could be implemented through the active use of the JWG-modality, MoU on climate change and CDM, development of framework programs with TERI and other institutions, as appropriate, institutional cooperation, inter-ministerial dialogues, seminars/conferences, and support to private sector initiatives.
- **Scoping study**. It is proposed that the Embassy considers undertaking a scoping study to identify and tease out more specific areas/niches for climate change cooperation guided by the NAPCC and Norwegian "unilateral" priorities. This could be used to initiate a process between institutions and companies in India and Norway to develop specific cooperation proposals, possibly also modeled after the Match-Making Program. There seems to be a need to identify key areas and niches where Norway can contribute under the broad headings of climate change, energy and environment. The current portfolio lacks a clear focus, and in order to achieve the intended results of the cooperation a more targeted and focused approach should be taken. Norad, if requested, is ready to assist the Embassy in these efforts and the Norwegian Ministry of the Environment (MoE) is also expected to play a key role in such efforts.
- **Key NAPCC Missions Norway could support**. Based on a cursory review of the NAPCC the following missions could be used as a departing point for the identification of potential areas for cooperation:
  i. National solar mission;
  ii. National mission for enhanced energy efficiency;
  iii. National mission for sustaining the Himalayan ecosystem (the "third pole"); and
  iv. National mission on strategic knowledge for climate change.
- **Reducing Emissions from Deforestation and Forest Degradation (REDD)**. Of key interest to Norway is the issue of REDD. The NAPCC has a National Mission for a "Green India". The Embassy should carefully consider the feasibility of engaging into REDD-related cooperation with India, primarily through multilateral channels and research and development (R&D) cooperation. However, as India is planning to undertake large scale afforestation, REDD might be of lesser interest.
- **Stronger focus on adaptation.** The issue of adaptation to climate change is not clearly spelled out in India's NAPCC except for adaptation within agriculture. The Embassy already has adaptation-relevant projects in the portfolio, however, a more strategic focus on adaptation could be elaborated. The Embassy should consider how adaptation activities beyond the agricultural sector also could be supported.
- **Focus on existing climate variability and natural disasters.** India's economy is overall reliant on climate factors (e.g. due to agriculture) and variability in climate (rainfall, monsoons, seasons) has a great impact on the economy and livelihoods. Without being able to cope with the existing climate variability India will not be able to deal with the additional variability caused by climate change. Furthermore, natural disasters also put additional strains on the economy and livelihoods. The frequency of natural disasters is expected to increase and India needs to focus their efforts to reduce the impacts of these. The Embassy could in its dialogue with project partners focus on the key importance of designing projects to reduce vulnerability to climate variability and natural disasters and means to increase communities resilience.

- **Clean Development Mechanism (CDM).** The CDM market has taken a significant downturn the last months due to the financial crisis affecting the world. Several CDM-eligible projects in India have stopped due to low prices in the compliance market and difficulties in getting the necessary financing. The Embassy is involved in CDM-related work through two different channels: Engagement of Innovation Norway by the Norwegian Ministry of Finance to identify suitable projects for CER procurement, and agreement between Innovation Norway and Norad on assessment of projects requesting support from Norad's CDM project development support scheme. This engagement could be used to actively promote projects that have real, positive effects on environment and other sustainable development elements. In addition, closer links between the private sector support activities, including Innovation Norway's CDM activities, and the projects in the Embassy's portfolio – as suggested later in this report – could facilitate identification of CDM opportunities in relation to these projects.
- **Maintain and expand political dialogue**. The political dialogue with India as one the BRICs should be a key factor in the cooperation. India plays a key role in climate change negotiations. Norway needs to increase our understanding of India's various positions, and at the same present Norwegian priorities to ensure that we are working towards common goals. The Embassy has developed a rather active dialogue with relevant partners through project based support and involvement of policy makers in the process, through bilateral meetings and discussions and through exchange visits. The Joint Working Groups also offer an excellent platform for political dialogue
- **Result based management**. A results approach involves shifting management attention away from a focus on inputs, activities and processes to a focus on benefits – from 'what you have done' to 'what you have achieved'. Results management focuses on using information on results to improve decision making. Norad has developed a handbook which can guide the partners' efforts in adopting a more result-based framework for cooperation activities[4] and relevant training should be undertaken.
- **Staffing – key constraint.** The Embassy has staff constraints that could hamper the implementation of the strategy, which needs to be acknowledged. Currently, the Embassy has highly qualified staff members whom have developed a broad climate change relevant portfolio. In order to deliver effectively on the high ambitions of the Norwegian government the Embassy will need additional staff. The Embassy in Beijing, for example, has a dedicated climate change/environment counselor, and a similar arrangement in New Delhi could alleviate the staffing situation and strengthen the dialogue with India. Developments in India will be key to the world's climate and should be prioritized.

2.2.1 IND 3025 – 08/049 TERI – Frame Funding for Institutional Cooperation Confronting Climate Change

Goals and Activities

The goal of the Framework Program is to address global concerns of energy security and climate change through cooperation between TERI, Norwegian and other third party institutions on climate change, CDM, renewable energy and energy policy. The specific program objectives are:

- To promote research, dialogue and catalyze action on key energy and climate change issues to facilitate and accelerate responses. This would be in terms of three thematic: clean energy options, climate change, and energy security and climate change interfaces. More specifically the project will work on:
    - Research and assess climate change impacts and responses;
    - Research energy access and availability concerns, both globally and nationally;

[4] Norad, 2008. Result-based management in development cooperation: Practical guide.

- Develop and facilitate transitions to clean energy and put in place actions to implement the NAPCC; and
- Assess potential for and mechanisms to incentives for energy efficiency.

The project seeks to achieve these objectives through a key set of activities aimed at:

- Bridging knowledge gaps on climate change impacts and the potential of various climate change mitigation options rooted in the energy sector;
- Designing of policy instruments to foster adoption of cleaner and more efficient energy options;
- Strengthening institutions and energy governance mechanisms for more efficient and effective energy sector organizations, integrated working of various ministries/departments, involvement of marginalized groups in decision-making and enhancing the knowledge of legislative provisions that can help or hinder transitions towards sustainable energy; and
- Increased co-operation among and engagement of research institutions, business, civil society and the policy community.

TERI has identified 14 program activities (later changed to 13, as the CCS component has been postponed):

1. Assessing and scaling up of Solar Multi-utility for livelihood generation in 3 selected regions in India;
2. Promoting Clean lighting and improving quality of life in Rural India: Developing local capacities for Lighting a Billion Lives Campaign;
3. Carbon capture and sequestration (CCS) in India;
4. Efficient Clean Energy Technologies in India;
5. Impact Assessment of Climate Change, including climate change process and earth modeling;
6. Impacts of climate change on the Himalayan Glaciers;
7. Developing Country Participation in addressing Climate Change: Analyzing issues and options for India;
8. Estimating the Costs of Mitigation and Adapting to Climate Change;
9. Business Sector's Engagement in Indian Market in Promotion of Low Carbon Economy: TERI BCSD Centre for Business and Sustainable Development;
10. Incentivizing energy transitions towards low carbon pathways in India;
11. Towards global energy security: Managing energy risks and vulnerabilities in hotspots;
12. Developing Asia Contribution on Issues of Technology for Copenhagen;
13. Promoting South –South Co-operation; and
14. Delhi Sustainable Development Summit- 2009.

Climate Change and Environmental Issues Addressed in the Program/Project

The TERI program is in practice the primary vehicle for the Embassy to deliver on its strategy for Indo-Norwegian collaboration on Energy, Climate Change and Environment. All activities included in the program are climate change and environment related. If successfully implemented this will be an important input to the implementation of the NAPCC. TERI has developed a detailed work plan, which was approved at the first annual meeting of the program. In the plan, TERI identifies main environmental concerns addressed for most of the activities. TERI is in the process of establishing cooperation with relevant institutions in Norway.

Assessment of Climate Change and Environmental Issues

Climate change mitigation activities and low carbon technology might have environmental and social impacts that should be addressed as part of the R&D cooperation. This could apply to the planned activities within efficient clean energy technologies (component 4), CCS (component 3), costs of mitigation and adaptation (component 8), energy transformation (component 10) and global energy security (component 11). It would be beneficial if the TERI program or other R&D activities will be addressing the social implication of climate change, e.g. impacts on women and other vulnerable groups, conflicts, migration, income distribution, etc.

The program does not include activities focusing on adaptation nor forests (REDD). The Embassy should be open to consider later proposals for including activities with this focus in the program as also TERI is interested in working on these issues.

Norway is supporting other activities in the Himalayan region which could be of relevance to the Program. Two examples are the support provided to ICIMOD in Kathmandu, Nepal, provided by the Norwegian Embassy in Kathmandu and the MFA's support to the feasibility study on "Himalayan Climate Impact and Adaption Assessment" (HICIAA) undertaken by CICERO and Grid-Arendal.

TERI lacks knowledge and information on relevant Norwegian institutions. TERI should be given support to assess the scientific merits of potential partners in Norway as a basis for developing joint proposals based on the identified cooperation areas in the agreement, and entering into cooperation arrangements. The Embassy should assist TERI in this process to ensure that TERI select partners that can provide the highest value added possible.

The private sector is specifically addressed in one of 13 activities. It might however be relevant to consider involving the private sector in other activities as well. Where Norwegian private sector may be relevant, Innovation Norway (IN) could be a natural partner in this.

Climate Risk Assessment: 3 – Low

Conclusions and Recommendations

The follow up of the project and the dialogue with the implementation partners could address the following issues in order to ensure the long term sustainability of the project:

- *The support to TERI is considered highly relevant and will help to develop the capacity in India to address climate change.*
- *Using Mid-Term Review (MTR) proactively to consider the strategic direction of the cooperation. Furthermore, to ensure the necessary flexibility to pick up new and emerging climate change priorities (in essence to avoid being locked in), it is important that TERI does not program all funds initially;*
- *Requesting TERI and partners to assess potential environmental and social impacts of climate change mitigation activities and low carbon technology as part of the R&D cooperation;*
- *Considering possible later proposals for including activities with focus on* adaptation *or forestry/*REDD *in the program;*
- *Assisting TERI in identifying and selecting Norwegian partners and entering into contracts. Norad and the Norwegian MoE could jointly prepare such a list for TERI's consideration. TERI should be encouraged to establish a transparent procedure to assess the value added provided by Norwegian institutions as part of this process;*
- *Coordination and sharing of information related to the activities on Himalaya with other Norwegian-supported activities, e.g. ICIMOD and HICIAA, should be encouraged;*

- *Ensuring dissemination of results towards the policy level, but also towards technology relevant private sector and the public;*
- *Encouraging TERI to involve the private sector in activities where it can be relevant;*
- *Classifying the program as climate change relevant using the climate change policy marker in PTA.*

2.2.2 IND 3025 – 08/046 Bioforsk – IITK Solar Energy for H_2-Production Combined with CO_2-Capture

Goals and Activities

The overall goal of the proposed project is to contribute to the development of new, internationally competitive and environmentally friendly energy systems, leading to reduced CO_2 emission in accordance with the next generation climate agreements, and to create a basis for a future-oriented social development. The primary aim for the project is to explore and develop innovative technologies for converting solar energy directly to hydrogen gas using photosynthesis in algae, combined with capture of CO_2 from flue gas and subsequent use of the remaining algal biomass to produce health food and aquaculture/ animal feed, which will create additional value to the process.

Main activities under the proposed project include:

1. Constructing and running operational photo bioreactor(s) in India aiming at demonstrating the full potential of the outlined concept;
2. Addressing the question of quantities of CO_2 to be sequestered from power plants or other local industrial activities and outline the biological systems needed to recycle CO_2 produced (Andhra Pradesh/Karnataka states);
3. Using selected micro algal species in the photo bioreactors to determine the capacity of photo biological CO_2 fixation/sequestration. Perform real experiments in the developed photo bioreactors mimicking larger full-scale systems;
4. Setting up photo biological H_2 production units using both green algae and cyanobacteria to determine capacities and limitations;
5. Exploring possibilities for process optimization of hydrogen production from green algae and cyanobacteria at genomic and proteomic levels;
6. Exploring experimentally the content and possible uses of the obtained algal biomass for (a) health food and animal feed, and (b) health promoting biomolecules; and
7. Explore feasibility and financial viability of the proposed technology at local level, and develop strategies for implementing similar bioenergy projects in other areas of India, which includes stakeholder participation.

The project is implemented by Bioforsk – the Norwegian Institute for Agricultural and Environmental Research in Norway – and IIT – Indian Institute of Technology.

Climate Change and Environmental Issues Addressed in the Program/Project

The project aims to explore how hydrogen, one of the potential future energy alternatives to the limited fossil fuel resources of today, can be produced in India. Use of hydrogen as a source of energy is advantageous from a number of points: it is eco-friendly, efficient, renewable, and during its production and utilization no CO_2 and at most only small amounts of NO_x are generated.

Assessment of Climate Change and Environmental Issues

The use of hydrogen gas is an attractive alternate energy source. Biological hydrogen production has several advantages over other conventional hydrogen production processes. It

requires the use of a simple photo bioreactor akin to a transparent closed box, has low energy requirements, does not generate CO_2 as a by-product, and is very cost effective.

Cyanobacteria are highly promising micro organisms for hydrogen production. In comparison to the traditional ways of hydrogen production (chemical, photoelectrical), Cyanobacterial hydrogen production is commercially viable; however, much future improvement and progress remains before hydrogen is accepted as a commercial primary energy source. The main challenge associated with this project does not seem to be the technology but the capacity in India to run such processes, the commercial use of the algal biomass and the feasibility of using this technology at a local level.

Calculating the GHGs emission reduction potential of the process compared with the necessary investment and production cost of energy could at some point be considered. This will help the Embassy in quantifying their contributions to combat climate change.

Environment as a sustainability element is not mentioned in the AD. Other risks such as occupational safety (hydrogen is explosive) may also be relevant, but are not mentioned in the AD.

As mentioned above, much research remains before H_2 can become a new primary energy source, and it the impact from a relatively small Norwegian project in this respect can only be marginal. It should be made sure that the Norwegian ODA funds, in spite of their relatively modest size, add real value, have a catalytic effect, or fill in gaps. This project may not be the most strategic way limited funds could be used and the development impact is marginal.

The dialogue with the project partners should emphasize the importance of preparing the ground for sustainable use of the results of the project. Closely following the progress of development of the value chain of H_2 (including infrastructure for distribution, facilities for use, etc.) will be relevant for the project partners. On the policy level, it should be considered what impact the project can have on the policy level, to prepare the Indian capacity to use the process in question. Sustainability will also depend on the scalability and financial viability of the process and the commercial viability of the whole concept. Cooperation between industry and research community can ensure that research projects keep a realistic focus and could provide an early ‘reality check’ of the solutions and concepts. This is mentioned in the AD when it comes to: i.) the availability of CO_2 (dialogue with power generators); and ii.) commerciability of the by-product. However, the attractiveness and viability of H_2 as an energy source may also need a similar ‘reality check’. Using the Private Sector Development (PSD) strategy as a platform could also be effective for introducing potentially interested Norwegian companies or investors to opportunities in India.

Climate Risk Assessment: 3 – Low

Conclusions and Recommendations

The follow up of the project and the dialogue with the implementation partners could address the following issues in order to ensure the long term sustainability of the project:

- *Ensure that the project is implemented in a way that facilitates the use of the results and that these are built on in further efforts in India;*
- *Address the issue of the long-term feasibility of establishing a value chain for the use of H_2 as a source of energy in India and how this project can contribute to this;*
- *Assess how the insight and experience from the project can be used strategically to influence policy making;*
- *Assess possibilities for involving the private sector at an early stage in order to get a reality check of the viability of the process, and the commercial potential of the by-product;*

- *Assess the mitigation potential of the technology compared to cost of production;*
- *Assess occupational and safety risks associated with the project; and*
- *The project should be classified as climate change relevant – climate change policy marker in PTA.*

2.2.3 IND 3025 – 08/047 – Climate Change Impacts on River Basins

Goals and Activities

The main goal of the proposed institutional co-operation project is to prepare the base line scenario and develop adaptation methods/tools that will help address the climate change impacts on hydrological regimes in a selected river basin. The tools thus developed can also be applied to other semi-arid areas in India.

The main project objectives include:

1. To identify likely impacts of climate change on water resources, e.g., hydrological flow extremes at watershed level, and changes in water quality and effects on biodiversity, based on possible scenarios for semi-arid regions;
2. To study the socio-economic vulnerability assessment in selected basin, society's preparedness, and the formal institutional and policy strategies that help to improve the adaptive capacity;
3. To assess the ongoing measures/interventions being implemented for addressing the hydrological extremes. Based on the current status, develop a range of possible integrated mitigation and adaptation measures (planned and autonomous) on the ground that could reduce potential future vulnerability; and
4. To develop methodologies to integrate short to medium term climate change forecasts into Integrated Watershed Management systems by use of GIS and other tools/models, and aim at transferring the methodologies to other watersheds.

These methods will be tested in selected watershed(s) in a pilot drainage of Godavari river basin in Andhra Pradesh. The project will be implemented by Bioforsk and the Indian Institute of Technology (IIT Delhi).

Climate Change and Environmental Issues Addressed in the Program/Project

The project is primarily a research project aimed at increasing the capacity in India to assess the impacts of climate change and approaches to adaptation. The project is considered relevant from an environmental and climate change point of view.

Through the project a comprehensive database will be set up and various modeling and scenario analysis will be undertaken.

Assessment of Climate Change and Environmental Issues

Current water management practices may not be robust enough to cope with the impacts of climate change on water supply reliability, flood risk, health, agriculture, energy and aquatic ecosystems. In many locations, water management cannot satisfactorily cope even with current climate variability, so that large flood and drought damages occur. As a first step, improved incorporation of information about *current* climate variability into water-related management would assist adaptation to longer-term climate change impacts. Therefore, it could be argued that by focusing on adapting to existing climate variability, the project's policy relevance will be enhanced. Existing climate variability and the challenges and opportunities in the river basin to adapt to these should preferably be the point of departure for the study.

A comprehensive database on the water sector will be set up. This will require clarification of who will establish the database and who will be responsible for operation and maintenance of the database. Based on the reviewed information, sustainability of this component could be questioned.

The selection of the Godavari River as study site could be questioned since this river basin is only projected to experience water shortages in a few locations according to India's National Communication to the UNFCCC (2004)[5]. Furthermore, there are inter-state water conflicts in the river basin. A conflict risk assessment of the project should be considered.

The direct policy relevance of the project should be strengthened by more proactively involving authorities at various levels in the project.

Climate Risk Assessment: 3 – Low

Conclusions and Recommendations

The follow up of the project and the dialogue with the implementation partners could address the following issues in order to ensure the long term sustainability of the project:

- *The support to the project is considered relevant and could have development impacts, however the partners should be encouraged to enhance the policy relevance of the project through focusing on the existing climate variability in the river basin;*
- *The Godavari River basin is not likely to be the most affected by climate change, reinforcing the need to consider adaptation to the* existing *climate variability and natural disasters;*
- *A conflict risk assessment of the project should be undertaken and the Embassy should carefully follow the implementation of the project;*
- *The partners should be requested to assess the sustainability of the proposed database; and*
- *The project should be classified as climate change relevant – climate change policy marker in PTA.*

2.2.4 IND 3025 – 06/079 Climate Change and Persistent Droughts - Impact, Vulnerability and Adaptation in Rice Growing Sub Divisions of India

Goals and Activities

The goal of the project is identification and demonstration of integrated adaptation strategies to sustain rice productivity in defined rice growing sub division of different climate change scenarios in India. To this end the project will study the impact of climate change on water availability and rice production and thereby enhance the knowledge and capacities to integrate climate change scenarios into agricultural policies.

The proposed cooperation will contribute towards the generation of standard procedures to address climate change related issues with specific reference to rice production. These procedures will be useful to other regions, to formulate measures to address the vulnerabilities within the changing climate, thus the project will have focus on transferability of procedures. The main planned outcomes are:

- Increased awareness of climate change impacts on agriculture;
- Enhanced capacity to integrate climate change considerations into agricultural development policies;

[5] Government of India, 2004, National Communication to the United Nations Framework Convention on Climate Change.

- Integrated adaptation strategies identified to sustain rice productivity under changing climatic conditions; and
- Transferable frameworks and techniques for other rice growing sub-divisions in India offered.

The contract partner is Bioforsk and the project is implemented in cooperation with Tamil Nadu Agricultural University, Indian Meteorological Department (IMD), Department of Science and Technology (DST) and the International Pacific Research Centre (IPRC), University of Hawaii.

Climate Change and Environmental Issues Addressed in the Program/Project

This is primarily a research project aimed at both weather and crop modeling to predict future monsoons' impact on future rice production and to assess various agro techniques as adaptation measures. Estimation of future food demand and supply would be an important task to assess the impact of climate change. Based on the resource input and availability of data there is a considerable risk that the project will not be able to provide detailed policy-relevant information on these issues.

The project is considered relevant from an environmental and climate change point of view.

Assessment of Climate Change Issues

The impacts of climate change on agriculture and agriculture's contribution to emissions of GHGs in India are uncertain. Depending on increase in CO_2 and higher temperature, the average impact could be positive and negative. According to IDS's report the rabi crops (winter season crop) in central and southern India will be more uncertain in the future. It should also be noted that the existing state of the art global circulation models (GCMs) are yet to be fine-tuned to resolve the complexities of the Indian summer monsoon before their respective usages for the climate change projections based on the IPCC scenarios. Through the cooperation with TERI, work will be undertaken to improve the modeling capacity in India. Based on the obvious weaknesses in GCMs and lack of ability to include specific and better representations of the regional processes in the climate models, there is a risk that this project will not be able to adequately model water availability and rice crop production as a basis for policy interventions. A stronger focus on adapting to existing climate vulnerability would reduce this risk. Rice production is a major water consumer and is severely affected by current water availability; therefore there is an urgent need to assess how resilience of rice farmers can be strengthened through improved agro techniques.

Furthermore various agro techniques might cause changes in emissions of GHGs from agriculture. Rice growing areas emit large quantities of methane, a potent GHG. For each agro technique studied the potential mitigation effect should be considered.

Climate Risk Assessment: 2 – Moderate (applies to the sector, not the project itself which carries low risk – e.g. 3)

Assessment of Environmental Issues

The project aims to develop and assess various integrated agro techniques to minimize negative impacts of droughts. The potential environmental and social implications of these techniques should be addressed.

Without explicitly stating it, the project addresses issues related to SRI (System of Rice Intensification). SRI is a combination of several practices that includes changes in nursery management, time of transplanting, water and weed management that reduces the water

consumption in rice production significantly. SRI requires the root zone to be kept moist, not submerged. Water applications can be intermittent, leaving plant roots with sufficiency, rather than surfeit of water. The SRI method, is gaining popularity among paddy farmers in several states in the country primarily for its potential to improve productivity of land, capital, water and labor simultaneously. The project should consider assessing the applicability of SRI. The MFA is supporting a SRI-project in India, "Growing more rice with less water", implemented by ICRISAT and WWF International.

The use of fertilizers and chemicals within rice growing is an environmental issue and should be addressed. Generally, in SRI it is better to use organic nutrients, as they are better at promoting the abundance and diversity of microorganisms, starting with beneficial bacteria and fungi in the soil. This will promote proper microbial activity, thereby improving production.

Furthermore, the issue of the use of genetically modified organisms (GMOs) should also be discussed. Norwegian policy is not to support the use of GMOs.

The project will be implemented in the Cauvery River Basin which is a river basin with interstate water conflicts. This project could therefore be categorized as conflict sensitive, and the Embassy should follow the implementation carefully to assess potential political risk factors. This is not highlighted as a risk factor in the project documentation but the Embassy's Program Officer has taken steps to reduce the risk by ensuring that the project has been discussed by the Cauvery Water Tribunal.

Conclusions and Recommendations

The follow up of the project and the dialogue with the implementation partners could address the following issues in order to ensure the long term sustainability of the project:

- *The support to this project is considered relevant from an environmental and climate change point of view and will have potential development impacts;*
- *The project could focus more strongly on the key task of adapting to current climate variability and efforts to reduce water consumption within rice growing;*
- *The project should more specifically consider mitigation impacts of various agro technique since agriculture is a larger emitter of GHGs;*
- *Project partners should consider to establish cooperation with TERI to strengthen climate change modeling capabilities if timeframes and budgets allow;*
- *Potential environmental and social impacts of various agro-techniques should be considered, where relevant, including the use of GMOs. The AD has not assessed key cross-cutting issues as environment and gender;*
- *The project is clearly a conflict sensitive project and the Embassy should follow implementation carefully to assess potential political risk factors;*
- *The project should be classified as climate change relevant – climate change policy marker in PTA; and*
- *The project partners should initiate contact with the Norwegian supported (MFA) SRI-program implemented by ICRISAT/WWF to strengthen the SRI dimension.*

2.2.5 IND 3025 – 06/058 Institutional Support and Human Resource Development in Applied Research for Assessment, Prevention, Mitigation and Early Warnings og Tsunamis and Landslides in India

Goals and Activities

The goal of the Project is to reduce natural hazards in India through science and technology interventions with joint efforts from Indo and Norwegian institutions. The specific objectives include:

- To build capacity in understanding of tsunamis in Indian geo-environmental conditions with improved models and devise mitigation measures; and
- To build capacity in greater scientific understanding of landslides in India and develop suitable mitigation measures.

The key planned outputs are:

- Tsunamis:
  - Improved model of wave propagation;
  - Simulated flood inundation model;
  - Development of model for salt water penetration;
  - Education and training programs; and
  - Trained human resource.
- Landslide/slope instability:
  - Zonation mapping;
  - Model for vulnerability and risk assessment;
  - Slope stability analysis for site specific landslide;
  - Evolution of control measures for stabilizing landslides;
  - Development of mitigation measures; and
  - Bilateral seminars.

The project is undertaken by the Department of Science and Technology (DST), Government of India, and the International Center for Geohazards (ICG), Norway.

Climate Change and Environmental Issues Addressed in the Program/Project

All components included in the Program are environment, climate change and natural disaster relevant. The support is considered highly relevant to strengthen the capacity in India on key natural disaster risk areas, and the project attempts to integrate the science and technology input with hands-on approach for mitigation of natural hazards in India.

Assessment of Climate Change Issues

Even though this program primarily aims to strengthen scientific understanding it is necessary that the findings of the program are incorporated in design and planning of infrastructure. Appropriate policies, effective implementation measures and relevantly trained technical personnel are necessary for the checking of designs, enforcement of good building practices and inspection of construction quality throughout the construction process. A major factor for the success and mainstreaming of hazard proof measures in development construction projects is the recognition by development and funding agencies that hazard specialists and civil/structural engineers need to be engaged in the coordination and design of the project and construction works. Possible continuation of the project could include developing more specific guidelines for how to address the issue of landslides in planning and development of infrastructure. Since DST is also responsible for developing standards this should be achievable.

The capacity developed and knowledge created should be used within land use (spatial) planning, natural hazard zoning, and in improving building and construction codes for hazard-resistance. The project could provide support to governments, professional institutions and other national bodies to improve hazard assessment and representation in building codes, adjust codes to account for increasing hazards due to climate change (if codes were based on historical precedent), and improve structural design criteria and land use zoning.

Reducing disaster risks, particularly those likely to emerge as a consequence of climate change, is a long-term process. Therefore there is a need to continue to develop the required capacity. It could be considered to extend the cooperation to focus on other types of natural disasters, e.g. floods, sea level changes and coastal erosion.

The project has effectively increased India's ability and capacity to model the risk of landslides. To increase the policy relevance further it is necessary to strengthen the monitoring system in India, including meteorological, stream flow, sea level gauges, geological and geotechnical monitoring. This is clearly outside the merit of this cooperation but is a critical factor to enhance the policy relevance of the project.

Climate Risk Assessment: 3 – Low

Assessment of Environmental Issues

It is essential that environmental assessments of infrastructure projects and programs cover natural hazards and related risk. The state of the environment is a major factor determining vulnerability to natural hazards. Therefore it could be considered to include work on how to integrate the issue of natural hazards in environmental assessments. Disaster-related consequences of potential projects should be carefully spelt out as part of the environmental assessment process and taken into account in project design.

Conclusions and Recommendations

The follow up of the project and the dialogue with the implementation partners could address the following issues in order to ensure the long term sustainability of the project:

- *The support is considered highly relevant to increase India's capacity to deal with natural disasters and could have key development impacts;*
- *The project's policy relevance should be highlighted and the Embassy should in its dialogue with project partners assess how the results of the project are being used in the revision of design standards og spatial planning; and*
- *The project should be classified as climate change relevant – climate change policy marker in PTA.*

2.2.6 BTN 2564 – BTN 07/002 Support to the Accelerated Hydropower Development Program of Bhutan

Goals and Activities

The Goal of the Program is the accelerated development of the hydropower resources of the country, and for attracting investors for implementation of hydropower projects, thereby leading to socio-economic development and poverty reduction. Furthermore, to ensure the required regulatory capacity to allow the growth of the power sector in an orderly and cost effective manner, and in this way also support the accelerated hydropower development strategy of the 10th Five Year Plan for Bhutan.

The Purpose of the Program on the national scale is the accelerated development of the hydropower resources of the country, and for attracting investors for implementation of hydropower projects. The key planned outputs are:

- Reconnaissance report of all the remaining projects listed in the Power System Master Plan;
- Power sale agreement formats;
- Pre-feasibility reports of project sites;
- Detailed Project Report of one Project; and
- Environmental Report on one Project.

The Program is implemented by Department of Energy in Bhutan supported by the Norwegian Water Resource and Energy Directorate (NVE).

Climate Change and Environmental Issues Addressed in the Program/Project

Development and use of renewable energy reduces the demand for and generation of energy from coal-fired power plants and thus reduces GHG emissions. The main market for electricity produced in Bhutan is India, where the main source of energy is coal. Therefore this project is relevant as a mitigation project.

Environmental issues related to the development of hydropower are of key concern. The project has included a specific activity to assess environmental and social issues associated with one project.

Assessment of Climate Change Issues

Bhutan plans to invest heavily in hydropower in the next decades. Issues such as potentially increased hydrological risk due to expected climate change, increased risk of natural disasters (floods and droughts), landslides and erosion from the upstream catchment area should be considered as future climate change risk factors.

Changes in precipitation, and the associated changes in water flow in the rivers, may impact the economy of the projects. Likewise, changes and fluctuations in water flow may affect the flooding pattern in regulated rivers and the environment both in and around the rivers, as well as people along the rivers. Evapotranspiration from reservoirs could also be affected, although in most cases run-of-the-river projects will be developed. It would therefore be appropriate both to improve the prognostic basis for variation in water flows and temperatures, and make use of the best available prognosis in the feasibility studies and the EIAs. One vehicle to improve the climate change prognosis and to apply them would be to improve the knowledge base and the capacity in research institutions as well as in the administration on these issues. A role for the institution providing technical support could be to promote cooperation on research and education on these issues in Bhutan as well as in Norway. Furthermore, training programs should also include environment and climate change relevant issues.

Hydropower is eligible for financing support through the CDM mechanism and the cooperation could include assistance to consider the scope for attracting CDM finance to this sector in Bhutan.

Achieving effective disaster risk reduction requires developing a better understanding of the study region's hydro-meteorological character. The collection, collation and dissemination of data on rainfall, river flow, sediment-load and geomorphology are essential. To capture the variability exhibited by micro-climates, more stations to monitor rainfall and other climatic parameters are needed in the country. A key concern associated with hydropower development in the Himalayas is Glacial Lake Outburst Floods (GLOFs).

Climate Risk Assessment: 1 – High

Assessment of Environmental Issues

Bhutan has the appropriate framework in place for the preparation of SEAs (Strategic Environmental Assessment) and EIAs (Environmental Impact Assessment).

Of key concern in the long-term are changes to land use upstream of the planned power plants and potential impacts on sedimentation and changes in stream flow. The project developers need to follow the development carefully and should consider implementing Payment for Ecosystem Services (PES) to local communities to preserve the environment, including maintaining forest cover. A monitoring system needs to be established to monitor future changes upstream of planned hydropower plants.

It will also be important to ensure rural electrification through the use of renewable energy in areas affected by hydropower development, e.g. through the use of solar, wind and micro hydro.

Conclusions and Recommendations

The follow up of the project and the dialogue with the implementation partners could address the following issues in order to ensure the long term sustainability of the project:

- *The project is considered very relevant to increase access to clean energy in Bhutan and India as the main market as a mitigation strategy;*
- *The Embassy should encourage the partners in the project to document the potential GHG implications of hydropower development in Bhutan;*
- *Long-term climate change will pose an additional risk to the development of hydropower in Bhutan in terms of changes in stream flow and flow pattern, increased sedimentation and higher risk of floods, droughts and landslides, including GLOFs;*
- *Training programs should include relevant issues related to environment and climate change and potential cooperation between the Royal University of Bhutan and similar institutions in Norway could be considered;*
- *The use of other renewable energy sources in Bhutan, e.g. solar, micro hydro, wind and biomass, could also be part of the cooperation to complement hydropower and to provide rural electrification in areas where hydropower is being developed;*
- *The Embassy should include a separate agenda item on climate change, environment and social issues in all Annual Meetings; and*
- *The possibility of using CDM finance in hydropower development should be explored.*

2.3 Support to the Health Sector

General Observation

Climate change will affect, in profoundly adverse ways, some of the most fundamental determinants of health: food, air and water. The health sector, at international, national and sub national levels, has a responsibility, political leverage and staff with many of the necessary skills to protect the public from climate-related threats to health. Health professionals bring an understanding of primary prevention (analogous to strategies to mitigate climate change) and secondary prevention (analogous to measures for adapting to climate change) to the discussion of how to reduce and prevent climate-related disease, injury and death.

Mitigating the effects of climate change can have direct and immediate health benefits. A number of proposed mitigation strategies may improve health. For example, lessening the reliance on coal-fired generation of power will reduce air pollution, and associated respirato-

ry and cardiopulmonary disease and death. Providing opportunities for the use of active transport (bicycling and walking) can also reduce levels of ambient air pollution, traffic-related injury and death, and obesity rates. Production and transport of food, especially red meat in developed countries, are major emitters of greenhouse gases. Eating foods that are grown locally and those that are lower in the food chain (e.g. fruits, vegetables and grains) will help to reduce the risk of climate change and to lower risks of coronary artery disease, stroke, hypertension, obesity and diabetes. Estimated direct and indirect health-care costs and lost income due to several environmental illnesses (e.g. those caused by air pollution) often match or exceed the expenditure needed to tackle the environmental hazard itself.

Health interventions could usefully be used to address climate change:

- to ensure that concerns about public health security are placed at the centre of the response to climate change;
- to implement adaptive strategies at local, national and regional levels in order to minimize impacts of climate change on the health of human populations; and
- to support strong actions to mitigate climate change and to avoid further dramatic and potentially disastrous impacts on health.

2.3.1 IND 3053 – Norway-India Partnership Initiative (NIPI)

Goals and Activities

The aim of the partnership is to facilitate rapid scale-up of quality child related health services that are equitable and sustainable in five high focus states.

The partnership focuses on the following areas:

- Strengthen the Government of India's initiative, the "National Rural Health Mission" (NRHM), by supporting an independently managed enabling network, facilitating delivery of MDG 4 related services;
- Test and introduce new ways of scaling up quality services by community health workers (ASHA - Accredited Social Health Activist at the village level in 5 focus States), including their support needs and referral requirements ("ASHA chain");
- Involvement of private sector in the delivery of MDG 4 related services at all levels; and
- As the implementation of the NRHM-MDG 4 related activities unfold, there will be a continued need to explore new opportunities as they arise. The partnership will operate on flexible basis providing up front catalytic financial support, and facilitate engagement of international and national expertise as deemed necessary.

The NIPI is intended to provide an up-front, catalytic and strategic support and accelerate the implementation of the NRHM in five states that comprise of 40% of India's total population and account for around 60% of child deaths: Uttar Pradesh, Bihar, Madhya Pradesh, Rajasthan and Orissa. NIPI will be implemented as a part of the NRHM, which is the overarching, comprehensive, nation-wide and long-term health plan of the country. About 2.4 million children under the age of five die every year in India, of which 1.4 million die in the 5 NIPI focal states. Within the overall framework of the NRHM, NIPI focuses on newborn and child health.

Climate Change and Environmental Issues Addressed in the Program/Project

The Program strengthens the broader platform of health services, particularly at primary level across the country; hence this program is responsible for buttressing the current health-care systems across the country. This builds the general level of adaptive capacity. Evidence suggests that reproductive and child health interventions are among the most cost-

effective health interventions available in terms of cost per disability-adjusted life-year (DALY) gained.

There are certain elements related to environment in the program, mainly related to training in hygienic practices and issues related to water and sanitation that should be addressed.

Assessment of Climate Change Issues

Global warming is expected to pose direct threats to health by causing more severe storms, floods, droughts and fires, with consequent disruptions in water and food supplies and medical and other services. Higher temperatures will change the distribution, and increase the burden, of various vector-borne, food-borne and water-related infectious diseases. Some studies indicate that with expected increase in temperature and humidity that many states of India may have transmission windows open for all 12 months. The worsening of air quality, both indoor and outdoor, increases the prevalence of asthma and respiratory infections, the number of admissions to hospital, and days of work and schooling lost. Meeting increasing energy demands by greater use of fossil fuels will tend to increase the number of cases of these air pollution-related illnesses and all-cause and all-age premature deaths. Greater frequency and intensity of heat waves will increase mortality and the incidence of heat stress and heat stroke.

There are a number of potential climate risks associated with the Program that could be addressed through the policy dialogue:

- Damage to healthcare infrastructure such as medical equipments along with damage to the storage facilities for medicines and other healthcare items (e.g. vaccines, sterilization material, aseptic surgical instruments);
- Damage to potable drinking water supplies, leading to spread of water-borne diseases such as cholera and diarrhea;
- Damage to road and transport infrastructure impeding the supply of healthcare services to the communities;
- Lack of and/or damage to power supply thereby hampering key medical care facilities such as storage of blood samples, neonatal and emergency ward care and storage of vaccines;
- Under extreme weather conditions, associated problems such as water logging and collection of debris (inclusive of living and dead material) increase the chances of infection and risk of epidemic outbreaks; and
- The level of sanitation within the medical facility might also be affected as a result of climate variability and change (such as excess precipitation, temperature, water logging creating favorable conditions for breeding of mosquitoes and increasing chances of malaria).

Furthermore, there are additional opportunities for climate risk management and adaptation through identification of the vulnerable areas which are prone to climatic extreme events, and the health facilities in and around these vulnerable areas through regional surveys and GIS mapping of these facilities by state health departments under the NRHM. The identification and mapping exercise could highlight:

- Access routes available to reach the health facilities;
- Infrastructure required to retrofit/upgrade the health facilities to make them more resistant to climatic variations;
- Current carrying capacity of the facility and the number of cases that the facility could possibly accommodate in cases of epidemics or emergency; and
- The ability of the healthcare system to organize periodic outreach visits and provide free/subsidized medical care to the vulnerable areas.

Sensitizing policy planners and decision-makers regarding the health risks in the region due to exposure to extreme events, climate variability, and the potential impacts of climate change on incidence of extremes should also be considered. This is an essential building block for incorporating risk management into the local (state and district) planning process.

It is suggested that the issue of existing climate variability, natural disasters, climate change and potential impacts on the health sector is included in the overall policy dialogue at appropriate points with a view to raise awareness and understanding of the need for the health system in India to start considering immediate implication of climate variability and long-term implications on health service delivery of climate change.

Climate Risk Assessment: 2 – Moderate (long-term impacts)

Assessment of Environmental Issues

The NIPI program primary focus is on the pre-natal health care support. To bolster the effects of the program the focus on environmental health affecting all under five children could be included. Improvements in environmental health are very important for child survival and development, especially considering its linkages though malnutrition. The epidemiological underpinnings of the infections-malnutrition cycle are important because repeated infections cause a decrease in dietary intake, producing, e.g., malabsorption of nutrients which in effect cause malnutrition, making children weak in resisting disease and thereby falling sick again.

Until recently, the impact of diseases such as diarrhea and respiratory infections on malnutrition in children was relatively ignored. Over the last several decades, dozens of studies – many of them long term cohort studies – have investigated the causal relationship between disease and malnutrition, and have provided strong evidence of how almost all infections influence a child's nutritional status. Evidence from several of these studies demonstrates how the exposure to environmental health risks in early infancy leads to permanent growth faltering, lowered immunity and increased morbidity and mortality.

Environmental health inputs – both at the household and community level – play a critical role in a child's survival and growth. In the life cycle of a child, environmental health interventions are critical, especially in the period from the womb to the age of about two years. This is the so-called "window of opportunity." Pregnant women in developing countries are often exposed to environmental risks such as malaria and hookworm infections which contribute to poor fetal growth and result in low birth weight babies. Smoky kitchens from use of biomass fuels have anecdotally revealed impacts on low birth weight and perinatal mortality. In early infancy, improper feeding practices and poor sanitation have a pernicious synergistic effect on the child's nutritional status. Many of these impacts on a child's growth have also been seen to result in cognition and learning impacts as well as chronic diseases later in life. Hygiene and sanitation also help to control many non-fatal diseases which afflict young children, such as intestinal parasites, etc.

Current child survival strategies in developing countries mostly adopt a rather treatment-oriented perspective, relying mainly on case management and focusing primarily on reducing mortality. Most of these strategies, while intended to increase the ability of the host to resist or reduce infection once exposure has occurred, do not attempt to reduce the exposure to environmental determinants of ill health. Therefore the NIPI program could explore how the NRHM could include appropriate environmental health actions to complement and supplement strategies that focus on child health. Environmental health actions add value to existing child care, micronutrient supplementation and immunization programs.

A number of environmental health interventions could be considered, including:

- In line with the Norwegian government's objective to secure all people the right to water, improved hygiene and sanitation, including better sanitation facilities for both women and men, and hand washing with soap, should be considered. The need to walk long distances to a convenient defecation site, or to wait until nightfall is particularly onerous in the later months of pregnancy and leads to urinary infections. Sanitation makes it possible for mothers-to-be to relieve themselves when convenient, and close to home where help is at hand;
- Providing safe drinking water and latrines at health centers and clinics, taking gender specific needs into account;
- Include rainwater harvesting in health centers and clinics. Health centers in drought-prone areas such as Rajasthan can experience extreme water shortages, especially in the summer season;
- Access to improved sources of drinking water and cleaner household energy sources, saving time children spend collecting water/fuel; and
- Promote use of insecticide treated bed nets (ITNs) and indoor residual spraying.

Some of these measures are probably already included in the NRHM, however, through the NIPI program the Embassy could engage in a wider dialogue with GoI on these issues. Accreditation of health facilities should also include provision of adequate water supply and sanitation facilities.

Through the NIPI program, several training programs are executed at various levels, targeting the support structures set up by the program. NIPI could consider strengthening and including key issues related to hygiene, sanitation, water supply and indoor cooking in the respective training programs. Training of ASHAs could specifically include training on hygienic practices in the household and childcare, including hand washing, use of soap, washing of hands before cooking, use of fuel for cooking, washing and storage of food, safe storage of water, use of latrines, management/re-use/recycling of waste, disposal of household waste water (grey water), nutrition, etc. A World Bank analysis found that hygiene promotion was the most cost-effective of all interventions to control high-burden diseases in the developing world. Hand washing with soap could also prevent acute respiratory infections by interrupting the route of infection from contaminated hands.

The training elements identified above could also be included in training of child health officers (supervisors, managers, deputy mangers etc.) and Yashodas[6]. The state media and communication consultant could also be engaged to develop appropriate communication tools focusing on hygiene and sanitation. In the NIPI birthing kit and in the sick newborn care units soap for hand washing should be included and made available.

The lack of stable and reliable power supply in health care facilities such as hospitals, clinics and medical cold storages at village level, may reduce the impact of improved delivery capacity of appropriate health services. The establishment of a new Norwegian-supported PPP (public-private partnership) initiative on solar energy based village electrification may be an opportunity for NIPI villages to address this problem. The solar project will select 30 villages for pilot establishment of multi-utility solar systems. Linking this to the NIPI program by including some of the NIPI villages in the pilot, could mutually reinforce the impact of both programs; increasing the social development effect of the solar project and improving the NIPI-related health services.

[6] Yashoda = Hindi word meaning "foster mother".

Risk Screening Summary and Recommendations

Identified Climate Risk	Climate Risk Management and Adaptation	
	Current Practices	**Opportunities**
• Damage to healthcare infrastructure • Damage to drinking water supplies • Damage to communication networks and power supply • Spread of diseases and risk of epidemic outbreaks • Ongoing challenges posed by existing climate variability and natural disasters.	• Bolsters national health care program, targeting reducing maternal and infant mortality rates • Environmental management practices, including for clinical waste.	• Assess current climate and natural disaster risks to the health sector • Health facility mapping in vulnerable areas • Sensitizing policymakers to addressing health concerns due to exposure to extreme events in the respective vulnerable regions • Convergence with programs centered around issues such as sanitation and provision of quality drinking water.

The follow up of the project and the dialogue with the implementation partners could address the following issues in order to ensure the long term sustainability of the project:

- *The support to NIPI is in the short-term not subject to climate change risks, however, current climate variability and natural disasters pose challenges to the health sector that needs to be addressed. These and issues related to long term impacts on the health sector and implications for service delivery should be brought into the policy dialogue at relevant levels. The NIPI Steering Committee could put the issue on the agenda and the Embassy could facilitate this discussion;*
- *The nexus of environment, nutrition and health and the need to target interventions in this area could also be discussed at the policy level;*
- *A number of environmental health interventions would support the achievements of the overall objectives of the NIPI program. Without a clear focus on hygiene, sanitation, water supply and nutrition within the NRHM the intended reductions in under five-mortality are not likely to be achieved. The Embassy should in its dialogue with NIPI bring up the issue of environmental health interventions and the importance of focusing on these;*
- *The Norwegian government supports work to secure all people the right to water;*
- *The Embassy should ensure that the various training programs provided by NIPI also include issues related to hygiene, sanitation, water supply and energy use;*
- *Soap for hand washing should be included in the NIPI birthing kit; and*
- *Encourage communication with the planned solar energy PPP project to consider integration of some NIPI villages in the pilot.*

2.4 Support to Culture

General Observations

Cultural cooperation can be used to facilitate a dialogue platform for environmental and climate changes issues. Music and visual arts can be effective media to promote various messages to the broader public. There are numerous examples of events that use cultural performances and activities as a channel to promote awareness on climate and ecological issues, such as festivals and concerts, but also less obvious opportunities as linking with artist to highlight scientific research and findings. To our knowledge most of such initiatives are taken in the West, however culture has been used as a channel for other types of awareness building in development cooperation, and could be a vehicle worth exploring in the efforts to build awareness about climate change among population groups in developing countries.

2.4.1 IND 3062 – 08/014 – Music Collaboration India – Norway for the Period 2008 - 2012

Goals and Activities

The main objective for the musical collaboration between India and Norway is to contribute to creating mutual insight into and respect for the two countries' musical traditions, contribute to a mutual corroboration of competence, add to the infrastructure and provide an increased exposure of both countries' music and culture in connection with this. In addition, the program should contribute to an increased focus on this cross-cultural activity through increased exposure in the media, which will strengthen the conception of Norway as a credible and beneficial collaborator for Indian musical milieus.

The larger part of the musical collaboration will consist of an exchange program. Moreover, the following elements are emphasized, both as separate activities in their own right and/or as integral parts of the exchange program:

- Workshops and teamwork between musicians from both countries involved;
- Activities aimed at children and young people, in addition to school concerts;
- Other musical and strategic measures that may contribute to the new Strategy for India as proposed by the Norwegian Government; and
- Promotion of Norwegian commercial interests when relevant to the Program.

The project is implemented by Norwegian Concerts in cooperation with Spic Macay (SM),

Climate Change and Environmental Issues Addressed in the Program/Project

None.

Assessment of Climate Change and Environmental Issues

SM is an organization working with culture promotion and education through culture on a large basis throughout India. The organization works through an extensive network of artists, and organizes approximately 2,000 concerts and other events for cultural performance per year, reaching an audience of youth and children at 1,200 schools and colleges.

The events are often used as a platform for communicating various messages to the youth. These are not imposed on the artists, and the messages shall not dilute the main music/cultural message. The artists have the discretion to set up their own concerts and performances, and include themes beyond the cultural message according to their own preferences. SM's network of artists includes some of India's most known environmentalists, and issues related to environment protection and climate have been touched at several occasions.

Children can be effective 'agents of change' and are important targets in building awareness in society. Indo-Norwegian cultural events targeted at children could be effectual occasions to promote messages related to the notion of a common planet and a common future, as well as to convey values and good practices. It could be explored whether there are artists in the program who already are working to promote environment or climate issues, or whether such artists should be included in the program. Using the occasion of visits by Norwegian artists to events at Norwegian Embassy related to the development cooperation on environment and climate change, could be another opportunity for the Embassy to strengthen the publicity of both the cultural cooperation and the cooperation on environment and climate change.

Climate Risk Assessment: 3 – Low

Conclusions and Recommendations

The cultural exchange program's focus of children and youth makes it a potentially effective platform for reaching this important population group with messages related to environment, climate change and common values. The Embassy could raise the following issues in the dialogue with the partners in planning events under the program:

- *Whether artists in the program have experience working with environment and climate related issues in their performances, which could be used in their performances in India;*
- *Whether it would be relevant to actively seek artists promoting such messages to be included in the program;*
- *The possibility to use the occasions of visits for side-events/lectures related to environment and climate by Indian cooperation partners;*
- *The possibility of using Spic Macay's network and outreach activities to raise awareness and increase understanding on key issues; and*
- *The above points might also be relevant for Indian artists visiting Norway.*

2.5 Support to Private Sector Development

General Observations

The support to PSD activities in India is not necessarily aligned with the key strategic priorities of Norway. The possibility to influence the interest of Indian and Norwegian private sector to concentrate on specific sectors could be limited, however, through aligning the support to private sector with the key priority areas for Norwegian cooperation with India Norway could be a more coherent actor. A strong case could be made to align private sector support to clean energy, climate and environment, bearing in mind that Norway has a limited number of companies catering to niche segments in this market. This could become a proactive case of promoting '*do good'* measures and potential opportunities could be explored.

The close integration of Innovation Norway's (IN) activities in the Embassy may be an opportunity to establish closer links between the private sector and the Embassy's portfolio of development cooperation projects. This could contribute to establishing important links between technology development-oriented research and business, potentially improving realism and sustainability; as well as inform Norwegian companies about opportunities in the Indian market. In particular, the TERI Framework program of activities may contain several such opportunities.

The potential 'Green Ships initiative' provides another opportunity for integrating the environment and climate related agenda with the PSD strategy.

2.5.1 IND 3055 – 06/059 Match Making Program India

Goals and Activities

The goals and activities of the Match Making Program (MMP) are not clearly described in the AD or in the contract between Norad and IN New Delhi. According to IN, the overall goal is to contribute to poverty reduction through job creation and technology transfer to India. The program aims to achieve this through promoting partnerships between Norwegian and Indian companies.

IN's Head Office in Oslo and IN in New Delhi are given the roles of National Contact Points (NCP) for Norwegian and Indian companies, respectively. Norwegian companies that are

interested in partnerships with Indian companies apply to the NCP in Oslo to participate in the program, while the NCP in New Delhi identifies Indian companies to present to the Norwegian company as potential partners. In order to accomplish this task, IN works through a network of regional contact points and sector specialists.

In addition to the partner identification services, participating companies are granted support to cover part of their costs for travelling to India.

In 2008, a total of 17 new companies were allowed into the program, in addition to another 7 companies from earlier years. In 2008, 9 Norwegian companies visited India to meet potential partners. Most of the visiting companies identified potential for establishment of partnerships with one or more of the Indian candidates, and are developing plans for follow up. The experience of these companies indicates that Indian companies generally have highly developed skills/personnel, while a lot remains to be done to strengthen middle and top management.

While the program does not have a strategic sector focus, maritime/shipbuilding and oil & gas emerge as the most important sectors for manufacturing partnerships such as Joint Ventures (JV). For outsourcing services, most of the companies belong to the information technology sector.

Climate Change and Environmental Issues Addressed in the Program/Project

The program does not have a particular focus on climate change or environmental issues as such. Companies within the sectors of environment or climate change related technology have so far only to a limited extent showed interest in the program. However, efforts made by the Head Office in Oslo to promote Norwegian Energy and Environment related technology, are linked to a certain pick-up of interest in recent months, e.g. in the wind energy sector. The informal network IN works through also includes agents with knowledge and experience from these sectors.

IN New Delhi is actively considering CSR (Corporate Social Responsibility) issues as part of the screening of potential partner candidates for Norwegian companies, focusing on Health, Environment and Safety issues. No particular focus on CSR is included in the screening of Norwegian companies, which is the responsibility of the Head Office in Oslo.

Assessment of Climate Change and Environmental Issues

The risk of direct impact of climate change on the program is low. The manufacturing and IT sectors are mainly working in cities, rarely targeting the poorest segment of the population or operating in the most vulnerable areas. (Extreme forms of weather could in isolated cases have influence on the operation of individual companies, but this is not considered a major threat to the operation or success of the program.)

The way business is done can potentially have an impact on the environment, for example through emissions or handling of hazardous waste. Good environmental practices in the Norwegian companies, on the other hand, can be transferred to Indian. These issues are not considered in the assessment of the program nor explicitly emphasized in the operation of the program. The screening of Indian companies, however, does contain considerations of the companies' environmental standards. This is commendable.

The screening of Norwegian companies is the responsibility of the Head office in Oslo, and IN New Delhi is not directly involved in the development of routines for this screening. It should be noted that a similar program implemented by the IN office in Hanoi (Vietnam) is currently in the process of developing standards for CSR, with the aim of both helping Viet-

namese companies comply with the requirements Norwegian companies normally would pose on potential partner companies, and of guiding the Norwegian companies on ways to gradually improve CSR related issues, including environmental practices, in their Vietnamese partners. Engaging in this work in cooperation with Head Office could be an opportunity for IN New Delhi to strengthen CSR/environment aspects in the India MMP.

IN's possibility to influence the interest in India or in the program of companies from any particular sector is limited. Still, there could be a case for the program to build its competence and ability to provide relevant partner searches for Norwegian companies in the field of energy, environment and climate change related technology, as indicated above: First, the Head Office's initiative to promote these technologies could be used as an arena for promoting opportunities in the Indian market. Secondly, the Norwegian Embassy's strategy for Private Sector Development identifies Energy and Environment as one of three focus sectors. Aligning IN's sector orientation with the Embassy's strategy could strengthen this focus. Finally, the Embassy's portfolio of development cooperation projects and programs has a strong climate and environment focus, and includes research and development of new, relevant technologies. Linking the private sector to such projects at an early stage could have a positive effect on the sustainability of the projects and at the same time provide potentially interesting areas of investment from the (Norwegian) private sector.

It should be acknowledged that 'environment and climate change related technology' is a broadly defined sector, including a host of different technologies, and that Norwegian businesses are not necessarily competitive in all these. Identifying niches with opportunities for linking Norwegian ideas with Indian competencies for technology development could prove an interesting venture for IN. While recognizing that this does not fit into the program as it is set up today, this idea could be considered for future adjustments of the program, or for new initiatives outside the program.

Climate Risk Assessment: 3 – Low

Conclusions and Recommendations

In order to strengthen the environment and climate change aspects of the Match Making Program, IN, the Embassy and Norad could consider:

- *Defining a sector focus, e.g. renewable energy and energy efficiency, for the program in line with the Embassy's strategy for Private Sector Development (Maritime, Oil & Gas, Energy and Environment);*
- *Strengthening the focus on environmental practices and standards of participating companies, both Norwegian and Indian, through implementing routines for CSR and ILO standards screening in cooperation with Head Office;*
- *Identifying opportunities for the private sector to engage in ongoing efforts on R&D projects in the Embassy's portfolio; and*
- *Identifying niches related to environment and climate change with potential for partnerships between smaller Norwegian companies with 'good ideas' and Indian companies with relevant skills and competence to unleash the creativity and entrepreneurship, possibly within biomass, wind, small hydro, solar.*

2.6 Green Buildings and Greening of the Embassy

Construction of New Buildings

The Embassy is in the process of designing an extension of the existing buildings on the Embassy compound to respond to needs for more space. This presents the opportunity for the Embassy to create the first Norwegian 'Green Embassy' and to use the Embassy actively to show case environmental and carbon friendly solutions and technologies.

In accordance with normal procedures, Statsbygg will be in charge of the design and will own the buildings, while the MFA will finance the operational costs. There have been discussions between the Embassy and Statsbygg regarding the possibility of building a 'green embassy'. Statsbygg have not refused the idea completely, but the financial implications have not been fully considered. Statsbygg have provided initial drawings for the new buildings, which include refurbishment of the existing Embassy, a new visa section and a new housing section.

On this backdrop, the Team was invited to share their ideas on: 1) how to improve the Embassy's and the staff's practices in order to reduce their footprints; 2) possible solutions to be included in the designing of the new buildings in order to create a carbon/emission neutral embassy; and 3) strong arguments for Statsbygg/MFA to decide to build a Green Embassy.

The team is of the opinion that a carbon neutral embassy is possible to achieve. A host of available techniques and solutions are available.

Green building is the practice of increasing the efficiency with which buildings use resources — energy, water, and materials — while reducing building impacts on human health and the environment during the building's lifecycle, through better siting, design, construction, operation, maintenance, and removal. Green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment by:

- Efficiently using energy, water, and other resources;
- Protecting occupant health and improving employee productivity; and
- Reducing waste, pollution and environmental degradation.

The related concepts of sustainable development and sustainability are integral to green building. Effective green building can lead to: 1) reduced operating costs by increasing productivity and using less energy and water; 2) improved public and occupant health due to improved indoor air quality; and 3) reduced environmental impacts by, for example, lessening storm water runoff and the heat island effect. Practitioners of green building often seek to achieve not only ecological but aesthetic harmony between a structure and its surrounding natural and built environment, although the appearance and style of sustainable buildings is not necessarily distinguishable from their less sustainable counterparts.

Green building brings together a vast array of practices and techniques to reduce and ultimately eliminate the impacts of buildings on the environment and human health. It often emphasizes taking advantage of renewable resources, e.g., using sunlight through passive solar, active solar, and photovoltaic techniques and using plants and trees through green roofs, rain gardens, and for reduction of rainwater run-off. Many other techniques, such as using packed gravel for parking lots instead of concrete or asphalt to enhance replenishment of ground water, are used as well. Effective green buildings are more than just a random collection of environmental friendly technologies, however. They require careful, systemic attention to the full life cycle impacts of the resources embodied in the building and to the resource consumption and pollution emissions over the building's complete life cycle. There is expertise in India and Norway on these issues and the Embassy has already entered into dialogues with relevant institutions.

A key issue related to climate change is the use of energy. Green buildings often include measures to reduce energy use. To increase the efficiency of the building envelope (the barrier between conditioned and unconditioned space), they may use high-efficiency windows and insulation in walls, ceilings, and floors. Another strategy, passive solar building design, is often implemented in low-energy homes. Designers orient windows and walls and place awnings, porches, and trees to shade windows and roofs during the summer while maximiz-

ing solar gain in the winter. In addition, effective window placement (day lighting) can provide more natural light and lessen the need for electric lighting during the day. Solar water heating further reduces energy loads. Finally, onsite generation of renewable energy through solar power, wind power, or biomass can significantly reduce the environmental impact of the building. Power generation is generally the most expensive feature to add to a building. It is possible to construct buildings that are net producers of energy.

To reduce the impact on wells or water treatment plants, several options exist. "Greywater", wastewater from sources such as dishwashing or washing machines, can be used for subsurface irrigation, or if treated, for non-potable purposes, e.g., to flush toilets and wash cars. Rainwater collectors are used for similar purposes.

Measures to Reduce Environmental Footprints of the Embassy

The Embassy has already taken certain steps to reduce their footprints, including:

- Replacing electricity with gas as energy source for cooking;
- Replacing electricity with solar as energy source for water heating; and
- 3 rainwater wells in the ground. Toilets in staff quarters and water for lawn watering are connected to this source, reducing the use of treated municipal water. Lawn watering will be automatized with a timing system.

Also in the operation and daily chores, the Embassy can establish new routines which contribute to reducing their environmental footprints. The options are many and every individual can contribute to generating ideas – the fantasy sets the limits. Some ideas that were tossed around in the discussion included:

- Phase out the use of diesel generators;
- Shift light bulbs to energy efficient LED bulbs;
- Establish routines for switching off lights when leaving offices or rooms, or install automatic switches;
- Allow a higher indoor temperature;
- Print and copy on both sides of paper, and consider the need for printing and copying;
- Turning off computers and other appliances instead of using stand-by;
- Reuse of grey water for e.g. toilet flushing;
- When replacing electric appliances, find low energy-consumption appliances;
- Reduce waste or recycle/compost;
- Consider types of grass and plants reducing the need for water in the garden(s); and
- Consider the transport routines, type and use of vehicles.

In order to measure the effect and be able to document carbon neutrality, the Embassy should calculate their current energy and resource consumption based on data from water meters, electricity meters, gas meters, kilometers driven or liters of fuel consumed, and so forth. Using these data it is possible to estimate the emissions using conversion factors.

Carbon neutrality can also be achieved through offsets, e.g. support to NGO projects in the voluntary carbon market. Planting trees, e.g. during an Embassy retreat, is another way which in addition to offsetting emissions, can have a positive signal effect on public diplomacy, and build awareness and ownership to climate issues among the staff.

Recommendations

In the implementation of efforts to "green" the Embassy the following could be considered:

- *Assess experiences from development partners (e.g. the World Bank has "greened" it's headquarter in Washington DC), other Norwegian embassies (the Norwegian Embassy in Washington DC has prepared an environmental action plan) and the*

Norwegian supported efforts to green the UN, including through the One Green UN house in Vietnam.

- *Engage actively with Statsbygg and its advisors in the further planning of the expansion/reconstruction of Embassy buildings and the compound;*
- *Organize a tree planting retreat for Embassy staff as a social activity and as a practical contribution to offsetting GHG emissions from the Embassy;*
- *Institute an Embassy "green award" – reward Embassy staff that have made a particular contribution to the greening of the Embassy; and*
- *Prepare an internal "greening" of the Embassy plan with the view to reduce the environmental and GHG footprints of the Embassy's operation.*

ANNEX I: TERMS OF REFERENCE (TOR)

Terms of Reference

India:
Climate Change Screening ('Climate Proofing') and Environment ('Greening of the Portfolio')

1. Purpose

The overall purpose of the assignment is fourfold:

- Undertake a **review** of selected projects and programs in the Embassy's portfolio in order to assess the climate sensitivity and vulnerability of the activities supported by the Embassy and to identify possible ways and means of addressing/integrating appropriate environmental concerns in the current agreements within present framework and budgets, and for possible future phases of the various programs.
- Provide Embassy staff with updated information regarding the implementation of the government's environmental action plan and relevant climate change activities through a **training** seminar.
- Provide **strategic advice** to the Embassy on the "Strategy for Indo-Norwegian Collaboration on Energy, Climate Change and the Environment"
- Provide advice to the Embassy how the **environmental and climate footprints** of the Embassy could be reduced – i.e. "greening of the Embassy".

2. Scope and Approach

The suggested scope and approach to the Review is as follows:

1. **Identification of development programs subject to review**. The Embassy identifies a representative selection of the portfolio of development programs to be reviewed covering all key sectors the Embassy is supporting. The selection should be discussed with the Review Team prior to finalization of the ToR for the Review. The following projects/programs should be reviewed:

PTA number and name	Agreement Partner
IND 3053 – Norway-India Partnership Initiative (NIPI)	Government of India
IND 3025 – 08/049 TERI – Frame Funding for Institutional Cooperation Confronting Climate Change	The Energy and Resources Institute (TERI)
IND 3025 – 08/046 Bioforsk – IITK Solar Energy for H2-Production Combined with CO2-Capture	Bioforsk
IND 3025 – 08/047 – Climate Change Impacts on River Basins	Bioforsk
IND 3025 – 06/079 Climate Change and Persistent Droughts - Impact, Vulnerability and Adaptation in Rice Growing Sub Divisions of India	Bioforsk
IND 3025 – 06/058 Institutional Support and Human Resource Development in Applied Research for Assessment, Prevention, Mitigation and Early Warnings og Tsunamis and Landslides in India	International Centre for Geohazards
BTN 2564 – BTN 07/002 Support to the Accelerated Hydropower Development Program of Bhutan	Gross National Happiness Commissions
IND 3062 – 08/014 – Music Collaboration India – Norway for the Period 2008 - 2012	Concerts Norway
IND 3055 – 06/059 Match Making Program India	Innovation Norway

2. **Desk review of available documents**. The Embassy will submit relevant program/project documents to the Review Team. The Review Team will undertake an initial desk study upon the visit to the country. Through the desk review the Team will identify key issues that subsequently should be discussed with Embassy staff and with representatives of cooperation partners in the country. The Review Team should discuss the Review with Norad's country team as well as the other 4K-topics

(gender, anti-corruption and conflict sensitivity). The aim of this discussion is to solicit ideas from a wider group on relevant environment and climate change issues to be considered in the various programs and projects subject to the Review.

3. **Internal Training Seminar and Kick-off meeting with the Embassy**. The Team meets with the Embassy to assess the need for additional documents, meeting schedule and other practical matters. The Team should also meet with relevant Embassy staff responsible for the development programs subject to the review. The Internal Training Seminar should focus on:
    a. Presentation of the implementation of the Norwegian Environmental Action Plan and key climate change issues (REDD, adaptation, mitigation, clean energy)
    b. Environmental Assessment of Development Cooperation Projects
    c. Presentation of 'Practical Guide – Climate Change Risk Management – Climate Proofing'
    d. Clean Development Mechanism – presentation of Norad's funding instrument

    The seminar will mainly be based on presentations and interactive discussions with Embassy staff. All staff members at the Embassy should preferably attend.

4. **Meetings with key stakeholders in the country**. The Embassy will organize meetings (about 2 hours for each meeting) with key stakeholders for each program/project subject to review. At the meeting the Team will be given information on the key activities in the development program, discuss on-going program/project activities of relevance to climate change and environment and discuss ideas and options for inclusion of new environment-related elements and to assess the climate change sensitivity and vulnerability. A meeting with the key entity responsible for climate change issues in the country should be organized.

    Through these meetings additional information on the selected development programs will be collected, updated information on the status of project implementation will be received and the preliminary findings of the Desk review discussed. Through these discussions the scope for 'do good' and 'do no harm' will be discussed. The 'do no harm' discussions will be based on the country's legal framework and the obligation to ensure that assessments of environmental and social impacts are carried out in connection with the use of Norwegian development cooperation funds. The 'do good' discussions will mainly be based on the Review Team's broad environmental knowledge and competence and ideas provided by representatives of cooperation partners.

    The Embassy should, preferably, participate in these discussions to create ownership, however, it is important to stress that this does not imply that the Embassy endorses ideas and suggestions made by the Review Team during these discussions.

5. **Strategic climate change advice**. The Embassy is preparing "A Strategy for Indo-Norwegian Collaboration on Energy, Climate Change and Environment". The Team will provide views and input to the drafting of the Strategy and through discussions with the Embassy provide strategic advice on implementation of the strategy, including how Norad can contribute.

6. **"Greening of the Embassy"**- The Embassy is interested in enhancing its' environmental performance and reducing its environmental footprints. The Team will provide advice on what measures that could be taken to reduce the environmental footprints of the Embassy.

7. **Drafting of report**. The Review Team will prepare a draft report, including a summary of key findings, upon departure. In addition to sections outlining the approach and methodology the report will present each development program subject to Review in the following manner:
    i) brief description of goals and activities;
    ii) climate change risk assessment;
    iii) environment-related activities included;
    iv) assessment of climate change impacts and scope of integration of environment; and
    v) recommendations.

    The report will as briefly address the other issues identified in the scope of work, i.e. input to the Indo-Norwegian energy, climate change and environment Strategy and the "greening of the Embassy".

8. **Wrap-up meeting with the Embassy.** The Review Team will meet with the Embassy and present the key findings, conclusions and recommendations.

9. **Preparation of Final Report.** The Team will forward draft report to the Embassy for approval. Norad will also undertake internal quality assurance of the report. Based on comments from the Embassy and Norad's internal quality review the final report will be prepared by the Team.

10. **Distribution of the Final Report**. The final report should be distributed to cooperation partners in the country, as well as to the Norwegian Ministry of Foreign Affairs.

3. Organization, Timetable, and Reporting

The Review is based on a one-week visit to the country by the Team (week 10).

The Review Team will be comprised of experts who have a broad background in climate change and environmental issues, experience in climate proofing and mainstreaming of the environment, CDM, familiarity with the Norwegian environmental action plan and natural resources management in general and private sector experience.

The team will submit a final report in English and present a draft report, including a preliminary summary of key findings, conclusions and recommendations, upon departure.

x. February 2009

Royal Norwegian Embassy New Delhi

ANNEX II: PERSONS MET

Organization	Name
Royal Norwegian Embassy in New Delhi	Lasse Bjørn Johannessen Therese M. Wagle Bazard Renu Wadehra Vivek Kumar Loganathan Vijayanathan Anne-Lise Langøy Jan Håkon Olsson Somesh Kumar Rekha Gupta
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Department of Science and Technology	Dr. Bhoop Singh
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