Viet Nam and Climate Change:

A discussion paper on policies for sustainable human development

Ha Noi, December 2009

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List of acronyms

BAT	Best Available Technology
BPT	Best Practical Technology
CCFSC	Central Committee for Flood and Storm Control
CCS	Carbon Capture & Storage
CDM	Clean Development Mechanism (under the KP)
CO_2	Carbon Dioxide
COP15	Fifteenth Conference of Parties to the UNFCCC, Copenhagen, December 2009
DRR	Disaster Risk Reduction
GCM	Global Climate Model (also: Global Circulation Model)
GDP	Gross Domestic Product
GEF	Global Environment Facility (official UNFCCC finance channel)
GHGs	Greenhouse gases
IHMEN	Institute for Hydrology, Meteorology and Environment (MONRE)
IPCC	Inter-governmental Panel on Climate Change
KP	Kyoto Protocol
LDCs	Least Developed Countries
LECZ	Low Elevation Coastal Zones
MARD	Ministry of Agriculture and Rural Development
MDGs	Millennium Development Goals
MOC	Ministry of Construction
MOCST	Ministry of Culture, Sports and Tourism
MOET	Ministry of Education and Training
MOF	Ministry of Finance
MOFA	Ministry of Foreign Affairs
MOH	Ministry of Health
MOIT	Ministry of Industry and Trade
MOLISA	Ministry of Labour, Invalids and Social Affairs
MONRE	Ministry of Natural Resources and Environment
MOST	Ministry of Science and Technology
MOT	Ministry of Transport
MPI	Ministry of Planning and Investment
NAMAs	Nationally Appropriate Mitigation Actions
NGO	Non-governmental Organization
NTP-RCC	National Target Programme to Respond to Climate Change
R&D	Research & Development
REDD	Reduced Emissions from Deforestation and Forest Degradation
SEA	Strategic Environmental Assessment
SEDP	Socio-economic Development Plan (e.g. 2011-2015)
SEDS	Socio-economic Development Strategy (e.g. 2011-2020)
SRI	System for Rice Intensification
SIDS	Small Island Developing State
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
V&A	Vulnerability and Adaptation (assessments)
VASS	Viet Nam Academy for Social Science
VAST	Viet Nam Academy for Science and Technology
VUSTA	Viet Nam Union for Science and Technology Associations

Preface

It is with great pleasure that the United Nations in Viet Nam presents this policy discussion paper on climate change. We hope it will be of use to Vietnamese policymakers, interested citizens, and the international community.

In the past two years much has been said about climate change, around the world and in Viet Nam, and also in dialogues between the Government and the international community. This is not surprising, because in the course of 2007 we all became acutely aware of the risks facing the world, including Viet Nam.

We now also know that major climate action is possible and that it can bring many opportunities for further development of the country, with benefits extending well beyond just averting the dangers of the adverse effects of climate change. This paper argues that in many ways climate change should be taken as a wake up call and the needed responses should be viewed as an opportunity for speeding up human development.

The UN has been very much part of the national dialogues on climate change and we hope that it will continue and that this constructive engagement will deepen even further.

This policy discussion paper is the result of different UN organizations providing their particular expertise and insight on this issue, and as such is an example of the UN family working better together as part of the UN reform process here in Viet Nam.

The analysis and recommendations in this paper have been discussed in depth among heads and staff from many different UN organizations in Viet Nam, who also contributed comments and text. The primary author is the Policy Advisor on Climate Change for UNDP Viet Nam. The UN's Communications Team helped with the final editing and production.

Several Vietnamese officials and researchers alerted us to inaccuracies and provided information, for which we are very grateful. Some UN-contracted experts undertook research and provided inputs, and these contributions are also gratefully acknowledged.

In the coming years the UN will formulate new strategies and plans for our support to Viet Nam, and we will ensure that technical assistance, capacity building and lessons learning on responding to climate change are core parts of our mission.

I highly recommend this paper to you, and encourage your engagement in discussions about the many issues that it raises.

Jesper Morch
United Nations Resident Coordinator a.i.

Executive summary

Climate change is a major threat to sustainable development, but international policy developments and national policies and actions also offer opportunities. This paper aims to identify and analyse the main policy questions that Viet Nam is facing in responding to the effects and the causes of climate change, in order to ensure continued human development.

Climate change effects

Scientific data indicate that Viet Nam is '*particularly vulnerable to the adverse effects of climate change*', as defined in the UN Framework Convention on Climate Change (UNFCCC). Predictions for Viet Nam's regions according to global scenarios of future greenhouse gas emissions, as used by the IPCC, show major effects on the country from climate change including increased climatic extremes as well as less spectacular, but gradually growing climatic stresses on resources and communities.

Increases in *average* temperatures and average changes in rainfall from climate models do not fully illustrate the extent of 'dangerous climate change', which means that climatic events become more extreme. Importantly, because 'avoiding dangerous climate change' is possible but not certain, there is a need to invoke the 'precautionary principle': since climate change effects may be very extreme, even if the scientific data cannot provide certainty anticipatory action must be taken.

Climate change policy

Viet Nam has laws, strategies, plans and programmes that are consistent with the principles of sustainable development, including the National Target Programme to Respond to Climate Change (NTP-RCC). The NTP-RRC provides the basis for action planning in all sectors and localities until 2015, supports research and awareness raising, and helps coordination.

The NTP-RCC should help Viet Nam formulate an overall climate change strategy with long term goals on adaptation as well as greenhouse gas (GHG) emissions mitigation. Viet Nam should consider the risk that sea level rise and the effect of climate change on typhoons, rainfall, drought and temperature could be worse than even the worst case predictions. It should therefore use the precautionary principle in long-term visioning and planning.

Long-term investment plans also need to recognise that though climate change effects cannot be predicted with absolute certainty, they are expected to be more pronounced farther in the future, and according to economic studies, up-front investments in adaptation will pay off. *Despite* climate change effects, it is important that Viet Nam provides even better protection from flooding in the future. While not easy, this befits the ambition of Viet Nam to become a developed nation in the medium term.

Immediate mainstreaming of climate change considerations in public and private sector investment plans is needed, particularly in the energy sector. There is much that can easily and quickly be done to reduce energy use, producing benefits for both industries and society. Investment decisions made today can have a long-term impact on emissions levels.

Strengthening of urban and rural spatial planning and formulation of integrated master plans are also critical for both climate change adaptation and for low carbon economic development. Climate change actions plans (under the NTP-RCC), master plans (e.g. for regions such as the Mekong Delta), and investment plans must reflect socially differentiated analysis of climate change impacts and adaptation actions, and of GHG mitigation actions.

Strong coordination between sectors and effective oversight of policy implementation requires strong supervision by the Prime Minister and support structures that are well financed and have significant numbers of high quality staff. The Standing Office for the NTP-RCC needs further strengthening, and the active participation of MPI and MOF is especially needed due to the expected changes in the nature of ODA for Viet Nam.

To raise public awareness of climate change is an urgent task, as is building the capacity of institutions, especially during the early stages of implementation of the NTP-RCC. This assistance must include mass organisations and provinces that need to rapidly develop their own action plans to respond to climate change.

Climate change vulnerabilities and adaptation

The overall objective of climate change adaptation should be to strengthen the resilience of men, women, children, communities, regions and sectors, and enhance the ability of businesses and governments to deliver services in the face of climate change effects.

People who are vulnerable to climate change effects include those living in the coastal belt (where sea level rise is exacerbating flood risks and saline water intrusion); people living in Viet Nam's river deltas (who are seeing enhanced risks of river floods); communities along the central coast (at risk from more severe typhoons and droughts) and people in mountainous areas (who are subject to increasingly heavy rain, landslides, and droughts). Among the most vulnerable groups are women, children and the elderly. Ethnic minorities, because they are relatively poor, are also very vulnerable to the effects of climate change, as are many migrants. Poorer urban dwellers are vulnerable because they often live and work in low lying neighbourhoods with bad drainage and little access to clean water.

Particularly affected sectors include agriculture and aquaculture (including their infrastructure). National and global food security is at risk since the Mekong Delta is a key source of rice production and exports. Also vulnerable are urban and rural water supply systems, transport infrastructure, and social services such as health and education. Trade and the manufacturing industry are also vulnerable, especially from natural disasters.

The NTP-RCC identifies the need to conduct vulnerability and adaptation (V&A) assessments at sectoral, regional and community levels, and identifies the social groups that are most vulnerable to the impacts of climate change. It does not, however, explain the different roles of men and women in responding to climate change, nor their responsibilities or decision-making powers. These social differences and social relations need to be analysed as an integral part of V&A assessments.

Women, for example, are not well represented in national and local planning and decision-making related to climate change responses. While rural women are particularly active in agriculture many women do not have legal rights to land and therefore cannot always access larger scale credit or retain land in case of divorce or death of husbands, and agricultural extension services are still male dominated. These barriers to women's participation need to be addressed as climate change creates new stresses on resources and livelihoods.

Children must also be included in V&A assessments, as they have demonstrated that they can be good communicators and change agents in disaster risk reduction (DRR) efforts.

In addition, while climatic stresses will greatly affect ethnic minority people in the uplands, they must not be seen only as victims. Their traditional knowledge and practices can hold significant value for developing responses to climate change.

To successfully adapt to climate change, the livelihood opportunities for less affluent men and women working in agriculture, animal husbandry, aquaculture, and forestry must be strengthened. Gendered approaches are needed in DRR efforts, and health and education services must be guaranteed in light of additional climate stresses. Policies should enable women and men to migrate without hindrance, and women must be targeted in support to urban livelihood strategies. This means that household registration should enable rather than hinder migrants' access to local services, including education for their children.

Enhancing resilience of people, geographic areas and sectors through creation of livelihood opportunities for men and women, and protection of lives, livelihoods and property will require both 'soft' and 'hard' measures. 'Soft' measures include efforts like behavioural change initiatives to improve preparation for natural disasters, better information sharing, and agricultural research and development. 'Hard' measures such as infrastructure development will entail major investments in master planning and underlying research.

It is clear that large-scale infrastructure is needed to protect lives, livelihoods and property. Dykes and expanded mangrove forests are needed to protect villages, towns and cities, while storm surge barriers are required to protect cities and harbours. Major reservoirs are necessary to store fresh water. Roads and bridges need to be 'climate proofed' to accommodate increased drainage requirements. The location of industrial parks is critical to their vulnerability to climate change effects, whilst chemical use or production poses a hazard during floods. Urban rail, drainage and wastewater systems must be designed or adjusted for higher rainfall levels and peaks in water discharge. Typhoons require reinforcements of private and public buildings. Access to services during and after disasters must be guaranteed (such as access to hospitals). This can be achieved partially through adjustments to building standards and practices.

In large investment programmes, it is critical to apply participatory, consultative approaches. One important policy being implemented is the relocation of people living on scattered homesteads in the Mekong Delta to raised land, where schools, water supplies and other services are being made accessible year-round. This experience should be critically assessed, adjusted as needed, and scaled up further.

Greenhouse gas emissions mitigation: energy

Viet Nam has a rapidly growing economy that has contributed to significant poverty reduction, though inequality is rising. Looking ahead, Viet Nam is likely to experience rapid growth in consumption and associated GHG emissions, especially in urban centres.

It estimated that Viet Nam's total emissions will more than double during the period 2000-2020, especially emissions from the energy sector. Viet Nam is seeing increased use of fossil fuels in transport, industrial production and electricity generation. This includes coal, which is abundant in Viet Nam. However, there are many inefficiencies in household and public sector energy use, in the transport sector, and in the manufacturing industry. In other words, there is a lot of 'low hanging fruit' in terms of improving energy efficiency in cost-effective ways, according to experts. This can be done through a process of technology transfer, capacity building and investment. There is also substantial potential for expanding the generation of renewable energy, especially wind and solar power.

Planning a low carbon and primarily urban economy now will likely have positive impacts on economic growth, while providing other benefits such as reduced urban pollution; public transport helps improve urban air quality and reduce respiratory diseases. Technology transfer, including the adoption and development of low GHG emissions technologies, can also provide immediate benefits for low income households, including social benefits.

Most technology transfer should take place in the manufacturing industry, which needs benchmarks and predictable revenue streams before major investments can be expected. Businesses need innovative ways to improve energy efficiency, conduct energy audits and implement (newly proposed) energy management standards. They need access to capital, and can be encouraged to adopt new technologies through innovative and well-monitored (voluntary) standards and environmental audits. The Government should regulate, build capacities, and provide some incentives to make this happen.

Land use change and forestry

In the forestry and 'land use change' sector, CO_2 absorption will exceed CO_2 emissions, according to projections. Wetland rice and (increasing) livestock production are contributing significantly to GHG emissions. However, improvements in water management and rice land tilling practices and more efficient use of fertilizer are possible, contributing to reductions in farm costs whilst reducing methane and nitrous oxide emissions. Methane emissions from livestock can be reduced by adjusting animal feed and by producing and capturing biogas from animal waste. Such mitigation actions can have significant co-benefits in terms of food security, poverty reduction, and improved gender equality. This will require substantial public investment in capacity building, institutional development, extension and farm financing so that both women and men farmers can make a transition to sustainable agricultural practices.

Viet Nam has increased its forest cover but biodiversity quality is degrading in some areas and there is increased risk of forest fires as droughts are made worse by climate change. There are opportunities for greater carbon sequestration, which would also enhance biodiversity conservation and poverty reduction through appropriate land-use schemes. Of particular importance are mangrove belts along the coastline, which help protect dykes and play a key role in maintaining marine biodiversity and livelihood resources.

Reduced Emissions from Deforestation and forest Degradation (REDD) may result in (new, additional) financing for forestry conservation and protection under a new agreement of the UNFCCC. Viet Nam is being supported by the international community to prepare for the implementation of new REDD financing mechanisms. Success will depend on the continued full commitment of Viet Nam to build capacities at different levels and ensure that the financial resources benefit those local people who achieve actual emission reductions.

While technological innovation and increased financial flows to sectors such as forestry are important, they can also erode rather than improve the social status of women. It is critical, therefore, that gender analysis is included in strategies for technology development and transfer. Gender analysis is also important when undertaking campaigns to change behaviours that relate to GHG emissions – such as building awareness of the carbon footprint of consumer products.

The Clean Development Mechanism (CDM)

The Clean Development Mechanism (CDM) under the Kyoto Protocol regulates the creation and trading of emissions reduction credits that are an offset against agreed emissions reductions in developed countries, from where revenue comes. The CDM is functioning in Viet Nam but not yet on a large scale. Barriers to full development of the CDM in Viet Nam include a lack of awareness in the business community, a lack of high-risk investment capital, a lack of appreciation among officials of the benefits of CDM projects, and limited capacities. In addition, current regulation requires that all ODA-supported credits under the CDM accrue to the Viet Nam Environment Fund and not to the project owners. It is critical that Viet Nam addresses these barriers and takes full advantage of the CDM.

Many investments in Viet Nam could benefit from the CDM. For example, there is a largely untapped potential for use of methane from waste dumps, mining and other sources that could be used as fuel for electricity generation. Viet Nam has not yet started to explore carbon capture and storage (CCS) technologies, which are expensive, but capacity building related to these important technologies is needed, for example, because the location of power plants built in the near future will determine the potential application of CCS in the long term. The CDM could also ensure the financial feasibility of hydropower investments.

Knowledge and awareness

Viet Nam needs quality data to support policymaking and formulation of action plans and investment plans. The NTP-RCC aims to support this through strengthening of Viet Nam's policy research capacity on climate change challenges. Viet Nam has many research organisations but few high quality researchers focusing on climate change, and financial resources for research are spread thinly. The research base is dispersed and whilst research collaboration is sometimes good, it is limited in many cases. There is an urgent need to increase investments in research and strengthen research collaboration, for example, through the creation of a Viet Nam Panel on Climate Change (VPCC).

There is a real need for knowledge on the social and economic impacts of climate change and the economic opportunities from GHG emissions control. For example, there is a lack of research on how decisions to migrate are made and how migration can increase the resilience of men and women migrants as well as that of relatives staying behind. There is also limited systematic knowledge of the roles and (practical and strategic) needs of women in greenhouse gas emissions mitigation and how these roles could be strengthened.

Furthermore, much relevant national data is still not routinely broken down by age and sex (e.g. data on the impact of natural disasters). Other examples where the knowledge base should be strengthened are cost and benefit projections of climate proofing of infrastructure; renewable energy generation; and energy efficiency in the manufacturing sector. In addition, the use of financial instruments for promoting low carbon innovation should be studied, such as carbon taxes, carbon cap and trade regulations, and/or subsidies.

There has been substantial coverage of the climate change challenges in the national media over the past two years, including programmes aimed at youth, and there is growing awareness of climate change impacts at the local level. However, current public discourse is concentrated on the effects of climate change on natural disasters and agriculture, while climate change effects and impacts on, for example, health are also important. Some climatic stresses do not grab headlines. Furthermore, awareness of opportunities for GHG emissions control needs to be increased amongst state officials and the general public.

Importantly, climate change must be understood as a human development opportunity as well as a challenge. Mainstreaming of climate change in formal and non-formal education, including school and university curricula, teacher training and campaigns focused on children and young men and women, is critical. Awareness raising efforts must lead to behaviour change and action, at both personal and community levels, as well as in the Government and businesses.

Finance and investment

Financial needs for climate change adaptation as well as GHG emissions mitigation are enormous, according to several international analyses. There is a need for formulation of investment plans for climate change proofing of infrastructure. Investments would initially focus on the measures to ensure that schools and health facilities remain accessible during and immediately after climate-related disasters. To protect Viet Nam's deltas and coastal regions from of sea level rise and related saline water intrusion, large investments in research and design are needed, followed by investments on an unprecedented scale.

To limit the impacts of climate change Viet Nam also needs to invest in public and private sector efforts to mitigate GHG emissions. Viet Nam is among the countries that are 'particularly vulnerable to the adverse effects of climate change' which makes it eligible for 'new and additional' financing under the UNFCCC.
These funds would come through public (ODA) channels as well as markets. Since Viet Nam is becoming a middle income country, ODA in the form of grants and concessional loans is falling, though ODA for climate change is set to increase. Thus, ODA to Viet Nam in the future may be focused on climate change and will be important for climate change adaptation, while market financing will be critical for GHG emissions mitigation.

The Global Environment Facility (GEF) is the official financing mechanism of the UNFCCC, and funding of GEF may be increased. Other financing mechanisms include the Adaptation Fund (supported by a CDM levy under the Kyoto Protocol); climate financing windows of the development banks; and new financing windows under the UNFCCC, including REDD. Viet Nam will need substantial capacities to access such funds, requiring concerted efforts to learn about funding options and excellent cooperation between different ministries.

The sectoral and provincial actions plans being developed under the NTP-RCC could become the programmatic basis for setting up a climate change trust fund to receive and manage international funds according to nationally appropriate, harmonized rules, especially monies aimed at capacity building.

The financial and economic crisis that started in 2008 has been addressed with domestic financial stimulus. This policy could prioritize investments in 'climate proofing' of small-scale infrastructure. Investment in energy efficient technology, including in the manufacturing sector, is also possible, and would provide both economic and environmental benefits.

While GHG mitigation should not be a major demand on Viet Nam's domestic public finances, in all likelihood Viet Nam will need to raise substantial investment capital domestically, even with a successful outcome of the international climate negotiations. Capital is needed in particular for large scale investments in adaptation.

Viet Nam should develop financial policy instruments that provide market signals to limit GHG emissions, including carbon taxes, or a domestic carbon cap-and-trade system. These could help raise domestic capital for adaptation investments. Viet Nam should also develop 'index-based' insurance, such as crop insurance schemes based on upstream river water levels which would to transfer flood risks of farmers along the Mekong River to international markets. These policy instruments require strengthening of capacities at many levels.

The Government should also influence the behaviour of businesses through regulation of innovative (voluntary) standards, and enable voluntary carbon trading. Viet Nam has some experience with loan guarantee funds that improve access to capital and reduce investment risks for companies that invest in energy efficiency, low GHG emissions technology, and renewable energy generation. These schemes should be scaled up.

International climate policy

It is important to 'seal the deal' in Copenhagen in December 2009 although only a 'framework agreement' may be reached, with details to be worked out in later meetings. Viet Nam stands to lose a lot if enhanced international cooperation is not agreed upon and implemented quickly. It is in a position to help shape international climate policy that would serve its interests and those of similar countries, and play an active and constructive role in international climate *diplomacy*. Viet Nam should stimulate dialogues, strengthen coalitions, formulate feasible policy positions, and actively search for international compromises.

MONRE and MARD are active and have capacities in this area, but successful climate diplomacy will require more active involvement and strengthening of capacities in many ministries. Success in helping to achieve international agreements also requires strong determination by the Vietnamese leadership, including major investments in human resources (for climate negotiations), capacity building and travel.

By building on its national experience Viet Nam should help ensure that in all agreements the principles of sustainable development are reflected, including (short-term) poverty eradication and protection from climate change effects; economic growth; socially just development including gender equality; and long-term environmental sustainability.

The following negotiation issues are critical for Viet Nam:

GHG emissions mitigation

- The UNFCCC principle of 'common but differentiated responsibilities', means that developed countries are responsible for reducing GHG emissions and for providing financial support to developing countries for climate change adaptation and GHG mitigation.
- Developing countries will undertake 'nationally appropriate mitigation actions' (NAMAs), supported by national financial and human resources as well as ODA. Viet Nam is already undertaking some NAMAs, which helps it in making the case for 'new and additional' international financing for both climate change adaptation and GHG emissions mitigation.
- Viet Nam is not expected to divert funds away from efforts to reduce poverty and improve basic services, but should pursue GHG emissions mitigation actions that also promote socio-economic development. These efforts would receive at least some financial and technical support from developed countries.
- Developed countries' GHG emissions mitigation actions as well as their support to GHG mitigation in developing countries should be 'Measurable, Reportable and Verifiable' (MRV). Viet Nam could also follow the MRV principle for domestic mitigation initiatives, which would help convince other countries that it is playing its part, though what MRV means is not yet agreed upon internationally.

Climate change adaptation

- In Viet Nam large numbers of people will be affected by climate change unless major action is taken. While Viet Nam's capacities are good and Least Developed Countries (LDCs) and Small Island Developing States (SIDSs) are singled out in the UNFCCC as deserving special attention, Viet Nam is clearly a country that is 'particularly vulnerable to the adverse effects of climate change' and 'should be given full consideration' for support to adaptation actions under the UNFCCC.
- The UNFCCC negotiations must result in the establishment of adaptation institutions and commitments to support developing countries in adapting to climate change.

- Viet Nam's climate change adaptation needs include DRR measures; awareness raising; strengthening of social protection systems; improved social services; strengthened social and commercial insurance for climatic stresses; strengthened livelihood support services such as agricultural extension; strengthened R&D; large scale infrastructure investments and 'climate proofing' of other infrastructure; and improved planning of industrialization and urbanization.

Financing and financial institutions

- Without a significant decision on international financing for adaptation, the parties to the UNFCCC are unlikely to reach a successful agreement. Financial *demands* as well as estimates of *needs* may be at least 0.5 percent of developed countries' GDP.
- Viet Nam should indicate the magnitude of its needs based on high quality assessments, which will strengthen its role in the international negotiations.
- It is widely though not universally accepted that the 'new and additional' funding should be mainly public funding. However, there is disagreement over the relative importance and functioning of carbon markets and private sector investment. Developing countries demand that governance of climate change finance reflects 'equitable and balanced representation' of developing countries, as the UNFCCC indicates. Viet Nam should actively engage in negotiations on this issue as it has major financial needs as well as substantial experience with different funding mechanisms.

Capacity building and technology transfer

- Capacity building is needed in the public and private sectors, the research community and in the education sector to effectively implement measures for both climate change adaptation and GHG emissions mitigation.
- Technology transfer plays a key role in the response to climate change, but institutional, financial, legal, and political barriers can be high, including transfers of intellectual property rights to developing country businesses. An agreement to address the barriers to technologies for mitigation and adaptation has not been reached yet and it is critical that Viet Nam engages in these negotiations, especially because of its need for renewable and low emissions energy and modernisation of key industries.
- Establishment under the COP of a Subsidiary Body on Technology could help with the planning, organizing, coordinating, monitoring and evaluation of international technology development and transfer to developing countries. A climate technology fund (or window within a general climate fund) under supervision of the COP has also been proposed. A proposal to set up (regional) centres of excellence to ensure international cooperation on R&D and information sharing is broadly supported.

REDD

- Viet Nam has a strong interest in supporting a broad scope for REDD and in guarantees that international financing benefits local (ethnic minority) people and forest managers in upland areas and the coastal (mangrove) strips.
- Capacity building is also critical so that Viet Nam can take voluntary, domestic actions to reduce emissions. Viet Nam has set up a project under the UN-REDD programme, and could share experiences with other countries on how public funds that are 'new and additional' to existing ODA can be used to support multiple development goals – and thus play a central role in REDD negotiations.

Conclusion

Viet Nam has major needs if it is to effectively respond to the challenge of climate change. At this stage the country has the NTP-RCC, considerable institutional and human capacities and has started to take action, with some international support. However, it needs much more international assistance, and will need to access financial and other international support for which it is eligible under the UNFCCC. This support is gradually coming into place to ensure that climate change effects have limited impacts on the lives and livelihoods of the Vietnamese people, and to ensure that opportunities are created for technological advancement and employment in low emissions production and consumption.

Climate change is a wake-up call, and requires scaling up of good development practices. Viet Nam's development ambitions should remain high, despite the challenges of climate change. Most adaptation solutions exist or can be easily developed, and many GHG emissions mitigation solutions exist, or are being developed. Although it is conditional on very substantial international support, climate change action can thus become an opportunity for achieving sustainable human development goals.

The UN is committed to supporting Viet Nam in setting an example of an inclusive approach to development within which climate change is mainstreamed, an approach in which both the effects and causes of climate change are fully addressed.

I. Introduction

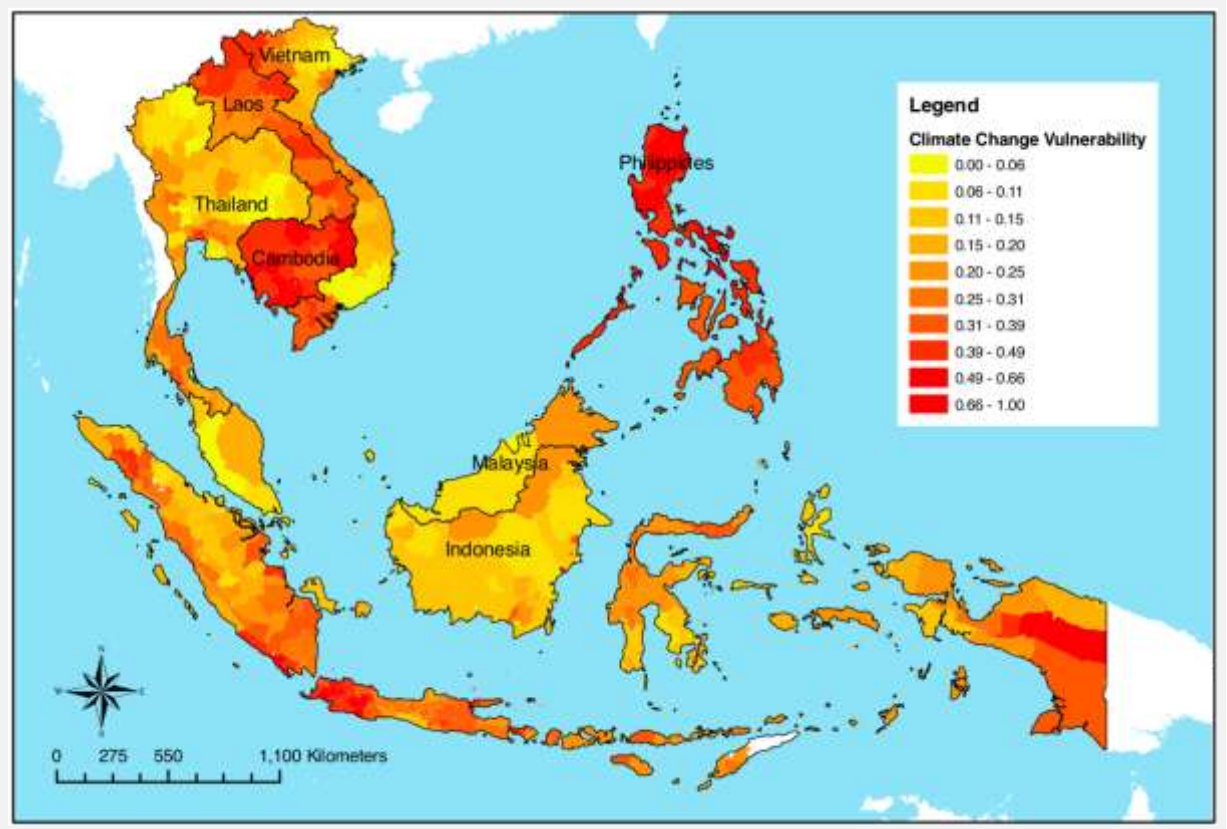
1. With the Fourth Assessment by the Inter-governmental Panel on Climate Change (IPCC) in 2007[1] it has become clear that: (i) climate change is this century's main threat to sustainable development; and (ii) it is caused by humans. International summits are now dominated by climate change, in particular in the run up to the 15th Conference of Parties (COP15) to the UN Framework Convention on Climate Change (UNFCCC) in Copenhagen in December 2009. Ban Ki-moon, the Secretary-General of the United Nations, described climate change as '*the greatest collective challenge we face as a human family*'. He also said that in Copenhagen, '*we have a chance to put in place a climate change agreement that all nations can embrace, which will be equitable, balanced, comprehensible'.*[2] Viet Nam has responded to this global and national urgency through its National Target Programme to Respond to Climate Change (NTP-RCC), which was approved in late 2008. The NTP-RCC provides the basis for analysis and action planning in all sectors and localities of Viet Nam, especially until 2015.
2. This paper aims **to identify and analyse the main policy questions that Viet Nam is facing in responding to the causes and the effects of climate change, in order to ensure continued human development**. A range of recommendations is offered for consideration and further discussion by national authorities, non-governmental organizations (NGOs), businesses and international partners as Viet Nam comes to terms with the magnitude of the climate change challenges and plays an increasingly active role in the international climate negotiations. Many of these recommendations concern policy actions on which the UN and others in the international community are collaborating or starting to collaborate – with the Government, local authorities, NGOs and/or the business community (see also Annex 1).

II. Sustainable development and climate change

3. Scientific data on global climate change and model studies show that **Viet Nam** is one of the countries **particularly affected** by the adverse effects of climate change. Examples include increased risks of floods and droughts, sea level rise and saline water intrusion, and increased health risks from heat waves, dengue fever and malaria.[3] The risks are already felt in the coastal lowlands and the uplands, in rural areas and in urban areas – but in different ways.

Relative vulnerability of coastal deltas as shown by the indicative population potentially displaced by current sea-level trends to 2050
(Extreme = >1 million; High = 1 million to 50,000; Medium = 50,000 to 5,000)[4]

4. Sea level rise and saline water intrusion are examples of climate change-enhanced stresses that will cause **displacement**. The figure above from the IPCC (2007) suggests that the **Mekong Delta in Viet Nam and Cambodia is one of three global hotspots** in this regard.
5. Climate change increases **vulnerabilities** of women, men and children, communities, businesses, and economic sectors and regions. It obstructs social and economic development, though various types of infrastructure and services, and capacities of the public sector, businesses and local people can help Viet Nam cope with climate change effects. In some cases response measures can be turned into opportunities for social and economic development. Therefore, investment in increasing the capacity to deal with the stresses of climate change (i.e. resilience) among women, men, children, communities, public services and businesses will pay short and long-term social and economic dividends. In fact, research in many countries suggests that investment in the years and decades to come to avert the main short and long-term costs of climate change is a social imperative, economically wise, and globally feasible.[5]
6. Vulnerability can be captured in **indexes** based on quantifiable indicators of climate change stresses and a country's capacities, which is especially useful for comparative purposes. The figure below shows that Viet Nam is particularly affected by multiple adverse effects of climate change such as sea level rise, increased floods and droughts as well as typhoons. However, while the Mekong Delta, for example, is one of the most affected regions of the world, Viet Nam's comparative capacities make it somewhat less vulnerable than Laos and Cambodia.



Vulnerability to adverse effects of climate change in the Southeast Asia region[6]
Note: This index includes different climate change effects (e.g. floods, droughts, typhoons and sea level rise) and comparative capacities to deal with these stresses

7. Average global warming and climate change are the result of the 'greenhouse effect', which is caused by humans. This is especially due to the use of fossil fuels in ever increasing quantities, and deforestation. The build-up of atmospheric GHGs has been, and continues to be, caused by industrialised nations in particular. However, developing countries such as Viet Nam are increasingly contributing to GHG emissions. In this context, responding to the causes of climate change also offers opportunities, especially if modern energy production and manufacturing technologies are transferred to developing countries so that they make rapid progress towards a '**low carbon economy**'[7] (without affecting expenditures on poverty reduction, social development and the pace of economic growth).
8. **Sustainable development** was famously defined as '*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*' – adding a long-term outlook to typically short-term development policies.[8] Much current Vietnamese law and policy is consistent with the principles of sustainable development. Viet Nam has many laws, strategies, plans and programmes in place that relate to climate change, including the Law on Environmental Protection (2005), the Energy Law (2005), the Law on Forest Protection and Development (2005), the Law on Water Resources, and the Law on Biodiversity (2008). The country has a general Socio-Economic Development Strategy (SEDS 2001-2010), and sector strategies, action plans and programmes on environmental protection, afforestation, and water resource management, coastal development, poverty reduction, management of natural disasters, energy efficiency, cleaner production, etc. It also has a national Agenda21, the *Strategic Orientation for Sustainable Development in Viet Nam*, which was approved in 2004. The core principles of the Viet Nam Agenda21 have been adopted in the national Socio-

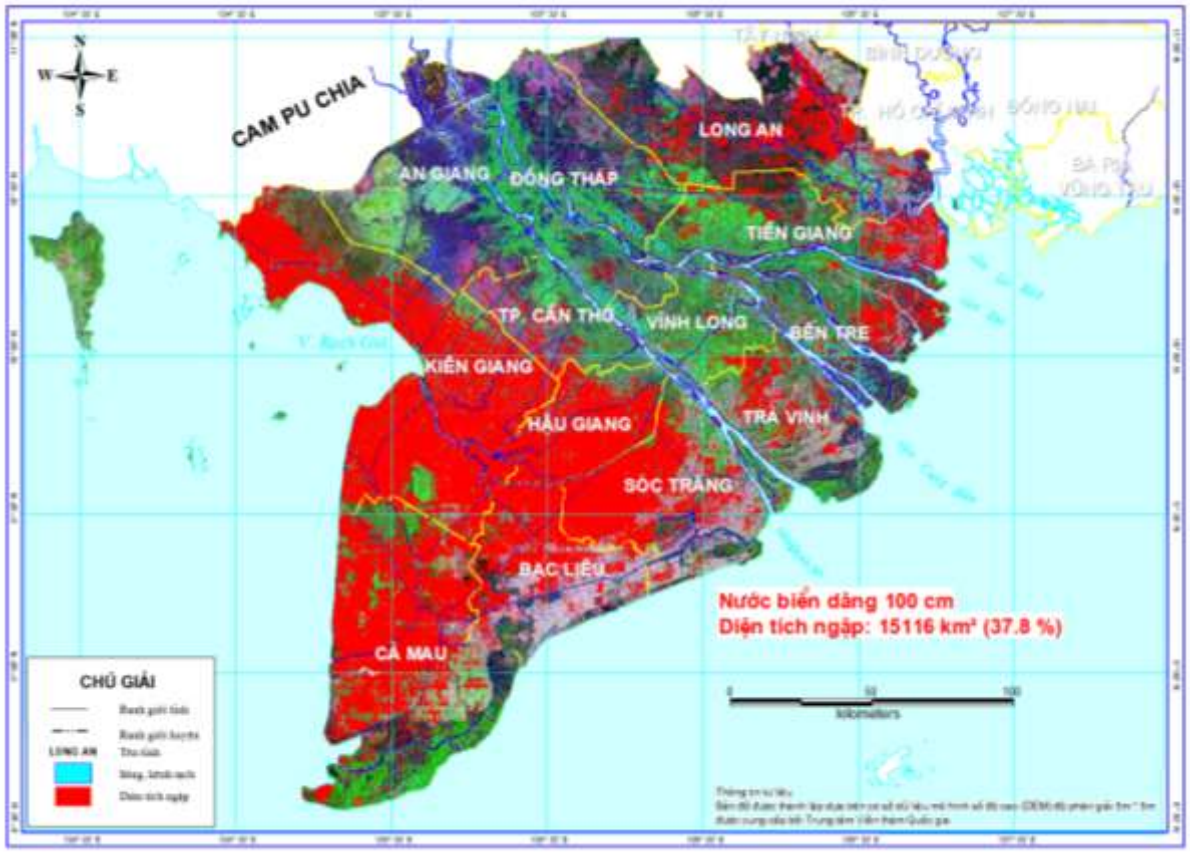
Economic Development Plan (SEDP 2006–2010), including in the three pillars of economic growth, social development and environmental protection.

9. The **combination of short and long-term outlooks** we find in the definition of sustainable development is pertinent because climate change is happening already and is set to continue for decades and centuries to come, even if global action taken to mitigate the causes turns out to be strong.[9] There is little mention of climate change in the policies listed above, even though climate change responses are critical to achieving sustainable development. Nevertheless, Viet Nam has engaged with the international climate change processes and started to develop policies on both the causes and the effects of climate change. Viet Nam ratified the UNFCCC in 1994 and the Kyoto Protocol in 2002. It has submitted its Initial Communication to the UNFCCC[10] and is working on its Second Communication, with UN support.[11] Most importantly, Viet Nam has swiftly formulated and approved the above mentioned NTP-RCC.

10. Viet Nam has capacities to respond to climate change due to a strong agricultural sector and a long tradition in dealing with natural disasters, among other reasons. Its capacities, though lower than those in the industrialized countries, are considerably higher than those of most of the LDCs. The NTP-RCC and some stand-alone but related projects and programmes are receiving financial and technical support from the UN, multilateral funds,[12] bilateral donors, and NGOs to strengthen capacities to respond to climate change. This means that support is gradually coming into place to ensure that **climate change effects** (of which Viet Nam experiences more than most countries) have limited **impacts** on lives and livelihoods of the Vietnamese. This support will also help ensure that investment in climate change responses creates opportunities for technological advancement and employment in **low emissions** production and consumption, and has other social, economic, and environmental benefits.

III. Climate change effects in Viet Nam

11. Vietnamese scientists have applied '**global climate models'** (GCMs) for **Viet Nam's regions** according to three of the global scenarios of socio-economic development and related greenhouse gas emissions for the long-term future, as used by the IPCC (2007).[13] The Ministry of Natural Resources and Environment (MONRE) has reported on how the average climate and sea water levels are likely to change by the years 2050 and 2100 in different parts of the country. They stress the uncertainties in the projections and take a cautious approach in choosing the most likely climate change scenario and its effects.[14] The approach is cautious as it is based on a 'medium global emissions' scenario which assumes that the world will limit GHG emissions and avoid 'dangerous climate change'. The medium emissions scenario is possible with a successful outcome of the international climate negotiations and subsequently major actions on global GHG emissions reduction. However, recently observed changes in emissions, average temperatures and sea level rise, for example, suggest that the world is currently on a high emissions and dangerous climate change path. In short, climate change effects are likely to be worse than estimated by the IPCC in 2007, not better. The Vietnamese climate change predictions will be updated over the coming years, with further global analysis and national data collection and application of models, as per the decision in the NTP-RCC.



Mekong Delta provinces with land affected by a 1 m sea level rise, according to high emissions scenario A2[15]

12. Climate change will make annual total **rainfall** higher everywhere in Viet Nam, by an estimated average for the country of 5 percent over the course of the 21st century, according to a medium emissions scenario, and rainfall will become more variable.[16] The average rainfall is already decreasing in the dryer months (December to May), especially in the Mekong Delta, the Central Highlands and the South-Central Coast regions, and increasing in the wetter months (June to November), especially in the northern regions (see also Annex 2 for some reproductions of the official Vietnamese projections). The entire Mekong River basin wet season rainfall is increasing, meaning that peak water discharge is also going up, and floods such as those in 2000 and 2001 could be repeated unless mitigation measures are taken.[17] **Floods and droughts** are becoming more likely, which will affect agriculture, water supplies and hydro-electricity generation, as well as trade and industrial production in urban areas. Floods and droughts especially affect the poorest women and men who have the least resilience to deal with climatic stresses. These stresses are felt in particular in rural areas, and provide additional incentives to migrate.

13. Viet Nam is one of the most at-risk countries for **sea level rise** and increased **saline water intrusion**, in terms of total land area, numbers of people affected, projected GDP loss and impact on agriculture,[18] for example. Mean sea level rise is impacting many economic sectors, especially in the Mekong Delta (as illustrated above), Ho Chi Minh City, and parts of the Red River Delta, as well as a significant part of the central coast. The average global **sea level rise** will be up to 0.59 m by 2100, according to the highest greenhouse gas emissions scenario used in the Fourth Assessment of the Intergovernmental Panel on Climate Change (IPCC, 2007).[19] The official Vietnamese seawater level rise predictions are higher than this worst-case scenario of the IPCC because the Vietnamese have taken into account some melting of land ice based on scientific data published after the IPCC report of 2007. MONRE's estimate according to a medium global greenhouse gas emissions scenario is that sea level rise along the Vietnamese coast would be on average 75 cm by 2100.[20] Viet Nam's NTP-RCC provides the estimate of a one meter mean sea level rise by the year 2100, which is consistent with MONRE's calculations for a high emissions scenario.[21]

14. The IPCC (2007) projections consider thermal expansion of seawater as the main cause of sea level rise, which is different for different parts of the world. They exclude the effects of the melting and collapsing into the seas of land ice from Greenland, Antarctica and other places. Recent research suggests that there is a serious possibility that this melting may cause a 1-1.5 meter sea level rise by 2100, or possibly more, and an estimated 4-6 meter rise in future centuries. The 1 meter sea level rise by 2100 in Viet Nam's NTP-RCC is thus a reasonable estimate for 'action planning' by sector ministries and provinces under the NTP-RCC. This amount of sea level rise by the year 2100 would inundate a total of 30,945 km^2 land around the country, without measures such as strengthening of dykes and drainage systems. This is 9.3 percent of Viet Nam's land surface and is similar to the total land area of Belgium.[22] The inundation threat is greatest in the Mekong Delta, but is also significant for the Dong Nai River Delta including Ho Chi Minh City, the Red River Delta and along all coastal areas. In Viet Nam's coastal belt live many **poor rural people, and women, children and the elderly are especially vulnerable to flooding**. But cities and industrial parks are also affected, and **poorer urban dwellers** generally live in neighbourhoods with low quality drainage and flood protection infrastructure. Viet Nam ranks sixth in the world among countries with the highest proportion of the population living in Low Elevation Coastal Zones (LECZ).[23] Flooding and other climate change effects are additional stress factors on lives and livelihoods that may push vulnerable people to migrate temporarily or permanently, in search of a safer and stable life.

15. Climate change will lead to increasing sea surface temperatures at higher latitudes of the Pacific Ocean and will lead to more **typhoons** in the northwest Pacific Ocean. The typhoon intensity will also be stronger, especially in 'El Niño' years, and there are clear

indications that since mid-2009 such a period is developing.[24] Typhoons are historically expected in August in the north of Viet Nam, in October in the centre and in November in the South. However, in recent years the typhoon season is occurring later and landfall has moved southwards, and typhoon intensity appears to have increased. These changes imply increased risks for coastal populations, especially from storm surges, whilst after landfall heavy rainfall from typhoons causes major landslides in the uplands. This calls for further strengthening of DRR capacities and measures at all levels, including both coastal and upland regions.

16. Compared to 1990, the **average temperature** is expected to increase by nearly 2°C in the southern regions of Viet Nam and up to 2.8°C in the northern regions by 2100, according to the medium emissions scenario. However, in the high emissions scenario this could be as much as 3.6°C in the North Central Coast region.[25] The minimum temperatures will increase and the number of days with temperatures higher than 25°C will increase. Heat waves are expected to increase too, which affect elderly people in particular. Higher temperatures are expected to increase the spread of vectors of **human diseases** such as dengue fever and malaria. Temperature increase and changes in rainfall and drought patterns may enhance the spread of **crop pests and diseases**, and affect **ecosystems** and farming seasons. Warmer seawater affects several marine ecosystems negatively.
17. Climate change effects include **increased major climatic extremes** as well as less spectacular, but **gradually growing climatic stresses** on resources and communities. Models provide *average* temperatures and rainfall, for certain months and/or quarters of the year over decades to come, and whilst they imply further extremes of rain and drought, for example, the averages do not fully illustrate the extent of '**dangerous climate change**'. The fluctuations year on year and the occurrence and frequency of extremes within years and seasons – i.e. climatic events further away from the trend and the average – are difficult to ascertain with any precision. The models cannot show all the increased 'climate variability' and associated risks, but various data have brought the IPCC to the conclusion that with more than 2°C average global warming the variability will increase strongly. There is however no guarantee that the world will be set on a **low emissions pathway** that would make it possible to limit global warming to 2°C. Furthermore, even if this widely accepted long term target were achieved, 'avoiding dangerous climate change' is then possible but not certain. Whilst Viet Nam has chosen a medium emissions pathway with somewhat higher global warming as the most realistic of all scenarios, there is a need to invoke the '**precautionary principle**' when formulating, planning and designing parameters in response to climate change. This means that anticipatory action must be taken because climate change effects may be very extreme, even if the scientific data cannot provide certainty of that.[26]

IV. Vulnerabilities to climate change

18. Climate change effects in Viet Nam include major climatic hazards as well as more gradual changes in climate variables such as temperature and rainfall. As a result, climate change causes different degrees of additional stress on lives and livelihoods. **Vulnerability** to climate change is defined here as '*the degree to which a person, household, social group, business, organisation, locality or a sector is unable to cope with, resist or recover from adverse effects of shocks and stresses, including climate variability and climate extremes that are enhanced by climate change'*.[27] Different social groups, sectors, etc., are more or less vulnerable to specific stresses and shocks. For example, elderly people are particularly vulnerable to heat waves, and agriculture is especially vulnerable to drought and cold spells. **Resilience** in the face of severe climatic shocks (major hazards) and stresses (i.e. gradually increasing or 'slow onset' hazards) is the *capacity to recover* at the individual and social or collective level, but without assuming a return to the 'original state'. The **overall objective of climate change adaptation** is suggested as strengthening the resilience of men, women and children, communities, regions and sectors, as well as of businesses and governments' ability to deliver services.[28]

The bridge linking Dak Tram commune and other communes (Kon Tum Province) was destroyed by Typhoon Ketsana (2009)[29]

19. There is a need for all kinds of **vulnerability and adaptation (V&A) assessments**. These assessments are full of uncertainties because of the many assumptions about future socio-economic development (whilst the effects of climate change are comparatively well known). However, these assessments are necessary because inaction in the face of certain climate change effects is not acceptable (even though the scale and nature of climate change effects is much less certain). Several vulnerabilities to specific climate shocks and stresses are already apparent, especially among women, children and the elderly, and more generally the poorest, which includes a disproportionate number of ethnic minority people. V&A assessments must continue for many years to come as part of a long-term process of learning and investing. In other words, plans and adaptive actions will need to be continuously revised and adjusted in the medium and long-term future.

The majority of deaths during the Mekong River floods of 2000 and 2001 were children.

Instead of leaving children at home, some mothers take children to childcare centres where children can play and sleep in safety. More of these were created in 2001, and most were set up by volunteers of the Women's Union.

Children in the Mekong River floods of 2000 and 2001[30]

20. **Children** are affected disproportionately by climate change-enhanced disasters and also by lesser climate change stresses. There are direct and indirect impacts on their food security from stresses on families' livelihoods, education, health, and mortality. This calls for targeted adaptive action, for example by ensuring that schools are 'disaster proof', meaning that they will be able to function even in times of floods and are not damaged easily by typhoons or other climatic events. There is much experience showing that children are both good communicators and change agents in DRR (DRR). The UN in Viet Nam, along with several partners, also has experience in consulting with youth on their future in light of climatic changes, and the measures that would need to be taken in the short and medium term in order to safeguard that future.[31] This experience revealed the richness and importance of their ideas, and consultation with boys and girls in V&A assessments may indeed be standardised. Children also offered many suggestions for awareness raising and GHG emissions mitigation, including technological and economic solutions such as 'trees for water', application of renewable energy, etc. However, the consultations so far also suggested that, especially in the more remote rural areas, girls lag behind boys in educational achievements for several reasons, and need targeted support in order to ensure that they have equal opportunities for living in a future where climate change will be a fact of life.
21. Rural **women** have key 'reproductive' roles, such as provision of water, many of which are under increasing stress from climate change effects. Women are particularly active in agriculture, especially when men migrate (this is mostly seasonal) or take up local, non-farm jobs. However, women take over such male responsibilities without equal access to resources (e.g. land and larger scale credit), and agricultural extension services are still male dominated. Women who migrate to towns and cities (seasonally or permanently) often earn less than men, but retain responsibility for reproductive work. In cases of natural disasters women are especially susceptible to water-borne diseases. Women have capacities and key roles in local-level climate change adaptation and disaster management, but not equal status, and they usually have less say in household and community decisions related to these issues. Women are not well represented in national and local planning and decision-making related to climate change responses, except on issues directly related to their roles, such as child care. This impacts on the nation's ability to plan for and address the needs and interests of both women and men. It also limits the opportunity to tap into women's capacity and experience for both adaptation and greenhouse gas emissions mitigation at the local level.[32]
22. Climatic stresses will be felt strongly by the poorest, including many **ethnic minority people** in the uplands, where drought, landslides associated with heavy rains, and temperature changes are already being felt. Ethnic minorities often reside in remote areas whilst their comparative poverty and limited access to markets and services adds to their vulnerability. Stresses on food security and income for people with comparatively low resilience will mean further challenges in achieving the human development targets set by the Government and the globally agreed Millennium Development Goals (MDGs). It also means that indigenous knowledge and cultural diversity are being threatened. Ethnic minorities, however vulnerable, must not be seen only as victims; their traditional knowledge, practices and representations of the natural environment can hold significant value for developing adequate responses to climate change. Priorities articulated by ethnic minority women and men, in the context of climate change stresses, are nevertheless mainly about addressing the 'development gap', i.e. basic needs that also existed before the realisation of the importance of climate change but which must be addressed with even greater urgency as a result of it.

Ha Noi 31 October 2008: unseasonal and extremely heavy rain caused flooding everywhere, as seen in this photo from the UN offices[33]

23. Particularly **vulnerable sectors** are agriculture and fisheries, as comparatively large numbers of poor and near-poor households make their living from these sectors. Other vulnerable sectors include (coastal) tourism and the manufacturing industry in lowland areas. The risk that floods and storm surges will disperse pollutants from industries producing and using chemicals, or from unprotected waste landfill sites is especially high. **Urban areas** are especially vulnerable from flooding. This includes Ho Chi Minh City and all of Viet Nam's major coastal and low lying cities and towns, including those in the Mekong Delta (Can Tho, Long Xuyen, etc.), cities along the coast (Hue, for example, experienced heavy flooding in 2009 associated with Typhoon Ketsana) and also cities affected by extreme local rainfall (e.g. Ha Noi suffered unseasonal and extreme rains in late 2008 that completely overwhelmed its drainage systems). Within these cities and towns the poorer neighbourhoods and families are generally most affected by bad drainage and access to clean water in times of flooding, while income security may be jeopardized by loss of working days. Rural and urban climate change vulnerability is exacerbated by the fact that the overall population continues to grow (reaching 85.8 million in April 2009) and the urban centres especially are growing rapidly, both in population size and density.

24. Climate change poses a serious threat to the conservation of Viet Nam's **natural and cultural heritage**. The threat of increased flooding, irregular seasonal climatic conditions, sea level rise and more and stronger typhoons, as well as warming of the sea water, are direct threats to biodiversity and ecosystems. These same threats can directly impact property, including both ancient and modern physical structures. Archaeological sites risk degradation given the increasing soil temperature, changes in humidity levels and rainfall intensity. They were designed and constructed using local materials for a specific local climate and changes in weather patterns may jeopardize these sites. Furthermore, effects on social structures and habitats could lead to migration and changes in cultural groups, thereby threatening intangible cultural heritage.

V. Greenhouse gas emissions

25. Viet Nam has a rapidly growing economy that has contributed to poverty reduction and increased well-being for most Vietnamese, although growth is affected by the current global financial crisis, and there are some domestic structural economic weaknesses and rising poverty gaps. The population of Viet Nam continues to grow whilst consumption per capita is also increasing rapidly along with economic growth. The 2009 census estimates a total population of 85.8 million. Currently, the ratio of working-age people to dependents is high, and it is estimated that this situation will last for the next 30 years and then level off. Viet Nam is therefore likely to **experience rapid consumption growth and associated GHG emissions growth** in the coming years and decades. Furthermore, it is estimated that most of the population growth will be in urban centres, leading to city expansion and increased urban population density. Therefore, planning and investing in a low carbon and primarily urban economy now is likely to have major impacts on the 'carbon intensity' of the economy in the medium to long term.

26. Environmental resources are under threat, and pollution in cities and rivers is rapidly growing. Viet Nam has not contributed significantly to the historical build-up of atmospheric GHGs that are causing global climate change, and per capita emissions are not yet comparable to those of rich countries. However, Viet Nam is now adding to the cause of global climate change with steadily increasing emissions. It estimated that Viet Nam's **total emissions will more than double** over the period 2000-2020, especially emissions from the energy sector (due to energy consumption and power production, as illustrated below). By 2010, the energy sector will replace agriculture as the highest CO_2 emissions sector. It was projected that after 2005 in the forestry and 'land use change' sector[34], CO_2 absorption would exceed CO_2 emissions. However, the sequestration of carbon in the forestry and land use sector, as summarized below, may have been too optimistic.

Estimated GHG emissions 1994 and 2000, with projections to 2030

Unit: million tons CO_2 equivalent

Year / Sector	1994	2000	2010	2020	2030
Energy	25.64	52.77	135.95	275.33	480.61
Forestry and land use change	19.38	15.1	*-9.66*	*-20.1*	*-27.88*
Agriculture	52.45	65.09	51.86	55.98	59.64
Total	**97.47**	**132.96**	**178.15**	**311.21**	**512.37**

Source: ALGAS, 1997; MONRE, 2000. These data do not include emissions from industrial processes and waste, which were about 6.2% of total emissions (6.4 million tons) in 1994.[35]

27. GHG emissions are increasing, especially as a result of increasing **use of fossil fuels** in transport, industrial production and electricity generation. Energy demand is rising very fast – and much of the energy produced is generated with fossil fuels, including coal, which is abundantly available in Viet Nam. Consumers and businesses and public institutions are purchasing energy-intensive appliances and production equipment. This is illustrated in the power production and energy use table below.

Estimated GHG emissions for power generation and energy use

Unit: million tons CO_2 equivalent

Year / Sector	2000	2005	2010	2020	2030
1. Power Generation	**10.459**	**27.836**	**27.984**	**100.134**	**293.648**
2. Energy Use	**37.233**	**61.821**	**81.167**	**139.813**	**232.235**
Industry	14.049	23.980	31.340	52.992	76.544
Transportation	11.601	21.760	28.123	48.352	85.525
Agriculture	1.127	1.782	2.066	2.444	2.901
Domestic use	7.193	10.145	13.994	25.313	49.373
Trade & Services	3.263	4.154	5.644	10.712	17.893
Total (1+2)	**47.692**	**89.657**	**109.151**	**239.947**	**525.883**

Source: Vietnam Atomic Energy Commission

Note: The totals in this table are different from the 'energy sector' entries in the table '*Estimated GHG emissions to 2020…*' because they include energy use in the agriculture sector, and other minor differences in calculation.

28. There are also many **inefficiencies** in household and public sector **energy use** (e.g. low quality insulation in houses and offices), and in the manufacturing industry (e.g. many state-owned and small-scale private industries use outdated and energy inefficient technology, with some using twice or three times as much energy than others to produce the same amount of product). There is much 'low hanging fruit' in terms of improving energy efficiency in cost-effective ways, according to experts. This can be done through a process of technology transfer, capacity building and investment in stages over the next five years and beyond. This would be done by applying best practical technology (BPT) immediately (which is cost effective, widely available, and possible with limited external support), then by applying best available technology (BAT, which will take more external support), and then the development and use of completely new technology (which will require substantial capacity building and possibly licensing). One of the sub-sectors where much can be gained using this process is the cement industry. There is also substantial potential for expanding the generation of **renewable energy**, especially wind and solar energy.

29. **Agriculture** is a major source of GHGs, contributing 14 percent of global emissions. When combined with related land-use changes, including deforestation (for which agriculture is a major driver), this share totals about one-third of all GHG emissions. In Viet Nam, wetland rice and increasing livestock production are contributing significantly to GHG production. There is a preference for pigs and poultry in Viet Nam, which are more efficient and produce much less methane than, for example, cattle (methane is a very powerful GHG). Nevertheless, food production of all kinds is going up to meet the increased demands associated with a growing population and increasing wealth. The acreage of rice cultivation is shrinking in many localities to make way for industrial and urban expansion, and in order to reduce risks associated with floods and droughts some farmers have reduced their cropping intensity from three to two crops annually. This reduction in cultivated land decreases the potential production of GHG from rice fields, but in order to ensure food supply, an increase in agricultural intensity and productivity is also occurring. Agricultural intensification usually means more use of fertilizers, and the production, distribution and use of fertilizers releases nitrous oxide (N_2O), which is a GHG. However, improvements in water management and rice land tilling practices and more efficient use of fertilizers are possible, contributing to reductions in farm costs whilst reducing methane

and nitrous oxide emissions. Methane emissions from livestock can be reduced by adjusting animal feed and by producing and capturing biogas from animal waste, and the energy produced is renewable and reduces the need for fossil fuels. Some of these practices are already being applied on a small scale in Viet Nam.

Agriculture, including wetland rice and livestock production, is a major source of greenhouse gases[36]

30. Viet Nam has increased its **forest cover** from 27.2 percent in 1990 to 38.2 percent in 2007 through its reforestation programme. Despite this increase, biodiversity quality is degrading in parts of the country, and there is increased risk of forest fire as drought is enhanced by climate change. In other words, carbon sequestration is not happening at the scale possible and risks of reversals are increasing. There are opportunities for greater carbon sequestration through appropriate land-use schemes which also meet other objectives, e.g. biodiversity conservation and poverty reduction. Of particular importance are mangrove belts along the coastline in the north, central and south, which serve many purposes, including ecological functions with special importance for fisheries, carbon sequestration, and protection from the impact of storm surges.
31. **Other sources of GHGs** include methane production from landfills and waste dumps, and from mining. These emissions are only partially being mitigated, so there is a largely untapped potential for use of methane (e.g. as fuel for electricity generation, which produces CO_2, a gas with a much lower greenhouse effect). Viet Nam has not yet started to explore technologies to capture and store CO_2 as carbon capture and storage (CCS) technologies are expensive. However, some research and capacity building activities on this have been initiated.[37] This is important because, for example, the location of power plants built in the near future determine to a large extent the potential application of CCS

techniques in the medium to long term, when appropriate technology and financing would become available.

32. Carbon emissions are not yet generally **monitored** in sufficient detail or reported by all functional sub-sectors – such as by 'road transport', 'steel production', or 'livestock production' sub-sectors – which would enable formulation of targeted policies for increasing efficiencies. Initiatives in this regard are being undertaken by MONRE with several sector ministries in the context of the Second Communication to the UNFCCC, which is also supported by the UN. However, implementation of international best practice in monitoring and reporting will require substantial additional capacity building, with international support.

VI. National policy and institutions

33. International and national climate change policy can be broadly divided into two groups: (a) adaptation to climate change effects; and (b) mitigation of GHG emissions. Viet Nam has set up national structures required under the UNFCCC and the Kyoto Protocol, and related regulation. It has adhered to its commitments to report to the UNFCCC, notably with the Initial Communication, which addresses both GHG emissions and adaptation.[38] This international engagement has also helped build national capacities. Following increased awareness of the climate change challenges both internationally and nationally, Viet Nam formulated an excellent **national programme, the NTP-RCC,** with activities focused on the period **2009-2015**, which the Prime Minister approved in December 2008.[39] It comprehensively addresses climate change effects, impacts and adaptation, specifically with regards to sea level rise, as well as GHG emissions mitigation. It touches on most sectors and will help address many challenges, and is a means to ensure **inter-ministry communication and collaboration.** This last task is supported by a steering committee chaired by the Prime Minister and an Executive Board, both with membership from several ministries.

34. The NTP-RCC aims to **mainstream climate change** concerns into the new Socio-economic Development Strategy (SEDS 2011-2020) and Socio-economic Development Plan (SEDP 2011-2015), and into policies on DRR, coastal zone management, and energy supply and use.[40] **Action plans** to deal with climate change will be developed under the NTP-RCC in most sectors and all provinces, in several stages. This will include **research** and planning in the short term, and formulation and implementation of investment plans at later stages, requiring substantial technical assistance. Importantly, the NTP-RCC should help **Viet Nam formulate an overall climate change strategy** that includes long term goals on adaptation as well as GHG emissions mitigation. Also important but not covered explicitly under the NTP-RCC is climate change mainstreaming in public and private sector **investment plans**. This would include, for example, adapting coastal protection infrastructure and 'greening' energy production and manufacturing.

35. This mainstreaming of climate change effects and GHG emissions mitigation in **investments** is important in the short term because there is so much '**low hanging fruit**' in areas like energy conservation, and because of the many possibilities for co-benefits. Many investments are also worthwhile independent of the exact effects of climate change. For example, further strengthening of disaster management, agricultural research and extension, and supporting rural livelihoods while maintaining high rates of poverty reduction are important.[41] Climate change mainstreaming in investments should also be '**anticipatory'**, meaning long term investment plans need to recognise climate change now even if its effects are more pronounced later. Infrastructure, for example, has a 'lifetime' of decades, including electricity generating plants, manufacturing facilities and sites, and protective dykes. Some of this mainstreaming work has already started. For example, the fact that Ho Chi Minh City is low-lying and vulnerable to sea level rise and other climate change effects is being considered in current planning for new and reinforced dykes and drainage systems. What is not yet always considered, however, is the need, for Viet Nam to provide even better protection from flooding in the future *despite* climate change effects. This befits the ambition of Viet Nam to become a developed nation in say 2050, and raises the stakes considerably.

36. The enormous scale of 'climate proofing' of existing and 'regular' infrastructure investment – as well as additional infrastructure that is needed because of the effects of climate change that can be anticipated in Ho Chi Minh City, the Mekong Delta and elsewhere in Viet Nam – and the analytical work that is required to do this, calls for major partnerships to build capacity in many localities. **Strengthening** of both urban and rural **spatial**

planning capacities and processes and formulation of large scale, detailed **integrated master plans** are particularly important in light of both climate change effects and the need to create conditions for low carbon economic development (notably for the Mekong Delta, greater Ho Chi Minh City, and the Red River Delta).

37. On first sight some policies related to climate change, social development and gender equality, for example, do not have any clear relationship. However, it is important to formulate both analytical and policy frameworks that create synergies between responding to climate change and pursuing social goals, such as strengthening resilience to climate change stresses *and* improving gender equality. It is particularly important that climate change (sector) plans and investment plans, whether related to vulnerability reduction or GHG emissions mitigation, reflect **socially differentiated analysis of climate change impacts and adaptation actions and of GHG mitigation opportunities that offer various co-benefits**. The analysis would include, for example, differences due to gender, ethnicity, age, occupation and location, which should then lead to socially differentiated targets and actions. Urgent action is needed in the areas of securing livelihoods, health and human dignity for women, men and children, and especially for the poorest – including ethnic minority people in remote areas. This means that **livelihood opportunities** for less affluent men and women working in agriculture, animal husbandry, fisheries and aquaculture, and the forestry sector need to be strengthened. **Gender-specific actions** are also needed to support **small and medium enterprises, wage labourers**, and **urban** livelihood strategies. It is particularly important that **policies enable women and men to migrate without hindrance**. Gendered approaches are also urgently needed in DRR efforts, to ensure that responses to climate change–enhanced disasters create opportunities for achieving social goals instead of creating additional causes for inequality.[42]

Women are the main labour force in small scale agriculture

38. Climate change-related policy development, research, and awareness raising all face **coordination challenges**, as climate change relates to so many sectors and other strategies, action plans and national target programmes. The **overall leadership** for climate change policy development and implementation of the NTP-RCC is with a steering committee headed by the Prime Minister and an Executive Board, which is made up of representatives from different ministries. A Standing Office in MONRE is tasked with coordination of implementation of the NTP-RCC, but it has limited coordination capacities and participation of other ministries is still mixed. Experience with both long-standing and ad hoc coordination for responses to national challenges, such as the Central Committee for Flood and Storm Control (CCFSC), suggests that strong coordination between sectors and effective oversight (of investment projects, for example) can happen only if a National Committee is directly **supervised by the Prime Minister or a Deputy Prime Minister on a regular basis**. It also requires very strong support structures, well resourced with finance and significant numbers of high quality staff possessing a wide range of skills. The international community is supporting the Standing Office for the NTP-RCC, but further strengthening and active contributions from different ministries is needed. The very active participation of MPI and MOF especially is important because of the expected **changes in the nature of ODA to Viet Nam**. In the future, donors will pay much more attention to mainstreaming climate change in ODA and are expected to create new opportunities for international financing of climate change actions as per the rights and responsibilities defined in the UNFCCC and ongoing negotiations. With successful outcomes of the climate negotiations Viet Nam will be eligible for '*new and additional*' grant aid and concessional loans for responding to climate change because it is a country '*particularly vulnerable to the adverse effects of climate change*'.[43] However, Viet Nam's transition to middle income country status also means that it is becoming less eligible for other low-interest loans and grant aid from multilateral banks and bilateral donors. In other words, future ODA to Viet Nam is likely to be dominated by climate change.

39. **It is critical that within various institutions there is awareness** of the importance of climate change and that staff possess relevant **technical knowledge.** Therefore**, capacity building** on many fronts is urgent. With the implementation of the NTP-RCC, most ministries are being mobilised, and all face important challenges in this regard. Some have more capacities than others whilst all have **responsibilities**. Despite expressed interest by many, in most ministries climate change (mainstreaming) is not yet seen as very important, even though several are now being supported in their action planning on responses to climate change (within their sector). It is very important that awareness is raised further, that **technical advice on climate change mainstreaming** is provided, and that capacities are built during the early stages of the implementation of the NTP-RCC. The following are examples of capacities and responsibilities:

    - The Ministry of Agriculture and Rural Development (MARD) has taken on climate change as a major issue by setting up a dedicated office on climate change, and especially in disaster management and forestry action is being undertaken - though in both of these sub-sectors and in others there is still a lack of awareness and capacity.
    - The Ministry of Planning and Investment (MPI) is engaging with the issue as it has a central mandate for ODA coordination and management, but only a limited number of officials have a comprehensive understanding of climate change.
    - The Ministry of Finance (MOF) should become central to any efforts to finance climate change adaptation and to change the behaviour of businesses and private consumers through financial policies that help develop a low carbon economy.
    - The Ministry of Industry and Trade (MOIT) has a key role in enabling industry to explore opportunities for low carbon industrial investments, renewable energy production, and also through market regulation.

- Transfer and development of low carbon technology must be a key concern of the Ministry of Science and Technology (MOST).
- The number of specialist staff in the Ministry of Foreign Affairs (MOFA) with in-depth knowledge of the global climate change debates and international policy positions is still limited, but clearly the ministry has an important role in the ongoing international negotiations on climate change.
- The Ministry of Construction (MOC) and the Ministry of Transport (MOT) have critical roles in public infrastructure investment and regulation of, for example, urban development, with many implications for climate change adaptation (e.g. climate proofing of infrastructure) and GHG mitigation (e.g. energy efficiency).
- The Ministry of Education and Training (MOET) and the Ministry of Culture, Sports and Tourism (MOCST) have critical roles to play in mainstreaming climate change in curricula and training, in campaigns to raise awareness among the general public, in collecting data on the impact of climate change on tangible and intangible cultural heritage, and in tourism development plans, as tourist and heritage sites are significantly affected by climate change.
- The Ministry of Health (MOH) and the Ministry of Labour, Invalids and Social Affairs (MOLISA) have important roles to play in reducing vulnerabilities to climate change effects. For example, increased temperatures and changes in rainfall patterns are enhancing disease vectors. To address this problem requires strengthening social protection and health-care systems, and increasing public awareness. Several ministries also have responsibilities in terms of encouraging investments in social services that ensure they remain operational and accessible in times of natural disasters such as floods.

40. Many climate change responses fall, however, under the shared responsibility of different ministries and local authorities. **Provinces** and lower-level authorities must rapidly develop their action plans to respond to climate change too, which will also require large scale **awareness raising and capacity building efforts**. Ministries and **universities and training colleges** have critical outreach roles in this regard. MONRE officials, for example, have visited many localities and organised regional meetings to explain and discuss details of the NTP-RCC and the official climate change and sea level rise scenarios. Planning and action must also involve several **mass organisations** such as the Viet Nam Red Cross, but knowledge of climate change responses is still limited in some of these, such as the Women's Union and the Farmers' Union. This means that coordination and cooperation are critical for success.

VII. Strengthening resilience to the effects of climate change

41. The global consensus of the IPCC in 2007 was that in the worst case GHG emissions scenario the sea water level rise would be 0.59 meter by 2100. However, additional evidence indicates that it may be as much as 1 or 1.5 meters by 2100, or even more. Changes like this in predictions should have a major influence on, among other things, the planning of dykes to protect fields, villages and towns; lowland city expansion; construction and expansion of industrial parks; and construction of the subway rail systems that are being planned for Viet Nam's main cities. Viet Nam has included in the NTP-RCC a planning parameter of a 1 meter sea level rise by 2100. This is higher than officially predicted by the IPCC or Viet Nam (based on a medium global emissions scenario), but is justified on the grounds of the risk that things could be worse. Viet Nam also plans to revise its estimates in the coming years, based on additional national and international data.[44] Viet Nam should **consider the risk that things could be worse than even the worst case predictions** of scientists even before more evidence becomes available. This would mean that a greater sea level rise and bigger effects on typhoons, rainfall, drought and temperature should be considered in planning,[45] including long-term visioning, which has to be done now. These plans and the medium to long-term actions taken should be adjusted based on new facts that become available over time.

River bank erosion is becoming more acute with heavier peak flow

42. Climate change is affecting livelihood strategies of ordinary people, including decisions related to migration and agricultural and industrial production. Some people are experiencing reduced access to resources, such as fuel and water. Climate change affects men, women, boys and girls in different ways. Women are more likely to lose productive assets and entitlements (such as land), and may experience an increase in workload. Women's status and bargaining power may also be adversely affected. The NTP-RCC identifies the need to conduct vulnerability and adaptation (V&A) assessments at sectoral, regional and community levels, and identifies the poor, women and children as among the groups that are most vulnerable to the impacts of climate change. The NTP-RCC does not explain the different roles of men and women in responding to climate change, nor their responsibilities or decision-making powers, but these **social differences and social relations need to be analysed as an integral part of V&A assessments**.

43. In terms of adaptation to climate change, given a very uncertain long-term future, the creation of livelihood opportunities is important and should be central to policymaking and investment. For example, further improvements in land administration are needed in order to ensure not only women's *de jure* but also their *de facto* land rights in cases of divorce and widowhood.[46] **Migration** can cause extra stresses and risks for women and children. For example, in cases of migration in which female family members stay behind, they often are burdened with increased responsibilities but no clear advantages. This is one cause of the 'feminisation of small scale agriculture' in many areas. On the other hand, rural livelihoods resilience is also often being *strengthened* where household members migrate and send **remittances** back that can be used for investments in houses, education, land and/or production equipment. The difference in migration outcomes appears to depend partially on employment opportunities and the quality of work in urban areas, on household registration policies, and on livelihoods support services available locally (e.g. irrigation water and extension services that are accessible to women). Successful migration and remittances are also a function of the educational achievements of boys and girls, whilst access to education of migrant children depends on, for example **household registration** in receiving (usually urban) areas. The actual **creation of opportunities for climate change adaptation and strengthening of resilience** of the livelihoods of men and women thus depends strongly on **policy decisions and investments** at both the national and the local level, including migration policies and investments in high quality **education**. The effects of migration policies on creating equal access to services and on livelihood opportunities should thus be continuously assessed, and policies may need to be adjusted.

44. The need for **building resilience in the agriculture, livestock, and aquaculture** sectors stands out, as many climatic stresses affect these livelihood activities and a high proportion of comparatively poor and vulnerable people depend on them, especially women farmers and many ethnic minority people. Farmers already face the multiple risks of drought, heavy rains and floods, strong winds and extreme temperatures, saline water intrusion in the lowlands and soil erosion in the uplands – and all of these are getting worse. But both internationally and in Viet Nam investments in agricultural research and development (R&D) remain comparatively low, even without considering climate change effects. Important 'no-regret actions' are, therefore, to substantially **increase investment in crop variety R&D** and other aspects of (small-scale) **farming systems,** as well as in **better-targeted extension** that is accessible to women farmers. These investments will help ensure good yields in an even wider range of climatic extremes.

45. Viet Nam has a long tradition of coping with water-related disasters in the coastal and delta areas (e.g. typhoons, storm surges and river floods). Viet Nam also has many experiences with **participatory approaches to assessing vulnerabilities, capacities and resilience**, and many solutions are being found through increased local awareness, behaviour change initiatives and small scale measures such as construction of 'sub-floors' to protect food stocks from flood waters. Viet Nam has some very clear policy directions in

place, including a commitment to apply 'community-based disaster risk mitigation' (**CBDRM,** an approach that is normally very participatory) to the 6,000 most vulnerable communes (which includes roughly half of the country).

Clean water supply can be guaranteed during floods with simple and affordable technology[47]

46. There is also a need to apply **participatory approaches to large investment programmes,** and not only towards achieving behaviour changes and in small scale infrastructure projects. For example, it is widely agreed that people living in the Mekong Delta must develop a mindset of 'living with floods' – as distinct from engineering the delta in such a way that all river water is kept away from the land, and road transport becomes the focus instead of water-based transport.[48] Upstream deforestation and heavier wet season rain as a result of climate change are causing higher river discharges and sometimes flooding, though dam building may reduce peak flows. However, the net effects of these forces in the Mekong River have not yet been fully analyzed.[49] River floods are beneficial for soil fertility and fisheries and 'normal floods' recur annually. But the effects of climate change may make river flooding (occasionally) more extreme, and thus increase the challenges of living with the floods. One **resettlement policy** that addresses this is the ongoing construction and improvement of residential clusters. Under this policy, people living on scattered homesteads are concentrated on raised land, where schools, water supplies and other services are being made accessible year-round, i.e. also in times of extreme floods. In the most successful cases people have retained good access to their fields (often by water transport) and improved their access to services and markets (using both road and water transport). In the face of climate change this experience must be assessed critically, possibly adjusted, and scaled up further.

47. Other types of large-scale **infrastructure** are also needed to protect lives, livelihoods and property, ensure continued human development, and provide opportunities for employment. Saline water intrusion, typhoons and storm surges do not bring advantages as the fertile Mekong River water does. Furthermore, the Mekong Delta and other areas of

Viet Nam will also experience increased drought during some parts of the year, which means that infrastructure is also needed to store fresh water – underground and in reservoirs. It is important to recognize that the different functions of infrastructure require integrated planning and design. Along the entire Vietnamese coast, in the deltas and elsewhere, climate change effects are different and require different solutions. For example, reinforcement of **dykes** is needed to protect villages, towns and cities (including in Ho Chi Minh City), from storm surges that are set to become worse with climate change. Storm surges can be mitigated by widening and protecting the **mangrove** forests along the coast, but even then dyke reinforcement and construction may be needed in order to ensure increased levels of safety. **Storm surge barriers** may be needed to protect major harbours. **Roads, bridges and industrial parks need to be 'climate proofed'**, meaning their designs need to be adjusted to accommodate higher (average as well as maximum) sea water levels, higher drainage requirements, stresses on water supply, etc. Urban (underground) **rail, drainage and wastewater systems** must be designed or adjusted for higher rainfall extremes and peaks in water-discharge. Typhoons require reinforcements of private and public **buildings**. This can be achieved partially through adjustments to **building standards and practices**.

48. Enhancing resilience of people, geographic areas and sectors through creation of livelihood opportunities for men and women, and protection of lives, livelihoods and property with 'soft' measures and 'hard' infrastructure will require **very major investments** in master planning and the underlying research, capacity building and infrastructure. There is a need for investment in vulnerability and adaptation assessments; R&D in sectors such as agriculture; research capacity building at different levels; design of risk-mitigation measures and infrastructure; and design of 'climate proofing' of existing infrastructure – before actual investments can happen. There is a strong need for **information sharing and coordination** to ensure the involvement of Viet Nam's entire **scientific community** with strengthened links to **international centers of excellence,** as well as national and international **businesses** with major research, R&D and/or design capacities.

VIII. Mitigation of GHG emissions

49. A core principle in the UNFCCC that is also quoted in Viet Nam's NTP-RCC is that of 'common but differentiated responsibilities', especially for mitigation of GHG emissions. The questions of how much and how fast industrialised countries can reduce emissions, and whether middle income developing countries should agree to 'binding targets' on GHG emissions remain contentious. However, in Bali (at COP13, in 2007) it was agreed that developing countries should implement '**nationally appropriate mitigation actions**' (NAMAs). NAMAs should, according to many, be '**Measurable, Reportable and Verifiable**' (MRV). This means that Viet Nam should limit its growth in GHG emissions whilst making clean and affordable energy available to poor people and industries alike. There are indeed opportunities for Viet Nam to start preparing now for a low-carbon, developed economy by using modern technologies and making investments that should help save costs and be socially and economically attractive, while at the same time mitigating GHG emissions.

50. Moving towards a low-carbon economy and using international policy developments on climate change as a development opportunity is critical, especially as 'new and additional' finance is becoming available to developing countries and efforts at capacity building are stepped up. This should not be a major demand on Viet Nam's domestic public finances. For example, **technology transfer** is one of the core issues in the international negotiations, particularly technologies for low GHG emissions, although technology transfer for adaptation is also important. This is closely linked to the negotiations on additional finance and financing mechanisms, which should support developing countries in making energy available to low income groups, developing energy efficient manufacturing, generating renewable energy, improving energy efficiencies in transport and of buildings, and (with time) applying carbon capture and storage. Technology transfer, including the adoption and development of low GHG emissions technologies, is possible and can provide immediate benefits for **low income households, including social benefits**. Examples include micro-scale biogas and photo-voltaic systems, which can become commercially available and attractive to many users through concerted development efforts.[50]

51. However, most technology transfer should take place in the **manufacturing industry,** which needs benchmarks, transparent processes, and predictable revenue streams before major investments can be expected. Businesses need innovative ways to improve energy efficiency, conduct energy audits and implement (newly proposed) energy management standards, all of which the Government can help realize through support programmes. Businesses need access to capital, which can be supported through loan guarantee schemes (this has been applied already in a project focused on energy conservation in small and medium enterprises – see picture below). There is also a need for new, innovative and well-monitored (environmental) standards that businesses can adopt voluntarily. In addition, strong and independent agencies are needed that can undertake various kinds of environmental audits. Furthermore, there is a need for long-term thinking about the location of industrial parks, in order to protect them from floods and at the same time conserve the most productive agricultural lands. The location of coal-fired power plants should be in areas where there is potential for carbon capture and storage.[51] The primary roles of the **Government** in terms of technology transfer are **regulation, capacity building**, and providing some **incentives**.

Energy-efficient kiln supported by the Project on Energy Conservation in Small and Medium Enterprises (PECSME; Ministry of Science & Technology / Global Environment Facility / UNDP)

52. There is historical evidence supporting the view that **technological innovation** and increased financial flows to sectors such as forestry **can erode rather than improve the social status of women**. This is especially the case when gender roles are not clear and policy measures are gender neutral. This includes innovations at the household level that may have immediate economic benefits in addition to their environmental benefits, such as micro-scale biogas installations. It is critical, therefore, that gender analysis is included in strategies for technology development and transfer. Gender analysis is also important when undertaking campaigns to change behaviours that relate to GHG emissions – such as building awareness of the carbon footprint of consumer products – because the different capacities and roles of men and women in the household and in the community affect their consumption decisions, and therefore their contribution to GHG emissions mitigation. For example, women may be key agents in addressing the causes of climate change because of their role in making daily choices about household consumption.
53. **The Clean Development Mechanism** (CDM) under the Kyoto Protocol, which relates to the generating and trading of emissions reduction credits, **is functioning** in Viet Nam but **not yet on a large scale**. The CDM could ensure the financial feasibility of many high quality landfills, for example, and/or support hydropower investments. Viet Nam does have a set of regulations on implementation of the CDM. This includes the Prime Minister's Directive 35/2005/CT-TTg of 17 October 2005 about the organization for implementation of the Kyoto Protocol; Decision 47/2007/QĐ-TTg of 6 April 2007 about planning for the implementation of the Kyoto Protocol in the period 2007-2010; and Decision 130/2007/QĐ-

TTg of 2 August 2007 about mechanisms and policies for investing in CDM projects. However, blockages to full development of the CDM in Viet Nam still exist. These include a lack of awareness in the business community, a lack of high-risk investment capital, a lack of appreciation among officials of the benefits of CDM projects, and limited capacities at various levels of Government and in the business sector (including among those required to monitor carbon saved based on verifiable baselines). In addition, current regulation requires that all ODA-supported carbon finance credits under the CDM accrue to the Viet Nam Environment Fund and not to the project owners, which is a disincentive to investors. To ensure large-scale CDM application, **in-depth analysis of the barriers** and a **policy dialogue** between Government, businesses and international stakeholders is needed, as well as agreement on appropriate actions, especially in terms of regulation and capacity building.

Mangrove forests along the coast serve many purposes, including reducing the impact of storm surges[52]

54. Particularly important for Viet Nam, both within the country and as a participant in the international climate negotiations, is **Reduced Emissions from Deforestation and forest Degradation (REDD)**. This may involve (new, additional) ODA (public sector) funding for forestry conservation and protection, and/or funding from the proceeds from carbon trading, if accepted under a new agreement of the UNFCCC. ODA funding is likely to be dominant in the early stages. The inclusion of forests in carbon markets is expected, allowing industrialized countries to off-set agreed emissions reduction targets in this way. However, this is controversial because without associated deeper GHG emission reduction targets for developed countries, GHG emissions at the global level may not decline, and the incentives for (companies in) developed countries to invest in more environmentally

friendly technologies may be weakened. At the moment there is no international agreement on the principles and mechanisms for REDD, but a broad agreement is expected in Copenhagen. Viet Nam is being supported by the international community to prepare for the implementation of new REDD financing mechanisms, in other words to build 'REDD readiness'. REDD readiness includes: (a) the development of a strategy to reduce emissions from the forest sector; (b) building capacity to implement methods to measure and report on the amount of emission reductions from deforestation and forest degradation; (c) establishing a baseline, or 'reference emissions level'; (d) designing a system to distribute benefits from REDD equitably and transparently; and (e) building capacities to monitor these actions.[53] Success will depend on the continued full commitment of Viet Nam to **build capacities at different levels** and ensuring that the **additional financial resources** going to the forestry sector indeed **benefit those forest managers who achieve actual emission reductions**. The process of building REDD readiness has thus begun, and while it is not expected that many countries will be REDD-ready for several years, Viet Nam is well-placed to achieve REDD readiness at an early stage, perhaps as soon as an instrument comes into force under the Kyoto Protocol. Currently, it is anticipated that payments could begin in 2013 or soon thereafter.

55. Nationally appropriate mitigation actions (NAMAs) in the **agriculture sector** need to be in tune with country circumstances and capacity. For example, mitigation actions with high co-benefits in terms of food security, poverty reduction, improved gender equality and enhanced resilience of agricultural production systems will be important because a large share of Viet Nam's population depends upon farming. Examples of techniques with good potential to reduce or remove emissions which are already being applied in Viet Nam include the production and use of bio-gas from animal waste, the System for Rice Intensification (SRI)[54] and organic farming.[55] Agricultural NAMAs could also play an important role in reducing agricultural emissions and environmental pollution in more capital intensive production systems, while also facilitating adaptation to climate change. However, substantial public investment in **capacity building, institutional development, extension and farm financing is required** for women and men farmers to make a transition to sustainable agricultural practices.

IX. Improving knowledge and raising awareness of climate change

56. There has been substantial coverage of the climate change challenges in the national media over the past two years, including programmes for youth, and there is growing awareness of climate change impacts at the local level. Work by the Viet Nam Red Cross and NGOs, for example, have contributed to this growing awareness. There are also new initiatives to develop TV documentaries and publish written materials on climate change, including initiatives supported by the UN. And there have been several efforts to train journalists about climate change. Under the NTP-RCC there are plans for using considerable human and financial resources to achieve high levels of awareness among the general public of climate change. Indeed, **public awareness of climate change impacts and the causes of climate change** as they relate to social and economic development should be raised further: climate change must be understood as a **human development challenge**.

57. Current public discourse is concentrated on the effects of climate change on **natural disasters** and **agriculture** (primarily rice) production, but climate change effects and impacts on, for example, **health** are also important. Furthermore, **awareness of the need and opportunities for GHG emissions control needs to be increased** amongst state officials and the general public, as community action on this is still small scale despite several initiatives, including efforts by student organisations. In addition, there is a strong need to raise public awareness of the importance of conservation, given the importance of natural and cultural heritage to local communities and to Viet Nam as a whole in terms of GHG mitigation and adaptation actions (including forestry protection and expansion). To achieve significantly enhanced awareness will require coordinated efforts at an even larger scale by several ministries, mass organisations and both national and international NGOs, and will require involving more stakeholders than those identified in the NTP-RCC. Furthermore, awareness raising must lead to **behaviour change and action**, at personal and community levels, and in the Government as well as in corporations at all levels, which is perhaps the hardest part.

58. **Campaigns** on climate change can usefully build on and reinforce earlier messages promoting environmental sustainability, such as campaigns on the '*three R's*' (reduce, reuse and recycle) in consumption and manufacturing alike. Under the NTP-RCC and related actions, considerable human and financial resources are needed to reach the required levels of education and public awareness of climate change. Particularly important is mainstreaming of climate change (responses) in formal, non-formal and informal education, i.e. in **school and university curricula, teacher training** and campaigns focused on, and actively involving, children and young men and women: Experience in DRR has shown that **children can be important 'change agents'**. The UN along with several national and local partners has started to build up experience in this area, and prioritises campaigns focused on young people – if only because climate change is so evidently both a current and future challenge.

59. Viet Nam needs strong data to support policymaking and formulation of action plans and investment plans. The NTP-RCC aims to support this, as Viet Nam's **policy research capacity on climate change challenges needs strengthening**, especially in terms of the social and economic impacts of climate change and the economic opportunities to act on GHG emissions control (as mentioned briefly above). Generally, there has been little research on the gender dimensions of vulnerability to climate change, and on opportunities to strengthen both resilience to climate change effects and gender equality (for example in agriculture-based livelihoods). There is a lack of research on how decisions to migrate are made and how migration can increase resilience of migrants as well as relatives staying

behind. Much national data is still not routinely broken down by age and sex (for example data on the impact of natural disasters), which means that analysts and policymakers lack basic information for creating policies that serve social, economic and environmental goals simultaneously. There is also limited systematic knowledge of the roles and (practical and strategic) needs of women in greenhouse gas emissions mitigation and how these roles could be strengthened, although there is experience with, for example, micro-scale energy generation and energy saving initiatives that include key roles for women in households (such as biogas and fuel efficient stoves). Other examples where the **knowledge base should be strengthened** are cost and benefit projections of climate proofing of infrastructure; renewable energy generation; and energy efficiency in manufacturing. In addition, the use of financial instruments for promoting low-carbon innovation should be studied, such as carbon taxes, carbon cap and trade regulations, or subsidies.

60. Viet Nam has **many research organisations** but **few high quality researchers** focused on climate change related topics, and the country's **financial resources for research are thinly spread**. The research base is dispersed and whilst **research collaboration** is sometimes good, it is limited in many cases. For example, every ministry has a policy and strategy institute, various research institutes (working on specific topics), centres, and departments ('*cuc*') that may manage some research projects. The Hydro-meteorological Service (for weather forecasting) and the (research) Institute for Hydrology, Meteorology and Environment (IHMEN) are both under MONRE, as well as a (new) policy making Department on the subject ("Vu") – these collaborate well and have some high quality staff, but human resources are too limited for the challenges ahead. Universities have a research mandate but have limited research resources, and many staff (must) focus on lecturing. MOST has a mandate for guiding research and the Viet Nam Academy for Science and Technology (VAST) is home to several institutes that have climate change-relevant expertise. The Viet Nam Academy for Social Science (VASS) has institutes that can bring the geographic, social and economic angles to the climate change issue, but ialso has limited funds. There are also some Vietnamese research-NGOsthat capture some international research funds, for example under the Viet Nam Union for Science and Technology Associations (VUSTA).

61. There is an urgent need to **strengthen research collaboration**, and mobilize Vietnamese scientists to undertake comprehensive and integrated scientific assessments of climate change that would go considerably beyond than the efforts that are currently underway for the Second National Communication to the UNFCCC. This is also highlighted as a **priority activity under the NTP-RCC**. In order to deal with the challenges, the research and development community needs to be mobilised to undertake significant research on climate change adaptation and on development opportunities for low GHG emissions. Geographic and thematic research data should be gathered together through strong cooperation between knowledge centres, with support from international organisations as well as international centres of excellence. With support from the UN, several leading researchers have started informal discussions about the creation of a **Viet Nam Panel on Climate Change (VPCC)** along the model of the IPCC. The aim of the VPCC could be to promote research on all aspects of climate change and provide inputs to the IPCC assessment processes. It could organise itself similarly to the IPCC, with working groups to assess (a) the scientific basis of climate change in Viet Nam; (b) climate change vulnerability and impacts, and options for climate change adaptation; and (c) options for GHG emissions mitigation that are appropriate for Viet Nam. It would hold conferences to reach scientific agreement on a summary of the latest research findings concerning climate change impacts on Viet Nam as well as opportunities for low carbon development. The VPCC would agree on a Chairman and a core group or Board, with scientists who represent different academic disciplines. Members of the Panel would participate on personal title, but their employers would be expected to support these scientists in their participation in the VPCC. A VPCC Secretariat would be created, especially for coordination.

X. Finance and investment for responding to climate change

62. **Financial needs** for climate change adaptation as well as GHG emissions mitigation are enormous, according to several international analyses.[56] Viet Nam must finance the reduction of vulnerabilities to mitigate climate change impacts, and it also needs investment in the public and private sectors to mitigate GHG emissions. Some work on 'low hanging fruit' or 'no-regret investments' in improving energy efficiency are well known: investment in crop variety R&D as well as strengthening of health and education services are seen as critically important to raising standards now, instead of waiting for setbacks in human development as a result of climate change. The **international climate negotiations** are heavily tilted towards discussions about the way funds will be raised in the richer, high carbon-consuming countries, and how, and how much, finance should be channelled to the countries that are particularly vulnerable to climate change and which are being asked to limit their GHG emissions growth. The funds would come through both markets and public (ODA) channels. Many developing countries and groupings of countries are holding out for large transfers to help them address the challenges of climate change, based on analytical work showing the costs of climate change, including the costs of responding to climate change.

63. Viet Nam is expected to become a Middle Income Country (MIC) soon, meaning that general ODA funds are expected to decline. However, Viet Nam will be eligible for a significant share of 'new and additional' grants and concessional loans under the UNFCCC, to support adaptation and GHG mitigation. How substantial the financial outcomes of the international climate negotiations will be is unclear, but there is already a trend of re-prioritising ODA towards climate change responses and mainstreaming of climate change in wider development efforts. It is clear that **future ODA to Viet Nam may be strongly focused on climate change**. ODA will be important in the short term because of the general expectation that early GHG emissions mitigation actions will reduce the costs of adaptation actions later on, among other reasons.

64. The Global Environment Facility (GEF) is the official financing mechanism of the UNFCCC, and is expected to receive increased funding if governance of the GEF is improved. Viet Nam may also get financial resources from the Adaptation Fund (funded by a CDM levy under the Kyoto Protocol); from climate financing windows of the development banks;[57] and from REDD or (other) new financing windows[58] that are expected to be created under the UNFCCC. This would all be in addition to focused bilateral ODA.[59] These financing opportunities are expected to follow different ODA modalities and will result in partnerships with different stakeholders in Viet Nam, including sector ministries and provincial authorities. Viet Nam will need **substantial capacities to access such funds**, requiring concerted efforts to **learn** about funding options, as well as excellent **cooperation** between the MOF, MPI, MONRE, MARD, MOIT, and other sector ministries. Viet Nam could also follow the example of other countries and take a programmatic approach to addressing the research, technical and capacity building aspects of the NTP-RCC as well as the actions currently being formulated under the sectoral and provincial actions plans. This could then become the programmatic basis for setting up a climate change Trust Fund to receive and manage international funds according to nationally appropriate, harmonized rules, especially for funds aiming at technical assistance and capacity building.[60]

65. For Viet Nam to be able to finance the many billions of dollars needed to address sea level rise and other climate change effects in the coming century, it cannot rely solely on ODA, but must also **raise investment capital domestically**. This concerns for example coastal protection and city drainage, which will be largely financed by the public sector. There is

also a need to stimulate financing through domestic markets for climate responses, especially to limit GHG emissions growth (the CDM mitigation actions *for* entities in developed countries through actions in developing countries is discussed in Section VIII). However, there is limited experience in Viet Nam with **financial policy instruments** that could provide clear market signals to the public and businesses to reduce climate change vulnerabilities and to control GHG emissions. Viet Nam has yet to decide on, or experiment with, various forms of **carbon taxes** or a **domestic carbon cap-and-trade system** that are meant to influence GHG consumption and production patterns. There is a strong need to learn about these, and build capacities to implement them. Revenues raised from domestic carbon taxes could partially be used for financing climate change adaptation. Both domestic and foreign private sector investment capital could be mobilised to support responses to climate change. To do this, Viet Nam would need to ensure that overall business regulation is complete and transparent, which would lead to predictable revenue streams from green (domestic and foreign) business investments. For example, there is some experience with, and planning of, 'index-based' **insurance** such as crop insurance schemes to transfer Mekong River flood risks to international markets based on upstream river water levels. However, Viet Nam has limited institutional or regulatory capacity in this area. There is a strong need, then, to **strengthen capacities at many levels** to develop and apply financial policy instruments and index-based insurance to reduce climate vulnerabilities.

66. The Government can also **enhance the voluntary behaviour** of businesses and other organizations through regulation of innovative (voluntary) standards, among other things, and it can **enable domestic, voluntary carbon trading**. There are increasing appeals to the international and national business communities to take 'social responsibility' for their actions - for both ethical reasons and in response to consumer demand for 'green' and socially acceptable production and trading practices. This is leading to, for example, voluntary carbon offsets by businesses and also public institutions and NGOs through the purchase of carbon credits. In other words, businesses and public institutions and NGOs indirectly invest in forestation schemes, methane capture, or other initiatives that result in a reduction in GHG emissions. In addition, Viet Nam has some experience with **loan guarantee funds** that improve access to capital and reduce investment risks for companies that invest in energy efficiency, low GHG emissions technology, and renewable energy generation. However, the scale of these efforts is still limited and many entrepreneurs and banks are not yet convinced.[61]

67. There is **a need for formulation of investment plans for climate change proofing of infrastructure**. However, Viet Nam has no regulation on climate proofing yet, and capacities for making the complex benefit-cost analysis needed prior to making such investment decisions.[62] Investments would initially focus on the 'low hanging fruit' or 'no-regret investments' in infrastructure, for example, to ensure that education and health infrastructure operates and remains accessible to the most vulnerable people during and immediately after climate-related disasters. Later, the financially riskier investments could be addressed, based on improved knowledge of potential impacts of climate change and the extra costs that would be incurred. For the main issues of sea level rise and related saline water intrusion, and the need for protection of deltas and coastal regions, large investments in studies and designs should be planned over the coming years and decades, followed by major infrastructure investments. The scale and time-span of these projects is unprecedented.

68. The **financial and economic crisis** that started in 2008 has been combined in Viet Nam with several structural problems in the economy. The crisis has been addressed with large-scale bailouts of banks in rich countries and also support to banks elsewhere, whilst many have called on rich country and large developing country governments to use economic stimulus funds for investment in infrastructure and technology to help address climate change impacts and mitigate GHGs. The Government of Viet Nam is also taking a

range of measures to protect businesses and generate employment. The financial crisis should however also be taken as an opportunity for addressing some of the climate challenges. Domestic resources for financial stimulus are limited, but these funds for stimulating the economy could be prioritized to support activities such as small-scale infrastructure development that is 'climate proofed', thus helping **protect Viet Nam against the effects of climate change** (including typhoons, floods and droughts), in addition to generating employment. Investment in energy efficient technology, including in the manufacturing sector, is also possible, and would provide both economic and environmental benefits.

XI. Participating in international climate change negotiations

69. It is important to 'seal the deal' at the fifteenth Conference of Parties (COP15) to the UN Framework Convention on Climate Change (UNFCCC) to be held in Copenhagen in December 2009, meaning that the 'Bali Roadmap' agreed to at COP13 in late 2007 is developed into a fair and useful agreement on 'long term cooperative action'. The Parties to the Kyoto Protocol are also negotiating emissions targets for the 'second commitment period' (expected to be 2012-2016). The negotiations are very challenging and only a 'framework agreement' may be reached in Copenhagen, that would be worked out in later meetings. The negotiations are very important for Viet Nam, which stands to lose a lot if enhanced international cooperation on the causes, as well as the effects, of climate change is not agreed upon and implemented quickly. Viet Nam is in a position to **help shape international climate policy** that would serve its interests and those of similar countries, and **play an active and constructive role in international climate *diplomacy*.** A successful outcome of Copenhagen (and beyond) can only be expected through: intense (formal and informal) dialogues among developing countries, donor countries, and international organisations; strengthening of coalitions (for example among ASEAN countries and their close partners); formulation of feasible international policy positions; and active searching for agreements and compromises. **MONRE and MARD** are active already and have capacities in these areas, but successful climate diplomacy will require more **active involvement and strengthening of capacities, especially in other ministries.** The UN and other partners, in collaboration with MONRE, have undertaken several capacity building efforts in climate policy and diplomacy, but committed engagement of some key ministries – through staff with good foreign language skills and climate change knowledge and a mandate – has been lacking. Success in helping to achieve international agreements requires strong determination by the Vietnamese leadership, including investment in human resources for climate negotiations, capacity building and also travel. International support is also needed.

70. The **UNFCCC and the Kyoto Protocol are the legal basis** for the international negotiations, and it is important that all Parties, including Viet Nam, ensure that the agreements in Copenhagen (and beyond) lead to full and effective implementation of the UNFCCC. Agreement should be reached on the **main issues,** notably (a) GHG mitigation targets for developed countries; (b) adaptation actions, especially in developing countries such as Viet Nam; (c) 'new and additional' finance for climate change responses through effective mechanisms and with 'equitable' governance; (d) firm commitments on capacity building and technology transfer; and (e) REDD. These negotiation issues are all of particular **importance for Viet Nam**.

71. Because climate change is a human development challenge, it is essential that in agreements on all these issues the principles of **sustainable development** are reflected, including (short-term) poverty eradication and protection from climate change effects; economic growth; socially just development including gender equality; and long-term environmental sustainability (taking into consideration 'future generations'). Viet Nam can enable this at an international level by building on its experience with implementation of the Viet Nam Agenda21 and mainstreaming of sustainable development principles in its Social Economic Development Plan (2006-2010), among other ways.

GHG emissions mitigation

72. The UNFCCC expresses the principle of '**common but differentiated responsibilities**',[63] meaning, among other things, that developed countries are primarily responsible for

reducing their GHG emissions and for providing financial support to developing countries to help with both climate change adaptation and GHG emissions mitigation actions. Depending on their relative capacities, developing countries will undertake 'nationally appropriate mitigation actions' (NAMAs), according to the Bali agreement. Such actions are already being undertaken in Viet Nam, supported by national financial and human resources as well as ODA. This consistency with international agreements and the fact that Viet Nam is acting proactively (as can be seen in the NTP-RCC, for example) gives the country advantages in making the case for 'new and additional' international finance[64] for both climate change adaptation and GHG emissions mitigation actions. Viet Nam's capacities are considerably higher than most Least Developed Countries (LDCs) and Small Island Developing States (SIDS), which are singled out in the UNFCCC as particularly deserving of international support. This means that Viet Nam will also be expected to continue to make significant domestic contributions to climate change actions.

73. The principle of 'common but differentiated responsibilities', notably regarding developed countries' historical and current GHG emissions responsibility and related mitigation targets, and the non-binding responsibilities for greenhouse gas mitigation by developing countries (NAMAs) will likely remain central in forthcoming climate agreements. Viet Nam is not expected to divert funds away from efforts to reduce poverty, improve basic services, provide social protection and generate employment. In this context, Viet Nam should pursue **'win-win' GHG emissions mitigation actions where possible**, meaning initiatives that promote socio-economic development and GHG emissions mitigation simultaneously. These efforts would receive at least some financial and technical **support from developed countries**. There are many opportunities for developing countries to make a significant contribution to international GHG mitigation efforts, with existing as well as new technologies. Examples include technologies for improved energy efficiency of buildings and manufacturing, biogas production, and agricultural practices to limit methane production. Developed countries' GHG emissions mitigation actions as well as their support to GHG mitigation in developing countries should be 'Measurable, Reportable and Verifiable' (MRV), per their responsibilities under the UNFCCC. If developing countries such as Viet Nam take **GHG mitigation** initiatives that are only supported domestically, they **could also follow the MRV principle**, which would help convince other countries that Viet Nam is playing its part in addressing the causes of climate change, even if it has no historical or legal responsibility. However, what MRV means for different actions is not yet agreed internationally, and many developing countries may need international support to implement this.

Climate change adaptation

74. Some SIDS may disappear because of sea level rise, and in countries with major deltas such as Viet Nam large numbers of people will be affected unless major action is taken. Some dryland countries may face a (further) reduction in annual rainfall, and countries that suffer river floods in the rainy season will experience even worse floods due to heavier rain, concentrated in a shorter rainy season.[65] Viet Nam will face more floods and landslides, more droughts, sea level rise and further saline water intrusion in the deltas, and more and more intense typhoons. All of these climate change effects imply additional, negative pressures on livelihoods, businesses, and social and physical infrastructure. Countries have different levels of resilience and different capacities to deal with the effects of climate change, which determine the impacts of climate change effects on people, communities, sectors and the overall economy. Countries' capacities also determine their comparative needs and claims on international climate finance, and Viet Nam's capacities are good compared to many other developing countries. But while LDCs and SIDSs are singled out in the UNFCCC, **Viet Nam** is clearly a country that is '**particularly vulnerable to the adverse effects of climate change**' and '**should be given full consideration**' for support to adaptation actions under the UNFCCC.[66]

75. **Viet Nam's climate change adaptation needs** include enhanced DRR measures; awareness raising and behaviour changes in the area of disaster preparedness; strengthening of social protection systems targeting the most vulnerable; improved access to, and continuous provision of, social services; strengthened social and commercial insurance for climatic stresses; strengthened livelihood support services such as agricultural extension; strengthened R&D efforts, especially in agriculture; large scale infrastructure investments and 'climate proofing' of other infrastructure; and greatly improved planning of industrialization and urbanization. **The UNFCCC negotiations must result in the establishment of comprehensive adaptation institutions, and commitments** to support developing countries in adapting to climate change. This could include (a) an Adaptation Protocol or COP decision with additional details on adaptation commitments; (b) a new Subsidiary Body for Adaptation, e.g. to plan and monitor adaptation actions; (c) the establishment of regional centres of excellence to develop and disseminate technical knowledge; and/or (d) establishment of a general adaptation financing window under the supervision of the COP (in addition to the Kyoto Protocol's Adaptation Fund and using a levy on CDM proceedings) focused on financing of capacity building, vulnerability and adaptation (V&A) assessments, preparation of national adaptation strategies and action plans, implementation of various adaptation actions including climate proofing of infrastructure, and education, training and public awareness raising on climate risks and mitigation of impacts.

Vietnamese negotiators at COP13 (December 2007, Bali), headed by HE Pham Khoi Nguyen, Minister of Natural Resources and Environment (centre)

Financing and financial institutions

76. Developing countries face the challenge of finding the financial resources for the immense challenges posed by climate change adaptation and GHG mitigation. Without a **significant decision on international financing for adaptation**, the developed and developing countries are unlikely to reach a successful outcome in Copenhagen (and beyond). Financial *demands* by developing countries of 'new and additional' funds (UNFCCC, 1992), as well as estimates of the cost of responding to adaptation and GHG emissions mitigation *needs,* are often expressed as a percentage of annual GDP of developed countries, starting at 0.5 percent. This has caused much debate, in terms of both the historical responsibility of developed countries and the feasibility of such huge financial transfers (which would be equivalent to current total ODA, or more). There is a need for new, innovative sources of funding, such as levies on international travel. Viet Nam should **indicate the magnitude of its needs** in the thematic areas for which financing is required. This would strengthen its role in the international negotiations, especially if high quality, trustworthy assessments were produced. The World Bank and ADB have started to work on this with Vietnamese partners, though more work is needed, particularly in a way that builds Vietnamese capacities to do such assessments.

77. It is widely though not universally accepted that the 'new and additional' funding should be mainly **public funding.** However, there is disagreement over whether **carbon markets** and **private sector investment** should play core roles or will merely provide complementary funding. Most countries agree that there should be separate (public) funds or special windows in any fund to finance the primary **climate change needs:** adaptation, mitigation, technology transfer, capacity building, and REDD, though there is no agreement yet on how the fund(s) would be governed. The Adaptation Fund has been established and receives funds from a levy on the CDM (which falls under the Kyoto Protocol), but this fund has limited resources and although the governance arrangements are seen by most developing countries as sufficiently equitable, detailed eligibility criteria have not been agreed upon yet. Currently the GEF is the official financing mechanism under the COP, but its replenishment, governance structure, and access by LDCs, for example have been criticized. Developing countries demand that governance of climate change finance (i.e. of GEF, and/or a new climate fund) reflects 'equitable and balanced representation' of developing countries, as the UNFCCC calls for. Funds should also be made more accessible, and direct management by developing countries instead of through multilateral organizations should be an option. Some developed countries stress the need for transparent financial management and conclude that there is a key role for multilateral banks and also for the UN, with the GEF as the main financial mechanism. These discussions on GEF and new funding windows, leaves open the question of the degree to which bilateral climate funding and climate windows under the multilateral development banks (such as the CTF) will be monitored, reported on and verified as 'new and additional' funds under the COP.[67] Some propose a new financial *architecture* under the COP to supervise and coordinate all funding sources and modalities, although the UNFCCC talks of a '*mechanism'*. Viet Nam should **actively engage** in these negotiations as the country has major **financial needs** as well as **substantial experience** with different international funding mechanisms, such as GEF; general budget support (policy lending based on a 'policy matrix' instead of individual projects, i.e. a model of 'direct access'); programmatic financing; funding of large projects from several multilateral funds; the 'One Plan Fund' of UN organizations in Viet Nam; other multilateral and bilateral ODA funding modalities; and with the CDM.

Capacity building and technology transfer

78. Developing countries need capacities to effectively implement measures for both climate change adaptation and GHG emissions mitigation, and this requires the application of

appropriate technology, including licensing of patented technologies. Capacity building is therefore needed for employees in the public and private sector, in the research community and in the education sector. Technology transfer plays a key role in response to climate change, but institutional, financial, legal, and political barriers can be high. Many developing country businesses, including manufacturing industries, experience the common problem that access to technologies is difficult without the support of the public sector – especially in terms of training and financing. Several proposals have been made to provide financing and support capacity building, R&D and intellectual property rights (IPRs) issues in order to enable technology development and transfer to developing countries. However, a satisfactory agreement to address the barriers facing developing countries in their attempt to access technologies for mitigation and adaptation has not been reached yet. It is therefore critical that **Viet Nam engages actively** in the negotiations on technology development and transfer, especially due to the country's **great need for renewable and low emissions energy generation** as well as **modernisation of key industries** such as cement.

79. Establishment under the COP of a **Subsidiary Body on Technology** has been proposed, which would help plan, organize, coordinate, monitor and evaluate international technology development and transfer to developing countries. This subsidiary body could create technical panels to support capacity building and other cooperation such as sharing of intellectual property rights, and support monitoring, reporting and verification. A **climate technology fund** (or window within a general climate fund, under supervision of the COP) to support developing countries with action on mitigation and adaptation has also been proposed. Furthermore, the proposal to set up **(regional) centres of excellence** to ensure international cooperation on R&D and information sharing is broadly supported. It is critical for Viet Nam to fully engage with the dialogues about these options, as it has major interest, especially given its rapidly growing manufacturing industry. Related to this, especially at the national and regional level, is the need for countries **to access UN technical assistance** in all relevant fields, from different UN organizations. For developing countries to build their capacity to address to climate change while accelerating human development with technical support from UN organizations requires dedicated financing and appropriate fund management arrangements. The **UN must tailor its support** to meet specific demands and needs – of Viet Nam in this case – and must provide the knowledge and skilled required for both climate change adaptation and greenhouse gas mitigation actions.

REDD-plus

80. Based on paragraph 1(b)(iii) of the Bali Action Plan, **REDD-plus** is being negotiated **–** REDD-plus stands for 'reducing emissions from deforestation and forest degradation' in developing countries, and includes forest degradation, the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks in developing countries. The key negotiation issues include:

    - the scope of REDD-plus (whether or not to include natural forests and/or plantations)
    - involvement of indigenous peoples and local communities
    - the relationship between REDD-plus actions and NAMAs
    - developed countries and carbon off-sets (whether to use REDD-plus to meet emission reduction targets of developed countries or to focus on domestic actions in and for developing countries)
    - financing (fund-based, market-based, or a phased and combined approach)

    Viet Nam has a strong interest in these issues, and especially in supporting a broad scope for REDD-plus. This would include guarantees that international financing will benefit local

(ethnic minority) people and forest managers in upland areas and the coastal (mangrove) strips; and that financing is 'new and additional' to current ODA and private investment in the forestry sector. Capacity building is also critical so that Viet Nam can take voluntary, domestic actions to reduce emissions from deforestation and forest degradation.

81. **UN-REDD** and the World Bank's Forest Carbon Partnership Facility are existing facilities for financing REDD readiness, and governance structures and procedures for both have recently been established. The oversight of these existing facilities could be brought under the COP, or there could be a REDD window established in a new multilateral (mitigation) fund, which many parties appear to support. Viet Nam is the first country to have set up a project under the UN-REDD programme, and could therefore share experiences with other countries on how public funds that are new and additional to existing ODA can be used to support multiple development goals, including social and economic development of ethnic minorities, and GHG mitigation.

XII. Concluding remarks

82. Climate change is happening and Viet Nam is particularly affected by its adverse effects. Fortunately Viet Nam also has substantial capacities to respond and the international community stands ready to support climate change adaptation both financially and technically. Viet Nam's long history and capacities to mitigate climate disasters stand out compared to many other developing countries. It also has research and development capacities in the agriculture sector, and substantial intellectual capacity and human resources in the area of water management. Viet Nam has civil engineering capacities and has built up significant experience with participatory, community-based approaches to DRR and small scale infrastructure development, for example. The country is developing its social protection systems, as well as the quality of and access to basic social services (water supply, health care and education). All these capacities, together with (hopefully) strengthened international cooperation in the areas of research, capacity building, planning and investment, mean that climate change adaptation does not need to be limited to avoiding the harms of climate change. With the right policies and capacities in place, **adaptation to the effects of climate change can offer opportunities for *strengthening* human development**. Social equality, wealth generation, safety levels (for example safety from floods), and environmental quality can all improve substantially over the coming decades. **Development ambitions can therefore remain high *despite* climate change**.

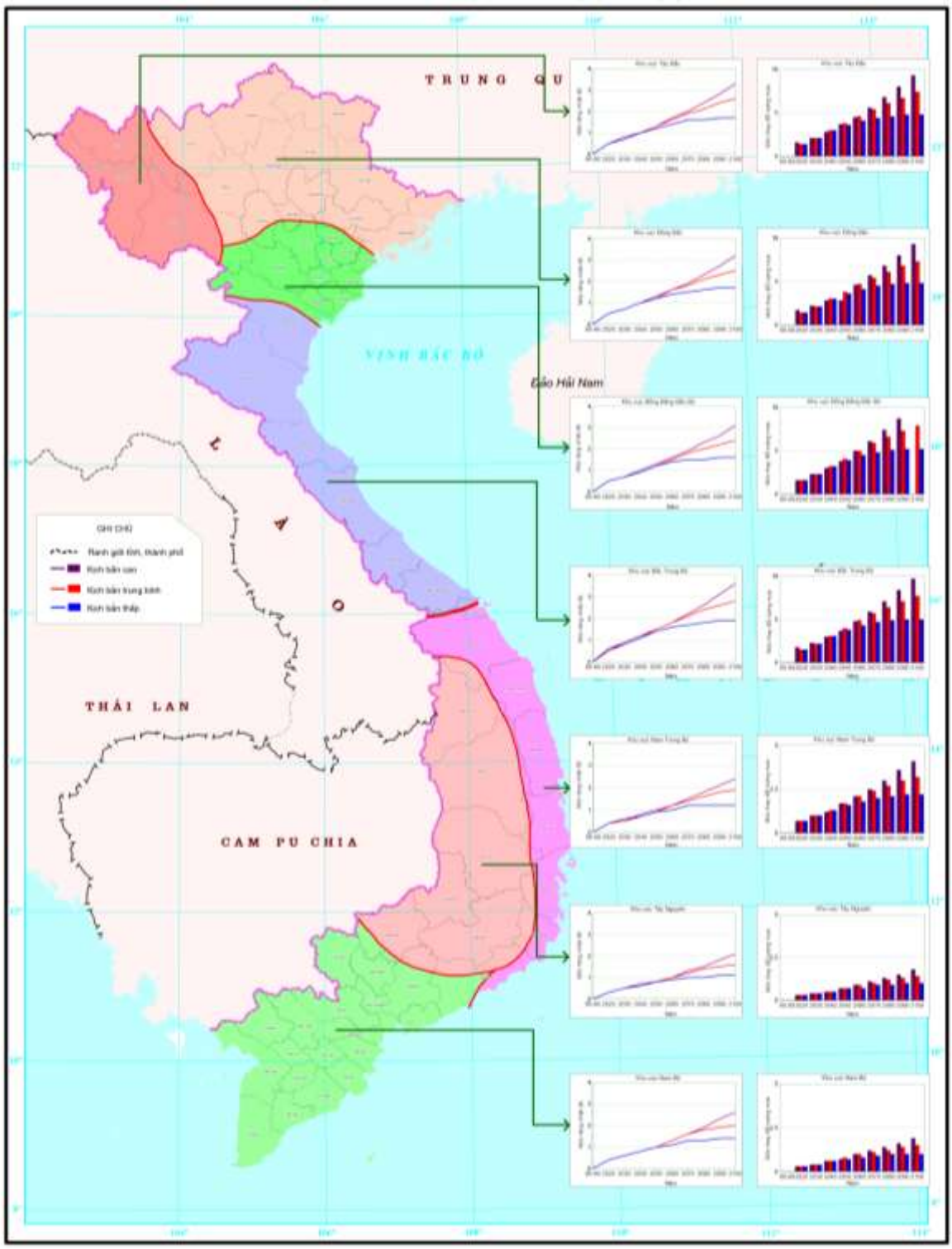
83. Viet Nam also has a rapidly growing economy that is energy hungry, and it has fossil fuels. To use fossil fuels and increase GHG emissions is Viet Nam's right, historically, but it also has both the responsibility and capacity to do this in very prudent ways whilst there is no need to increase emissions to the levels of the already developed nations. Furthermore, it also has other options to supply energy, including expansion of hydroelectricity generation. Viet Nam's economic growth, as well as the (hopefully) forthcoming increase in international financing and technology transfer offer many possibilities for improved energy efficiency and technological renewal in both the public and the private sectors. Moving towards a low carbon economy has other benefits in addition to greenhouse gas emissions mitigation, not least of which is improved air quality in cities and reduced risks of respiratory diseases. Viet Nam also has the potential and capacities to improve upland and coastal forests with additional international finance from REDD (to ensure carbon sequestration). At the same time, this could generate benefits for local people who are dependent on forests, and enhance dyke protection through improving mangrove forests. With the right domestic policies, good international relations, and political will on all sides, **global and national efforts to mitigate greenhouse gas emissions can become a development opportunity for Viet Nam, including its business, forest managers, and citizens.**

84. In order to achieve these ambitions and create opportunities, it is of utmost importance that the Vietnamese Government continues to demonstrate its commitment in dealing with climate change, both nationally and internationally. The **UN must uphold its global mission** by ensuring that Viet Nam and other member countries follow their treaty obligations as they relate to climate change, sustainable development, human rights and cultural protection. The UN and other partners must help Viet Nam, and enable it to set a strong example of an inclusive and comprehensive approach to development in which climate change responses are mainstreamed, demonstrating that both the climate change effects and the causes are fully addressed. The UN must continue to convene stakeholders in policy dialogues at the international and the national level and help them reach agreements, while also supporting national capacity development and resource mobilization for and with both Vietnamese and international partners.

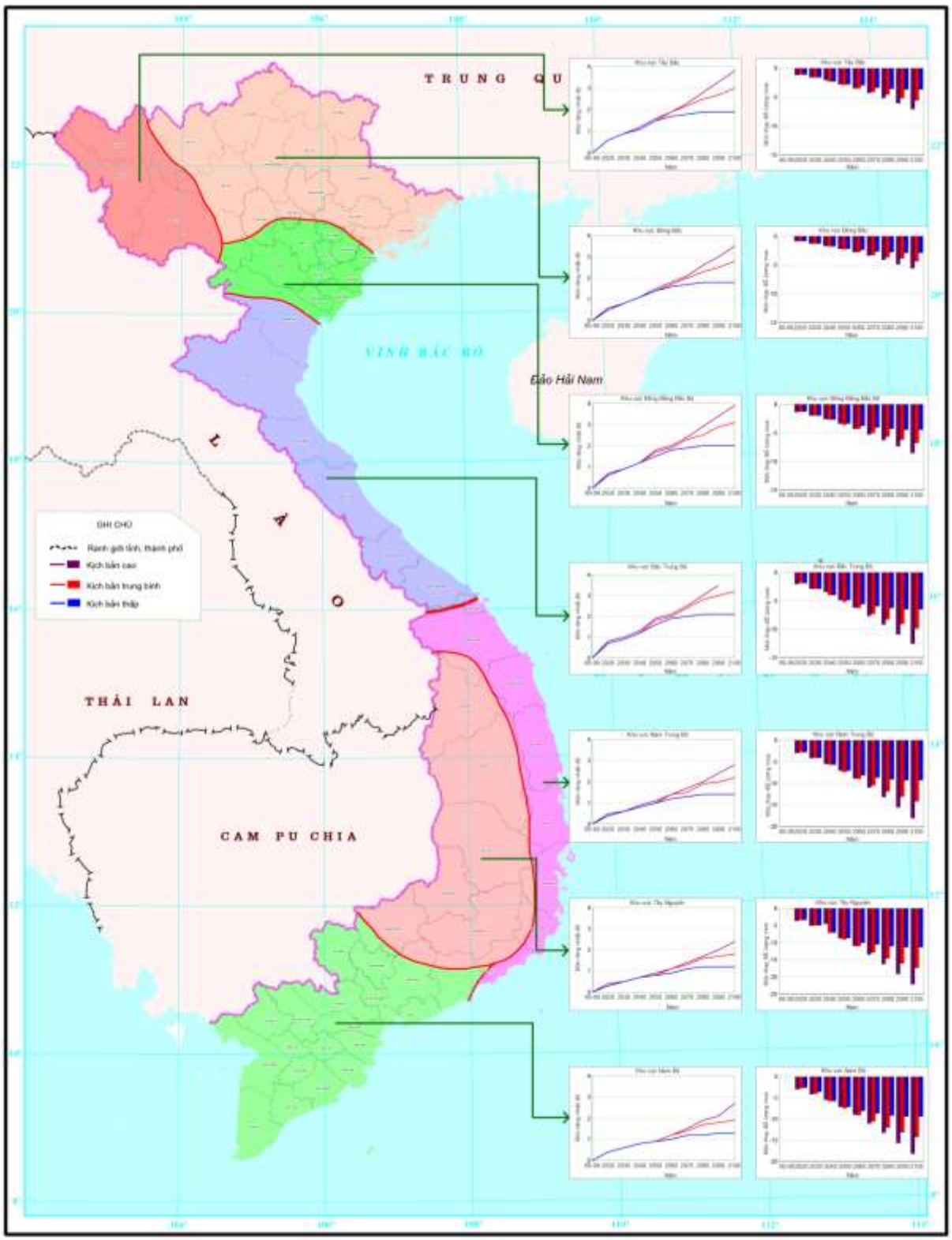
Annex 1 Examples of climate change actions supported by the UN in Viet Nam

- A **climate change policy project**, with MONRE as well as MARD. This helped the formulation of the National Target Programme to Respond to Climate Change (NTP), supports the application of 'global climate models' to Viet Nam, supports NTP implementation, and supports information management and awareness raising.
- Support **for Vietnamese climate negotiators**, with MONRE and others. Support to the **Second Communication** to the UNFCCC.
- The UN is also helping **young people** to engage with the negotiations, and raises national awareness on climate change, including the negotiation issues.
- Institutional strengthening in government planning on **sustainable development and climate change**, in partnership with the MPI. This is set to help mainstream climate change responses in strategies and plans (SEDS and SEDP), and in planning instruments such as Strategic Environmental Assessment.
- Disaster risk management has been supported, including improving **early warning** for disasters and support to the government programme on **safe settlement areas** in the Mekong Delta; appropriate small scale **water management infrastructure**, storm resistant housing, and flood resistant schools have been built. Ongoing support is about **institutional strengthening**, for example analytical work, and training (curriculum) development (with MARD).
- The UN is doing research on **vulnerabilities and adaptation** options in collaboration with several national and international partners, for example on coastal rural livelihoods and on gender and climate change links. The UN also plans work on migration and settlement in the context of climate change, on urban development, and on the impacts on workers and the poor of climate change in the Mekong Delta.
- **Community based adaptation** projects have registered some successes and more are being planned, e.g. in improving land management in the face of desertification that is enhanced by climatic drought (in several provinces, localities).
- A UN-REDD project to enhance GHG mitigation action by strengthening **forestry** has been initiated, with expected co-benefits for local forest managers. REDD could also have advantages for local livelihoods and for DRR (coastal mangrove reduces impacts of storm surges). In partnership with MARD and local authorities.
- UN organisations and national partners are implementing several projects on **energy efficiency and clean production**, with GHG emissions mitigation benefits, focused on introducing new technologies and practices and enabling larger scale application.
- A State of the **World Population Report on climate change and women** is being prepared, and '**climate proofing' of infrastructure** will be addressed in a new project.

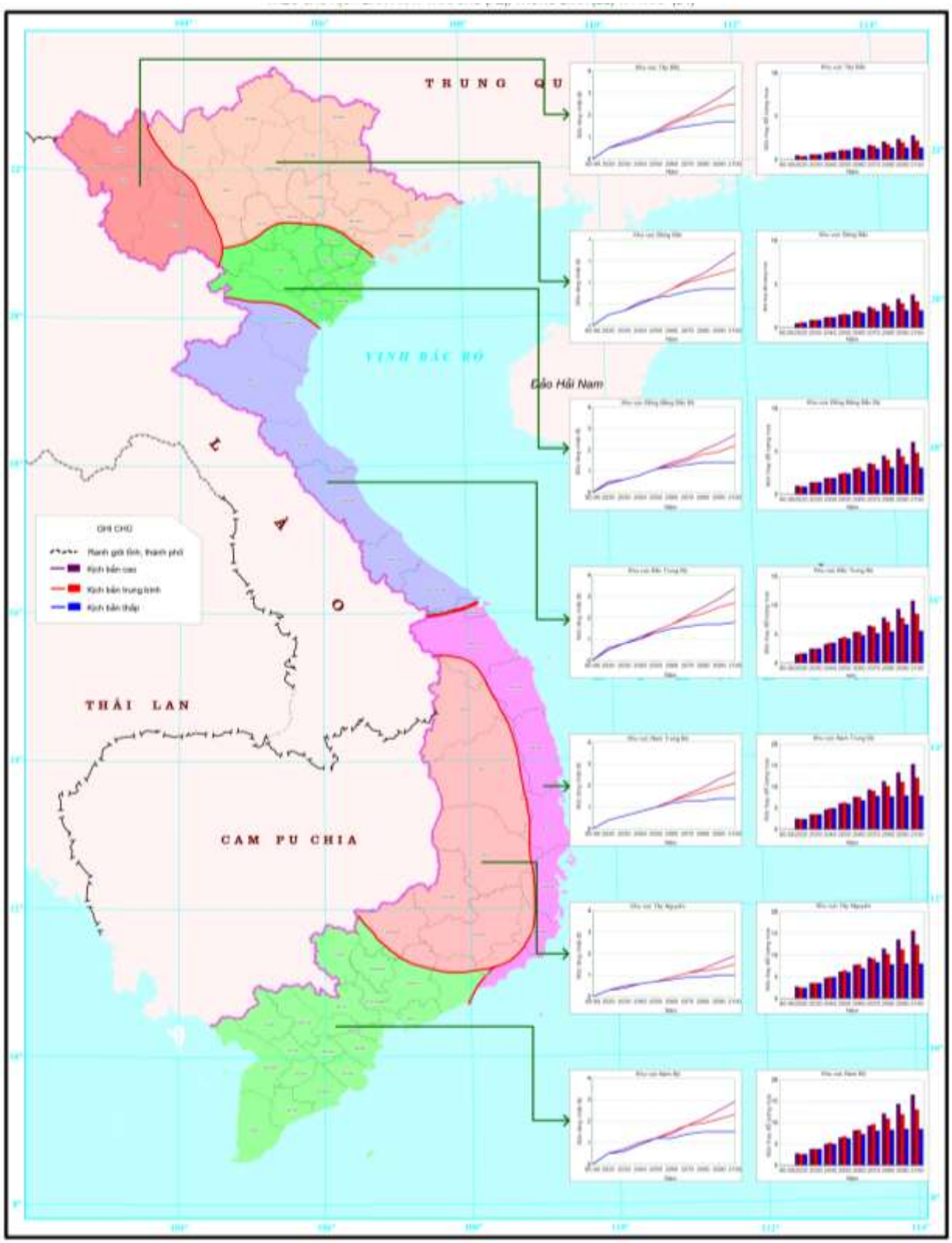
Annex 2 Climate change in Viet Nam



Change in average annual temperature (°C) and average annual rainfall (%) in Viet Nam's climate zones during 2000-2100, relative to the average for 1980-1999, according to low (B1), medium (B2) and high (A2) emissions scenarios[68]



Change in average temperature (°C) and average rainfall (%)in the period of March to May in Viet Nam's climate zones during 2000-2100, relative to the averages for 1980-1999, according to low (B1), medium (B2) and high (A2) emissions scenarios[69]



Change in average temperature (°C) and average rainfall (%) in the period of September to November in Viet Nam's climate zones during 2000-2100, relative to the averages for 1980-1999, according to low (B1), medium (B2) and high (A2) emissions scenarios[70]

Endnotes

[1] IPCC (2007) *Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
[2] UN Secretary General Ban Ki-Moon - to the World Federation of UN Associations, 10 August 2009
[3] IPCC (2007); UNDP (2007) *Human Development report 2007/2008. Fighting climate change: human solidarity in a divided world*, New York: Palgrave Macmillan; Dasgupta, Susmita, Benoit Laplante, Craig Meisner, David Wheeler, and Jianping Yan (2007) *The Impact of Sea Level Rise on Developing Countries: A Comparative Analysis*, World Bank Policy Research Working Paper 4136
[4] This is figure 6.6 in Nicholls, R.J., P.P. Wong, V.R. Burkett, J.O. Codignotto, J.E. Hay, R.F. McLean, S. Ragoonaden and C.D. Woodroffe (2007) Coastal systems and low-lying areas. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 315-356
[5] Stern, Nicholas (2007) *The economics of climate change - the Stern review*, report for HM Treasury, Cambridge University Press; UNDP (2007); Parry, Martin, Nigel Arnell, Pam Berry, David Dodman, Samuel Fankhauser, Chris Hope, Sari Kovats, Robert Nicholls, David Satterthwaite, Richard Tiffin, Tim Wheeler (2009) *Assessing the Costs of Adaptation to Climate Change: A Review of the UNFCCC and Other Recent Estimates*, International Institute for Environment and Development and Grantham Institute for Climate Change, London.
[6] This is figure 6 in: Yusuf, Arief Anshory, and Herminia A. Francisco (2009) *Climate Change Vulnerability Mapping for South East Asia*, Singapore: Economy and Environment Program for Southeast Asia (EEPSEA) / IDRC / CIDA / SIDA
[7] A 'low carbon economy' refers to an economy low on net GHG emissions, with the understanding that not all GHGs contain carbon but that the total is normally expressed in carbon dioxide equivalent (CO_2E) and that countries also have sinks of GHGs.
[8] WCED (1987) *Our Common Future* (World Commission on Environment and Development, also known as the Brundtland Commission)
[9] Strong action would mean that a global aim would be agreed and achieved that is consistent with recommendations of IPCC (2007) and UNDP (2007), which means that 'dangerous climate change' would be avoided and global warming would be maximum 2 ^{o}C compared to preindustrial levels, which would be possible (though not certain) if atmospheric green house gases peak at 450 parts per million (ppm) CO_2 Equivalent
[10] SRV (2003) *Viet Nam Initial National Communication under the United Nations Framework Convention on Climate Change*, Socialist Republic of Viet Nam, Ministry of Natural Resources and Environment
[11] The UN Environment Programme (UNEP) provides technical assistance to MONRE with a grant from the Global Environment Facility (GEF)
[12] This includes GEF (providing grants, for example to various energy efficiency projects in Viet Nam through UN organisations), and Climate Investment Funds (CIF), in particular the Clean Technology Fund (CTF) and the Strategic Climate Fund (SCF), with the World Bank as Trustee and in collaboration with the Multilateral Development Banks, including ADB. World Bank and ADB have started to develop loans to Viet Nam.
[13] Global climate models include 'general circulation models' (GCMs) of the global atmosphere and of oceans, sea-ice and land-ice models, and models of evapo-transpiration over land.
[14] MONRE (2009) *Climate change, sea level rise scenarios for Viet Nam*, Ministry of Natural Resources and Environment, Ha Noi, June 2009. They recommend using the B2 scenario and the resultant climate change effects for use in action planning in Viet Nam.
[15] MONRE (2009), Appendix 17
[16] Data on climatic changes and sea level are from MONRE (2009) unless otherwise indicated
[17] The effects of increased wet season rainfall on river discharge can be mitigated through afforestation and construction and good regulation of reservoirs (for irrigation and hydroelectricity generation)
[18] This is demonstrated by a model study in which 84 developing countries were compared for different levels of mean sea level rise, keeping other variables constant and assuming no measures would be taken (or in other words: the study did not compare capacities to respond to the effects of climate change): Dasgupta et al. (2007). Considering several modelled climate change effects (i.e. not just a hypothetical sea level rise, but the effects of climate change of the most likely emissions scenarios), ADB predicts that by 2100 the potential losses caused by climate change to Indonesia, the Philippines,

Thailand, and Viet Nam may be as high as $230 billion, or 6.7% of annual GDP (if no adaptation action is taken). This is well above the global average. These nations are all at risk from rising sea levels, higher temperatures, falling agricultural yields and increasingly extreme climatic events: ADB (2009) *The economics of climate change in Southeast Asia*

[19] This is the 'A1F1' scenario, which together with the A2 scenario are labelled high emissions scenarios in IPCC (2007). A2 is characterised by e.g. continuously increasing population; regionally/nationally oriented economic development; slow and fragmented technological changes; and slow increases in per capita income. Vietnamese scientists in MONRE (2009) calculated future projections of climate change for A2, B2 (medium emissions), and the B1 scenario (low emissions).

[20] MONRE (2009), following the B2 scenario, using downscaled models for the Vietnamese coast, and taking into account some melting of land ice for assessment of expected sea level rise

[21] MONRE (2009), following the A1F1 scenario, and taking into account some melting of land ice for assessment of expected sea level rise

[22] This is a draft estimate; it is not from MONRE (2009)

[23] Hugo, G. (2008). *Migration, Development and Environment*, IOM Migration Research Series, No. 35, International Organization for Migration (IOM), Geneva. Viet Nam ranks 7th among countries with the highest number of urban populations living in LECZs.

[24] The El Niño Southern Oscillation (ENSO) phenomenon contributes to seasonal climate fluctuations. It is a system of interactions between the equatorial Pacific Ocean and the atmosphere above it. El Niño and La Niña events are opposite states of the ENSO system: El Niño is when the equatorial Pacific is warmer than average and La Niña is when it is cooler than average. ENSO events tend to occur for between about 9 months to up to two years, and they generally influence climate in a consistent way. Depending on the region and season, some climate conditions are more likely to happen during El Niño events or during La Niña events than at other times, so ENSO information is used to help forecast the climate. There are suggestions that ENSO intensity and frequency may be affected by climate change, but there is no consensus on that.

Both El Niño and La Niña events affect the weather in Southeast Asia, i.e. temperature, rainfall and for example the frequency of tropical storms. In mid and late 2009 signs are that a (weak) El Niño period is developing, which would exacerbate the experience of global warming, with (temporarily) higher temperatures and droughts, and also floods and damaging storms (typhoons). El Niño is expected to have negative impact on agricultural production, which is partly based on the experience of the El Niño of 1991-92 that contributed to famine in Southern Africa, and of 1998 that caused billions of dollars worth of damage from drought to crops and forest fires, and flooding in Asia and elsewhere (1998 was the hottest year on record, globally). The current El Niño is expected to at least continue evolving until early 2010, and normally the maximum El Niño strength is in the period December to February. 2009 has already been marked by unusual weather patterns in Asia including major floods, extremely strong typhoons (hitting the Philippines, Viet Nam and others) and droughts.

[25] MONRE (2009)

[26] One of the globally accepted definitions was agreed as Principle #15 of the 'Rio Declaration' in 1992: '*In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation*.'

[27] From: UN & Oxfam (2009) (forthcoming) *Responding to climate change in Viet Nam: opportunities for improving gender equality*. The UNFCCC defines vulnerability as a systems' property: *The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity*.

[28] UNFCCC defines adaptation as: *Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities*

[29] Picture by Nguyen Thi Hoang Yen (Oxfam GB in Viet Nam), Tu Mo Rong 12 October 2009.

[30] Koos Neefjes (2002). *Lessons from the floods, voices of the people, local authorities, and disaster management agencies from the Mekong Delta in Viet Nam*. Paper for the Viet Nam Red Cross (VNRC) and the International Federation of Red Cross and Red Crescent Societies (IFRC)

[31] This is documented in UN & Oxfam (2009) (forthcoming). In addition, UNICEF with the Ministry of Labour, war Invalids and Social Affairs (MOLISA) and provincial partners have embarked on consultations with and training of youth regarding climate change through 2009.

[32] UN-Viet Nam (2009) *Gender and Climate Change in Viet Nam – a Desk Review,* lead author: Tran Thi Van Anh, Ha Noi

[33] Photos by Phan Duc Thang, UNDP-Viet Nam
[34] Land use change includes conversion of forests to agriculture or urban areas, etc.
[35] SRV (2003) *Viet Nam Initial Communication under the United Nations Framework Convention on Climate Change*, Table 2.28. The forthcoming Second Communication will improve on those data projections.
[36] UNDP Viet Nam\2006\Dien Dam
[37] For example with support from the governments of Norway and France to the Department of Geology and Minerals in MONRE (personal communication with officials, 2009)
[38] SRV (2003)
[39] SRV (2008) *Decision 158/2008/QD-TTg on approval of the National Target Program to Respond to Climate Change,* Socialist Republic of Viet Nam, signed by the Prime Minister, 2 December 2008
[40] Viet Nam has a National Target Programme (NTP) on energy saving and energy efficiency, and the PM approved the national disaster mitigation strategy in 2007. An NTP on water resources is under development and several other NTPs already exist, notably on water supply and sanitation and on poverty reduction. These are all of immediate relevance to the effects and causes of climate change.
[41] This is also known as 'no regret' investments – whatever the medium to long term effects of climate change turn out to be, future assessment would judge them to have been worthwhile, partly for other than climate change reasons
[42] See: UN-Viet Nam (2009) and UN & Oxfam (2009) (forthcoming)
[43] Quotes from UNFCCC (1992)
[44] MONRE (2009).
[45] As explained earlier, Viet Nam and other countries need to follow the precautionary principle or approach, per the Rio Declaration.
[46] UN-Viet Nam (2009) and UN & Oxfam (2009), forthcoming.
[47] UNICEF Viet Nam\2008\Truong Viet Hung, this photo was taken in Dong Thap, Viet Nam
[48] See: IFRC and VNRC (2002) *Lessons from the floods, voices from the people: local authority and disaster management agencies from the Mekong Delta in Viet Nam.* Main author: Koos Neefjes
[49] Presentation by Jeremy Bird, Mekong River Commission Secretariat: (12 November 2009, Can Tho) *Mekong Climate Change and Adaptation Initiative and the Mekong River Commission*
[50] UN & Oxfam in Viet Nam (2009) *Responding to climate change in Viet Nam: Opportunities for improving gender equality - A policy discussion paper.*
[51] Similar points were made in a lecture by Kandeh Yumkella, UNIDO Director General, on 7 September 2009 in Ha Noi.
[52] IUCN\2005\Nguyen Thi Bich Hue. This photo was taken in Tram Chim National Park, Dong Thap, Viet Nam
[53] The Norwegian Government is supporting this through the UN-REDD project, which is a collaboration between MARD and UNDP, FAO and UNEP – operationalised in 2009.
[54] SRI aims to reduce production of methane from rice fields through changes in tillage and water management. See e.g. UN & Oxfam (2009), forthcoming.
[55] Particularly strong benefits of organic farming in the emissions context include the avoidance of fertilizers which are associated with the release of nitrous oxide, a potent GHG, and increases in the organic material content of soils - meaning that it helps store 'carbon'. However, the latter benefit is also important in other approaches to 'sustainable agriculture'.
[56] See e.g.: Stern (2007) UNDP (2007); Parry et al. (2009).
[57] Including the CTF and the SCF, mentioned earlier.
[58] More information is provided on REDD financing in Section VIII.
[59] For example, Denmark is funding the NTP-RCC, and the Japanese Government (JICA) with France (AFD) are currently preparing general budget support to Viet Nam with a focus on climate change through the Support Program to Respond to Climate Change (SP-RCC).
[60] A key example in the climate change context of receiving international finance through a Trust Fund is Bangladesh, which is supported by the UN in this regard. Generally, through climate change Multi-Donor Trust Funds (MDTFs) the UN can deliver direct access to funds for developing countries through a simple, single framework. Its multilateral nature also offers an equitable, transparent and efficient governance system. As this would be focused on technical assistance and grant aid, it can help countries attract the large scale investments needed – thus complementing and enhancing the effectiveness of financing and support provided by, notably the Multilateral Banks.
[61] There is, for example, experience in supporting small and medium enterprises in the brick making sector through a UNDP-GEF project in the Ministry of Science and Technology, which works with the Viet Nam Bank for Industry and Trade.

[62] UNDP and ADB are currently preparing a GEF project on climate proofing of medium scale infrastructure, with MARD and others.
[63] UNFCCC (1992)
[64] UNFCCC (1992)
[65] Unless higher peak discharges from heavier wet season rains are mitigated by, for example, afforestation in upstream areas and dam building. These actions could regulate the water flow but dams also have several social and environmental disadvantages.
[66] Quotes from UNFCCC (1992), Article 3.2: '…The specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change, and of those Parties, especially developing country Parties, that would have to bear a disproportionate or abnormal burden under the Convention, should be given full consideration …'. See also Article 4.4 of the UNFCCC.
[67] Article 11.5 of the UNFCCC provides room for bilateral and multilateral funding for climate change outside the UNFCCC financing mechanism which is 'related to the implementation of the Convention'.
[68] Appendix 5 in MONRE (2009)
[69] Appendix 2 in MONRE (2009)
[70] Appendix 4 in MONRE (2009)