CLIMATE CHANGE IN VIETNAM: ASSESSMENT of ISSUES AND OPTIONS FOR USAID FUNDING

Prepared For USAID / Vietnam

Prepared by the US Forest Service

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USAID
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List of Acronyms

AIT	Asian Institute of Technology
AusAID	Australian Agency for International Development
CTU	Can Tho University
DANIDA	Danish International Development Agency
DRAGON	Delta Research and Global Observation Network
EPA	Environmental Protection Agency (US)
FCPF	Forest Carbon Partnership Facility
FLEGT	Forest Law Enforcement Governance and Trade
FORMIS	Forest Sector Monitoring Information System
FSSP	Forest Sector Support Partnership
GE	General Electric
GHG	Green House Gases
GVN	Government of Vietnam
IEC	Information, Education and Communication
IPCC	Intergovernmental Panel on Climate Change
JICA	Japan International Cooperation Agency
LEDS	Low Emission Development Strategies
LMI	Lower Mekong Initiative
MARD	Ministry of Agriculture and Rural Development
MOIT	Ministry of Industry and Trade
MONRE	Ministry of Natural Resources and Environment
MOST	Ministry of Science and Technology
MPI	Ministry of Planning and Investment

MRV	Measurement Reporting and Verification
NOAA	National Oceanic and Atmospheric Administration (US)
NGO	Non-Governmental Organization
NTP	National Target Plan
NTP-RCC	National Target Plan to Respond to Climate Change
PES	Payment for Environmental Services
RDMA	Regional Development Mission for Asia (USAID)
RECOFTC	The Center for People and Forests
REDD	Reducing Emissions from Deforestation and Forest Degradation
REF	Reference Emissions Levels
SANREM	Sustainable Agriculture and Natural Resource Management
SLR	Sea level rise
SP-RCC	Support Program to Respond to Climate Change
SNV	Netherlands Development Organization
TFF	Trust Fund for Forests
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
USAID	United States Agency for International Development
USFS	United States Forest Service
USG	United States Government
USGS	United States Geological Survey

CHAPTER 1 – INTRODUCTION AND CONTEXT

Introduction

This report summarizes the findings and recommendations of a Climate Change Assessment for Vietnam funded by the United States Agency for International Development (USAID). During the latest round of discussions on Climate Change in Cancun, the international community again voiced their support for the Copenhagen Accord resulting from the Copenhagen climate talks, and noted their commitment to pursue low carbon development and to make significant progress in reducing the emissions of Green House Gases (GHG), with particular attention to curbing emissions from deforestation and forest degradation through the provision of increased, positive incentives and support for sustainable management of forests and enhancement of forest stocks. In keeping with these agreed upon provisions for donor countries to provide climate change related funding to some of the most affected countries, the United States Government (USG) is moving ahead with the preparation of additional bilateral development assistance to support Vietnam's effort to respond to climate change.

This USAID funded climate change assessment was organized with the technical support of the U.S. Forest Service and interested partners in Vietnam, including the Ministry of Agriculture and Rural Development (MARD), the Ministry of Natural Resources and Environment (MONRE) and others. The assessment aims to provide an analysis of major opportunities and challenges related to climate change in Vietnam that could be useful to USAID as it makes strategic programming decisions for new bilateral assistance in the areas of climate change "adaptation" and "sustainable landscapes". Another multi-agency mission of the US Government is also preparing an assessment of the needs and opportunities for assisting Vietnam with the preparation of a Low Emissions Development Strategy (LEDS), with a focus on clean energy and mitigation of carbon emissions.

This adaptation and sustainable landscape assessment report includes information on the main issues and challenges related to climate change in Vietnam as well as the major government priorities, donor investments and action plans developed to address climate change. This document summarizes key strategies that the Government of Vietnam (GVN) currently has in place which outline a set of needed interventions to respond to climate change, with a focus on reducing vulnerability to climate change and promoting landscape level mitigation of emissions. The recommendations of the assessment team include suggestions for broad, potential areas of support to the government of Vietnam in the areas of climate change adaptation and reduced deforestation and degradation and / or increased forest carbon stocks. These potential interventions are refined and localized to some extent based on the outcome of meetings with water resources agencies and NGOs. Finally, potential synergies with other USG activities are reviewed. The assessment is intended to set the stage for a more in-depth project design effort that will be organized by USAID/Vietnam in 2011.

Assessment Organization and Process

The USAID/Vietnam Climate Change assessment was organized in the context of a multi-agency approach to address climate change, taking into account the recently completed and ongoing and planned work of the U.S. Geological Survey (USGS), the National Oceanic and Atmospheric Administration (NOAA), the U.S. Environmental Protection Agency (EPA), the U.S. Forest Service and other U.S. government agencies along with USAID. A number of these agencies have been collaborating in a recent initiative to support the preparation of national Low Emission Development Strategies (LEDS) in targeted countries, including Vietnam. This new climate change program to be funded by USAID will take account of the emerging LEDS planning and analysis, as well as relevant USAID regionally funded programs managed through USAID's Regional Development Mission for Asia (RDMA with offices in Bangkok). It will also fit within the recently developed Mission Strategy for USAID/Vietnam, which includes a specific focus on "Improved Environment Management" with targeted results for strengthening responses to climate change, improved water resources management, enhanced biodiversity conservation and more effective control of environmental pollution.

The assessment team included a team leader, US Forest Service coordinator, forest hydrologist and forest inventory specialist and benefitted from the participation of the USAID RDMA regional environmental specialist, USFS disaster management specialist and the program staff of USAID/Vietnam, the US Embassy in Vietnam and concerned Government of Vietnam agencies. (For additional details, see Annex A).

The assessment findings are based on consultations and field visits carried out during a two month period, in November to December, 2010. During this time, the team interviewed government officials and technical specialists, representations of donor agencies, NGOs, project teams and the private sector in Hanoi and Ho Chi Minh City. The team also visited a number of mangrove forest and restoration sites, household biogas installations, a participatory watershed management project, bamboo plantations and associated field interventions in several communes in the coastal and upland areas of Thanh Hoa District. The team hydrologist also visited a number of locations where sea/river dykes were proposed for upgrades, along with areas proposed for tide gates to limit salt water intrusion in Tien Giang Province.

At the outset of the assessment process, the team coordinated closely with the related LEDS pre-scoping mission and national scoping mission and associated round table meetings. During the course of four weeks of consultative meetings in November and December 2010, the assessment team posed a number of critical questions concerning climate change issues and priority interventions, and gathered information about ongoing or planned assistance related to these issues and interventions, from the perspective of senior staff of the central government, local officials and rural communities.

At the conclusion of the in-country consultative meetings and field visits, on December 17, 2010 in Hanoi, a Round Table was jointly organized by MARD and USAID with key stakeholders to discuss the preliminary findings and recommendations of the assessment team. During the preparation of the report, the team also consulted with key persons involved with US government initiatives in Vietnam, including the work of the U.S.-Vietnam Climate Change Working Group, the Lower Mekong Initiative (LMI), the Dragon Institute and Forecast Mekong (USGS), and the climate change adaptation training, coastal zone management capacity building and related technical support provided by NOAA. (For additional details, see Annex B).

CHAPTER 2 – CLIMATE CHANGE VULNERABILITY AND CHALLENGES

There are many documents available that provide an in-depth review of the actual and anticipated impacts of climate change in Vietnam, including the various national communications prepared in connection with the work of the UNFCCC , the National Target Plan to Respond to Climate Change (NTP-RCC) drafted in December 2007 with the leadership of the Ministry of Natural Resources and Environment (MONRE), and the Climate Change Action Plan prepared by the Ministry of Agriculture and Rural Development (MARD). While MONRE has a leadership role with the development and implementation of the NTP-RCC and associated action plans, and MARD is a key institution for the technical support of landscape level interventions in agriculture, water resources development, forestry and rural development including landscape level adaption to climate change and reduction of emissions, a number of other Ministries and the Provincial People's Committees are also engaged in the preparation of climate change related assessments, strategies and Action Plans. From these different reports and other documents, including a small sampling of the many studies generated by hundreds of completed and ongoing interventions in Vietnam designed to address climate change, a few key points can be summarized as follows:

- Vietnam is widely cited as one of the five countries in the world most vulnerable to climate change, because of high population density in lowland river deltas and coastal areas as well as its long coastline and geographic position in relation to cyclones; Vietnam's impressive accomplishments in poverty reduction are likely to be seriously jeopardized by climate change
- Over the past 50 years, sea level rise (SLR) has amounted to 20 cm and a sea level rise of 100 cm is projected by 2100; a sea level rise of this magnitude would directly affect at least 10% of Vietnam's population; a sea level rise of up to 3 meters, affecting 25% of the population, is possible under some scenarios
- The frequency and severity of typhoons and other severe storms has increased and is likely to increase further , with associated storm surges, salt water intrusion, flooding, landslides and damage to coastal infrastructure
- Rainfall patterns are being disrupted and become more variable with abnormally heavy rainfall in the monsoon season and less rainfall in the dry season; in many instances, stream flows in the flood period have increased and decreased in the dry season; droughts have become a recurrent problem; by the year 2100, Vietnam expects an increase in total rainfall but a decrease in dry season rainfall
- In the past 50 years, average temperatures have increased 0.7 degrees C and further increases are likely, along with periods of abnormally hot weather as well as abnormally cold weather in January-February; by 2100, models predict an average temperature increase of 2.3 degrees C
- The combination of SLR, salt water intrusion, variability in rainfall and temperature, droughts and corresponding effects on water supply and salinity is disrupting and negatively impacting

crop production, aquaculture and fisheries; the winter crop season in the north is likely to be shortened or eliminated

- Changing weather patterns and climate conditions could increase the threats from crop pests and diseases and have adverse impacts on human health, in combination with disrupted supplies of food and water

The combined impact of these changes associated with climate change are significant and likely to be increasingly severe in terms of diminished crop production and food security, disrupted and reduced water supplies, increased risks of forest fires, negatively impacted hydropower production and energy security, destruction of infrastructure and displacement of coastal communities as well as negative impacts on transportation and industrial infrastructure. (See also Chapter 4.)

The poorest households are the most vulnerable to these climate change impacts, including those directly dependent on agriculture, fisheries and forests. The regions most affected by climate change include the coastal zone, the Red River and Mekong Deltas, and the mountainous areas of the north and north central regions. The sectors that are most sensitive to the negative impacts of climate change are water resources, agriculture and food production and marine and coastal developments.

Despite these negative impacts and threats from climate change, it is also important to note that in the past twenty years, after a period of deforestation and gradual reduction in the area of forested land, as a result of concerted efforts by the government and the promotion of reforestation, Vietnam has reported an increase in the percentage of land with a forest cover (see also Chapter 5) With a clear commitment by the country's leadership and substantial resources from the international development organizations, Vietnam has emerged as one of the first countries to make significant progress in becoming ready to move ahead with the implementation of payment schemes in support of "REDD" – Reduced Emissions from Deforestation and Degradation .

Government of Vietnam Climate Change Strategies and Related Programs

The Government of Vietnam has recognized a wide range of development issues and challenges that are likely to be impacted by climate change. In addition to formulating the National Target Plan to Respond to Climate Change (NTP-RCC), the development plans for a number of other sectors have been formulated or are being updated by a number of concerned ministries and departments to take account of climate change in association with plans to development the sectors and to conserve natural resources. This includes poverty reduction, water resources, agriculture and rural development, forestry, energy and others. These various national target plans and strategies include a long list of priority interventions and proposed programs.

National Target Plan to Respond to Climate Change

The stated strategic objectives of the National Target Plan to Respond to Climate Change (NTP-RCC) are to assess climate change's impacts and develop feasible action plans to effectively respond in both the short and long-term to ensure sustainable development. This NTP also notes the need to take advantage of opportunities to develop a low carbon economy and to join international efforts to mitigate climate change. The plan aims to be comprehensive through a consideration of impacts on all aspects of life

from water resources and forestry to energy, transportation, industry, human health and culture. The Main Activities outlined in the plan could be viewed as a compilation of activities related to climate change adaptation. Despite the objective of focusing on the issue of climate change in a manner which serves to prioritize needed actions, the NTP-RCC is more of a "strategy to develop a strategy" and it includes many generalized activities rather than a short listing of specific priorities to reduce vulnerabilities of the most affected populations, manage the most significant risks and adapt to the key hazards and threats associated with climate change, while mitigating the most important sources of GHG emissions.

The plan includes near term (to 2010) and longer term (to 2015) priority activities to address 8 sub-objectives or program areas:

1. assessing the impacts of climate change
2. identifying appropriate responses
3. developing a scientific-technical program
4. strengthening capacity and the policy framework in the relevant organizations and institutions
5. raising awareness across the country
6. enhancing international cooperation
7. mainstreaming the NTP across all sectors
8. developing specific action plans to respond to climate change

The NTP-RCC does include sections dealing with the effects of climate change, the organization and phasing of the implementation of actions designed to respond to climate change, financing and provisions for monitoring and evaluation. The annexes also include lists of priority projects that address general needs for adaptation, improved water resources management and further increases in the forest cover. The NTP outlines a need to fully develop and improve the management of 16.2 million ha of forest land, and to utilize bare land and increase the forest cover from 42% in 2010 to 47% in 2020. Another area of concern is maintaining and developing technical capacity of the water resource professionals to forecast climate changes and effects, plan and design adaptation strategies, as well as help develop and improve national policy related to water resources use and protection. Specific key activities presented in the context of action plans include upgrading the sea and river dyke systems to enhance the structural stability and the level of flood protection, comprehensive water resource planning by river basin, and continued research on restoration and protection of coastal mangroves, wetlands and coral reefs.

MARD Action Plan Framework for Adaptation to Climate Change in the Agriculture and Rural Development Sector for the period 2008-2020

In keeping with the orientation of the NTP-RCC, MARD prepared an action plan in September 2008 to provide a framework for adaptation to climate change in the agriculture and rural development sector. The specific aim of the MARD Action Plan is to minimize the adverse impacts of climate change and to ensure the sustainable development of the agriculture and rural development sector. The action plan specifically targets interventions to ensure the safety of rural communities and to support disaster prevention, and to maintain coastal dykes and infrastructure to ensure stable agricultural production

and food security. The prescribed activities largely follow the orientations of the NTP, and include communication and information dissemination, development of human resources, organization of scientific studies, development of policies to integrate attention to climate change in sectoral development, and a series of research and planning interventions.

Vietnam Forestry Development Strategy 2006-2020

In February 2007, the Vietnam Forestry Development Strategy was approved by the Prime Minister. This strategy outlines goals and objectives to the year 2020 for the allocation, use and improved management of forest lands in the context of supporting economic development, providing employment and environmental stability. Forests lands are allocated to production, protection and special use, and orientations are provided for the management of each category of forest land, along with a number of "solutions" or policy orientations, program tasks and funding to implement the strategy. The strategy was prepared in advance of the NTP, REDD program and does not include many specific references to climate change, although the proposed interventions are focused on the improved management and conservation of forests which is fundamental to addressing climate change. Estimated budget requirements for 2006-2010 amounted to 33,885 billion VND or $1.7 billion, including support for sustainable forest management; forest protection, biodiversity conservation and development of environmental services; timber and forest products development; research, education and training; and institutional, policy and planning.

Vietnam's National REDD+ Program and Plans

The UN REDD website provides a clear statement of the context for the development of the national REDD+ program for Vietnam. (See http://www.un-redd.org/AboutREDD/tabid/582/Default.aspx)

Deforestation and forest degradation, through agricultural expansion, conversion to pastureland, infrastructure development, destructive logging, fires etc., account for nearly 20% of global greenhouse gas emissions, more than the entire global transportation sector and second only to the energy sector. It is now clear that in order to constrain the impacts of climate change within limits that society will reasonably be able to tolerate, the global average temperatures must be stabilized within two degrees Celsius. This will be practically impossible to achieve without reducing emissions from the forest sector, in addition to other mitigation actions.

Reducing Emissions from Deforestation and Forest Degradation (REDD) is an effort to create a financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development. "REDD+" goes beyond deforestation and forest degradation, and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.

It is predicted that financial flows for greenhouse gas emission reductions from REDD+ could reach up to US$30 billion a year. This significant North-South flow of funds could reward a meaningful reduction of carbon emissions and could also support new, pro-poor development, help conserve biodiversity and secure vital ecosystem services.

In December 2010, the National REDD Focal Point framed the context and outlined the considerable progress achieved in recent months with the implementation of REDD+ activities in Vietnam. Despite a reported increase in the total percentage of forest cover in Vietnam (rising from 27% in 1990 to 39% in 2009), the program has taken note of continued severe deforestation in the central highlands and southern provinces. There have been significant emissions from the conversion of forests to agricultural land and especially from the loss of mangrove forests converted to shrimp farm. Unsustainable logging and the rapid growth of Vietnam's wood processing industry, coupled with insufficient capacity in forest management and forest law enforcement is also adding to the pressures of deforestation and forest degradation. Major driving forces behind these forest changes include the slow pace of forest allocation and weak forest land tenure, the high opportunity costs of converting forest to agricultural cash crops and the market demand for wood from forest plantations, as well as weaknesses in technical capacities, forest governance and institutional arrangements and policies for the implementation of REDD+ activities.[1]

Over the past year, funding was mobilized through UN REDD for awareness raising and capacity building, and key documents were prepared to enable progress under the framework of the Forest Carbon Partnership Facility. A National REDD network was established, a website developed, progress made with development of a forest database and interim reference emission levels (REL). An official decree on payment for forest environmental services (PFES) was adopted and support is being provided to scale up PFES and to integrate REDD+ in land use planning in pilot provinces. A benefit sharing study has been completed and a national REDD program is under preparation with support from FCPF and the UN REDD program which was officially launched in August, 2009. In the coming months, the next phase of support for the implementation of a national REDD+ program in Vietnam will include activities to strengthen the national REDD Network, to establish a National REDD+ Office and Multi-sectoral Steering Committee, along with further capacity building and strengthening of technical capacities in measurement, reporting and validation (MRV) and in the launching of REDD+ field demonstrations.

Draft National Target Plan for Improving Water Resources Use and Protection

The draft plan, as summarized by USAID (2010), recognizes several primary urgent issues to be addressed: Water scarcity from growing upstream use and climate impacts, unsustainable water use, water pollution and degradation resulting in reduced availability and declining quality of life, lack of integrated management of water, land, and ecosystems, and poor water resources management that affects Millennium Development Goals for water and sanitation and poverty reduction. The corresponding major program objectives are legal and policy reform, security of trans-boundary water resources, improved integrated water resource management, water resources protection, improved data and information systems, and technical capacity building for water resources management.

National Target Plan for Rural Water Supply and Sanitation

[1] See presentation on REDD+ Implementation in Vietnam by Dr. Manh Cuong, National REDD Focal Point, prepared for the First Donors Roundtable Meeting convened Dec 14, 2010 in Hanoi.

The government of Vietnam has been working to improve the quality and quantity of potable water and to address the lack of treatment of waste water from industry, medical facilities, domestic sewage, and livestock husbandry. Consequently, the NTP identified three major program activities: Construction of clean water supply facilities in combination with an information, education, and communication plan (IEC) on clean water, construction of sanitary latrines in households, schools and medical clinics in combination with IEC on sanitation and personal hygiene, and treatment of wastes from trade villages and livestock farms. While climate change is not specifically addressed in this NTP, the problems of clean water supply and waste water treatment will undoubtedly be exacerbated by anticipated effects of a changing climate across the country so implementing the activities of the NTP for Rural Water Supply and Sanitation should remain a priority.

National Water Resources Strategy towards the Year 2020

This strategy sets out comprehensive guiding principles, objectives, missions and implementation measures regarding the protection, exploitation, use and development of water resources, as well as the prevention and mitigation of impacts caused by water (floods and drought).

While the Strategy was not written as a response to climate change, there is recognition that a changing climate will likely affect the objectives identified. The following points summarize the objectives from the Strategy. *Protection of water resources* includes protection, restoration, and efficient use of rivers, reservoirs, aquifers and wetlands, many of which have been degraded and depleted. Ensuring the provision for ecological flows for maintaining aquatic ecosystems; eliminating unlawful use of water and discharges of wastewater, including control of source pollutants such as chemicals used in aquaculture and agriculture. *Exploitation and use of water resources* essentially addresses the efficient and economical use of water resources along with provisions for fair allocation and sharing among users. *Water resources development* includes insuring the safety of existing dams, while planning the construction of multi-purpose (flood prevention, drought mitigation, irrigation, etc.) water projects and groundwater supplementation projects. *Mitigation of adverse impacts caused by water* includes minimizing flood damage and loss of life; strengthening the sea dyke and river dyke systems (particularly the Red-Thai Binh), and improving flash flood monitoring and warning capabilities in the mountainous provinces; ensuring the safety and adaptability for residents in low-lying areas (particularly the Mekong delta); and ensuring development plans and standards are consistent with flood control criteria. Finally, *Enhancing regulatory and institutional capacity in water resources management* would ensure a comprehensive legal system in the field of water resources that supports sustainable development, including the necessary management institutions, as well as science and technology capacity building.

National Target Plan on Energy Efficiency

Although outside the scope of work of this assessment, the team also learned about the preparation of a NTP on Energy Efficiency and associated Action Plan prepared by the Ministry of Industry and Trade (MOIT). This NTP and Action Plan focus on ramping up training for energy audits, and the mitigation of energy related emissions through improved energy efficiency. The Ministry of Planning and Investment (MPI) is also taking the lead in the analysis of possible low carbon development pathways and low emissions development strategies (for more information, see LEDS report)

Current Institutional and Capacity Building Efforts

Climate Change Assessment and Planning

In 2003, the Ministry of Natural Resources and Environment (MONRE) was designated by the Prime Minister to assume the lead and to serve as the focal point for actions related to climate change, including the coordination of the formulation of the NTP to respond to Climate Change. A primary objective of the NTP-RCC is to promote and support the "mainstreaming" of responses to climate change in the various sectoral development plans which are implemented by other ministries and the provinces. MONRE also has responsibility for policies related to overall land use planning and allocation of land to different uses. MONRE includes a number of specialized institutes that are responsible for the collection and analysis of climate change related data, and these institutes are playing a leading role in the US Vietnam Climate Change Working Group, and in the preparation of climate change vulnerability assessments and in modeling climate change scenarios.

MONRE is also the primary beneficiary of significant budgetary support provided to the GVN for the NTP-RCC and related environmental programs by DANIDA. This budgetary support includes significant funding earmarked to support the Provinces in responding to severe storms, flooding, sea level rise, salt water intrusion and associated climate change adaptation activities. In addition to budgetary support from DANIDA, the Support Program to Respond to Climate Change (SP-RCC) provides major funding for climate change programs mobilized by the World Bank, JICA, AFD and CIDA. The SP-RCC works through the NTP-RCC Steering Committee chaired by the Prime Minister, and is thereby able in principle to mobilize high level political support for planning and prioritization of climate change interventions and associated policy reforms.

Following the preparation of the NTP-RCC in 2007, MONRE has been engaged in preparing scenarios for sea level rise and in the completion of an assessment of climate change trends, so that this information can be taken into account in the formulation of ministry and province action plans. According to the NTP, a consideration of climate change should be integrated into the preparation or updating of the major strategies and target plans being used to guide development in Vietnam, including:

- National Strategy on natural disaster prevention
- National strategy on hunger eradication and poverty alleviation
- National strategy on community health
- National strategy on gender equality
- National strategy on environmental protection
- National strategy on protection of water resources
- National strategy on the integrated management of coastal areas
- National strategy on agricultural development
- National strategy on forestry development
- National strategy on fishery development
- National strategy on transportation development
- National strategy on energy development
- National strategy on infrastructure development

While MONRE has an ambitious institutional mandate to lead the mainstreaming of a consideration of climate change in development planning in all sectors, and although there are large pipelines of funding for the MONRE led NTPRCC as well as a Support Program to Respond to Climate Change (SPRCC), there are evident staffing constraints and coordination challenges that have not yet been overcome. To date, progress has been uneven with respect to the preparation and implementation of sectoral, ministerial and provincial action plans within the overall framework of the NTP, and the continued push for additional planning and coordination is straining the existing manpower while many needs for effective local level implementation of practical responses go unmet.

Mainstreaming of Climate Change in Development and the Management of Natural Resources

The Ministry of Agriculture and Rural Development (MARD) has been reorganized to include the technical services leading development interventions in many of the key sectors that are highly sensitive to climate change, including water resources, crop production, forestry and fisheries. MARD has the leading role in the allocation and management of forest lands, for protection, production and special use forests, including the national network of nature reserves and protected areas. MARD is also involved with disaster assistance planning and management. In contrast to MONRE which has relatively few specialized, technical staff directly engaged in the management of natural resources, particularly at the district level, MARD has a large number of engineers, agronomists, foresters, fisheries management and other specialists working at all levels, including the provincial and district levels. They also support the implementation of sectoral development plans in agriculture, forestry and fisheries, including the MARD Action Plan and Provincial Action Plans designed to respond to the specific impacts of climate change in each sector and at the provincial level.

The Ministry of Planning and Investment (MPI) has the lead responsibility for coordinating the planning of major developments and infrastructure investments. Provincial Peoples Committee has the responsibility to prepare Climate Change Action Plans for each Province, based on the framework provided in annexes to the NTP. District level plans would presumably also be prepared to support the implementation of the Provincial Action Plans and the overall national strategies and NTP.

Climate Change Networks and supporting Working Groups

In addition to the incorporation of climate change concerns into key institutions in the Government, a number of networks and working groups have emerged to help respond to climate change in Vietnam. The US-Vietnam Climate Change Working Group was established in June, 2008 with high level support from both countries in the spirit of promoting science and technology exchanges and collaboration. Scientists from MONRE, Vietnam National University and others are working with colleagues in the US Geological Survey and other US Government agencies to monitor and assess climate change threats and to share information, organize training and build scientific capacity in Vietnam (see also Chapter 3).

As awareness has increased about climate change, NGOs working in Vietnam have responded by organizing the NGO Resource Centre - Climate Change Working Group (CCWG), with leadership by CARE International and support from the NGO Resource Centre. The CCWG was established in February 2008 to provide a forum for Vietnamese NGOs and international NGOs to actively participate in climate

change debates and to facilitate information and resource-sharing and coordination among NGOs engaged in addressing climate change. The CCWG includes a core group and four thematic groups focused on climate change adaptation, awareness and behavior change, climate change mitigation and policy. The CCWG is active and regularly meets to discuss how the members can work together to achieve the overall goal of "reducing the vulnerability of poor people in Vietnam to the impacts of climate change through NGO coordination, advocacy and capacity building for environmentally and economically sustainable and socially just responses to climate change". (See http://www.ngocentre.org.vn/ccwg)

To support the development of a national program for Reduced Emissions from Deforestation and Degradation (REDD), an extensive REDD network was officially organized in September 2009 as a multi-partner team to support the development of REDD Readiness in Vietnam to address climate change mitigation and adaptation. The REDD network and the preparation and implementation of a national REDD+ program are benefitting from significant funding and technical support from Norway, the UNDP/ UN REDD program, the World Bank Forest Carbon Partnership Facility, FAO, UNEP, GTZ, JICA, FINNIDA and others. The REDD Network includes more than 40 representatives of concerned Government ministries and technical departments, international development partners, NGOs and development projects, and has a technical working group and several sub-technical working groups (MRV, Governance, Benefit Distribution, Local implementation…) to support the operationalization of REDD+ in Vietnam.

Earlier in 2010, in meetings convened with the participation of the Forest Sector Support Partnership (FSSP) and others, a number of suggestions were made to improve the functionality of the REDD Network and to support improved coordination and information sharing. More recently, on Dec 14, 2010 at a round table meeting with donors on REDD, a number of proposals were presented to strengthen the management and coordination arrangements for the operationalization of REDD+ in Vietnam, including the establishment of a Programme Executive Board, a Programme Management Unit and Advisory Bodies. The combination of the REDD Network and the FSSP along with the emergence of a strengthened institutional structure for the management of the National REDD+ Program, including a REDD Fund, should enable Vietnam to capitalize on global commitments to REDD+ and to make rapid progress with an ambitious suite of activities designed to operationalize REDD+ in Vietnam.

Major areas of climate change assistance from international partners

As apparent from the discussion of National Target Plans, strategies and Action Plans, the Government of Vietnam has identified a wide range of activities to be implemented in response to climate change. Many aid agencies and NGOs in addition to the private sector are engaged in funding these and other climate change related interventions in Vietnam. While this assessment does not attempt to provide an exhaustive and complete listing of these activities and interventions, it would be useful for the follow on project design team to carefully review the Matrix of climate change interventions compiled by UNDP, as well as the tables and listings developed by various networks and working groups to take stock of the most relevant types of interventions already being supported in relation to the areas targeted by USAID for additional assistance. The following provides a brief overview of some of the major areas of

assistance being provided in the areas most relevant to this assessment of needs and opportunities for climate change adaptation and "sustainable landscape" investments.

Development Assistance Agencies

AusAid: support for mangrove restoration and water resources management in the Mekong Delta; a new bilateral climate change program is also under preparation.

Denmark / DANIDA: targeted budget support for the NTP-RCC ($40 million) in concert with SP-RCC donors, including 66% of funding earmarked for provinces to assist with adaptation, and responses to typhoon damage, sea level rise and salt water intrusion; $50 million for major Environmental Program (2005-2012) with 5 Ministries including capacity building with MPI, pollution control in poor urban areas with MONRE, clean industrial production with MIT, sustainable development in urban areas with Ministry of Construction and sustainable livelihoods in marine Protected Areas with MARD.

Finland: analysis of forest conditions in 3 provinces; support for improved use and management of forest inventory data (FORMIS)

GTZ: pilot application of PFES; mangrove restoration pilots; support for forest management; FSSP/VFDS and REDD

JICA: major funding together with World Bank, AFD, CIDA of loans linked to policy reform for climate change responses (SP-RCC); Greenhouse Gas inventories; assistance with analysis of national forest cover and forest inventories; assistance to forest enterprises

Netherlands: along with ADB and World Bank, major support for water resources management in the Mekong Delta

Norway: $4.5 million for first phase of UN REDD and $100 million committed for REDD+ payments, in cooperation with UN REDD, UNDP, FAO, World Bank / FCPF and others

USG and USAID (For details, see Chapter 3)

Non-Governmental Organizations

CARE: participatory watershed management, mangrove restoration, improved forest governance and community forestry linked to poverty reduction; support for Climate Change Working Group

Flora Fauna International: development of REDD+ proposal targeting Protected Areas

Forest Trends: research and analysis of social dimensions and equity issues in PFES, REDD, FLEG/T, Lacey Act, illegal logging and leakage, biodiversity offsets, equitable benefit sharing agreements for REDD+

General Electric Foundation: support for a workshop on Low Carbon Development organized in Hanoi in November 2010; interest in sponsoring long term university training for masters in environmental sciences

GRET: support for bamboo plantation, management, value added processing, biogas, integrated rural development

PanNature: community participation and co-management of Protected Areas (with support from FFI, EU, Ford Foundation, others) including policies to support conservation payments for local collaboration in protection of parks and reserves;

RECOFTC: forest tenure and rights, linkages with poverty reduction and forest governance, training on REDD and climate change adaptation; collaboration on benefit distribution systems for REDD+

SNV – major assistance for national program to promote household biogas plants; assistance for planning and implementation of REDD+

USAID/RDMA through Winrock: support for PFES decree and pilot; PPP to develop bamboo and other crops; policy and capacity building; preparation of mangrove restoration action plan (in concert with GTZ and others)

WWF: survey of impact of climate change on Mekong River; support for biodiversity conservation; analysis of impacts of proposed dams on the Mekong; support for improved and sustainable forest management (with JICA, GTZ and industries) including adoption of chain of custody agreements, promotion of FSC certification

Capacity Building Initiatives and Opportunities

As an integral part of the first phase of REDD and a range of other development assistance activities that are relevant to needed responses to climate change , much attention has been given to capacity building. For example, the NGO CCWG regularly sponsors training in subjects related to climate change assessment and awareness-raising, and the US-Vietnam Climate Change Working Group has sponsored workshops and exchange visits as part of their capacity building efforts. During the course of the assessment, the team also met with a number of institutions that are taking the initiative to develop training programs in climate change, and otherwise participating in developing capacities to respond to climate change.

Can Tho University and Vietnam National University

Can Tho University and VNU have emerged as the primary university partners of the Forecast Mekong and other activities of the USGS. These universities are especially well positioned to develop their capacity to manage the large databases required for modeling and visualization of the simulated impacts of dames on the Mekong River and other water resources management challenges in relation to sea level rise and other climate change impacts. In addition, the GVN has specifically requested that the US cooperate on climate change education through CTU.

Nong Lam University – Research Centre for Climate Change

As one of the major universities in Vietnam with a focus on the role of improved natural resources management and conservation in economic development, Nong Lam University is cooperating with many countries and international organizations, including dozens of US universities. For example, they are working with North Carolina Agricultural and Technical State University within the framework of the

USAID funded Sustainable Agriculture and National Resource Management (SANREM) cooperative research support program to promote improved soil and water conservation techniques. This type of research can have a major impact on improving the resiliency of crop production systems, through the improved management of soil organic matter with its associated moisture holding capacity and soil fertility benefits which become particularly valuable and important during periods of drought. With Faculties in Agronomy, Forestry, Fisheries, Engineering and Environmental Technology, in 2009, they took the initiative to organize a Research Centre for Climate Change, to mobilize support and to develop further university curricula, short courses and research activities related to climate change adaptation, vulnerability assessments, as well as sustainable farming systems and community based natural resource management. See http://www.hcmuaf.edu.vn/index.php?lng=en&ur=admin

Asian Institute of Technology in Vietnam

AIT-VN is affiliated with the main campus and programs of AIT – Bangkok Thailand which was founded with US assistance in 1959. AIT-VN was established 18 years ago to provide training and outreach in development, environment and other areas. AIT programs are funded through intergovernmental relationships and grants as well as tuition payments. The Director of AIT-VN is Amrit Bart, a specialist in aquaculture and a graduate of Auburn University. AIT has three major Schools offering educational degrees (PhD, Masters, PhD, post grad) training and capacity building short courses on 40 fields of study related to Technology and Engineering, Environmental Resources and Development, and Management. Some 1600-1700 students are enrolled each year in Thailand, and about 300 students in AIT-VN including degrees in environmental engineering, construction management, energy economic planning, development studies; a number of faculty are specialized in energy efficient building design. In Vietnam, the main campus is in Ho Chi Minh City and will be expanding to offer 150-200 courses / year, depending on demand. See http://www.aitcv.ac.vn/fo/shortcourse_detail.php?ID=301&srch=

Considerable scope for partnership with NREL, EPA, DOE and others on LEDS related training and capacity building. AIT is aware that most research on climate change has been related to modeling of scenarios of anticipated climate change impacts (sea level rise, changes in rainfall, temperature); more research is needed on LEDS, alternatives for mitigation and adaptation, assessment of actual impacts. Furthermore, most training related to climate change has been focused on an orientation to basic definitions, concepts for a limited number of agency and organization heads responsible for CC strategies and plans. AIT is working to deepen and improve CC related training, and they have developed courses to present tools to assess CC impacts and to support adaptation planning.

With funding from UNDP, AIT-VN has worked with MONRE to carry out a training needs assessment (questionnaires sent to 65 provinces) to orient preparation of Technical Guidelines on CC Impact Assessment and Identification of Adaptation Measures. TNA showed that Provincial authorities have a mandate and funding based on NTP but no capacity to prepare Provincial Action Plans. Guidelines are being prepared (in Vietnamese) and will be used in 2011 in training programs for provincial authorities, local consultants working for the provinces and others charged with producing Adaptation Plans.

As part of LEDS process, if requested and funded by MONRE, AIT could include materials on mitigation to broaden scope of Provincial Action Plans. AIT-VN has recently been working with breweries to assess

use of energy and to identify opportunities for reducing energy use and more efficient, streamlined operations, and these efforts have been well received by breweries. AIT could work in partnership with USFS forest products utilization specialists, US private sector forest industry specialists, and others to examine and support increased energy efficiency and reduced emissions of forest products / furniture industry in Vietnam. Regarding opportunities to reduce emissions from rice cultivation, collaboration could be promoted with Norway's BIOFORSK initiative, as they have been working with International Pacific Research Center – Hawaii to reduce emissions from rice cultivation through better crop production systems management "climarice" see http://www.bioforsk.no/ikbViewer/page/prosjekt/tema?p_dimension_id=16927&p_menu_id=16934&p_sub_id=16928&p_dim2=20300

http://www.bioforsk.no/ikbViewer/page/prosjekt/tema?p_dimension_id=16927&p_menu_id=16934&p_sub_id=16928&p_dim2=20003

Fulbright School – Vietnam

The Fulbright Economics Teaching Program has been established in Ho Chi Minh City with the support of the US Department of State, as a partnership of the University of Economics in HCM City and the Harvard University, Kennedy School of Government. With expertise from Vietnamese economists and faculty associated with the Kennedy School - Ash Center for Democratic Governance and Innovation, the Fulbright School of Vietnam offers university courses, training workshops and seminars and supports policy dialogue to develop the capacity of Vietnamese government officials and others to address complex policy issues and to promote innovations in government and public policy leadership. Officials in leadership positions with MONRE, MARD, Provincial Committees and Districts have benefitted from the offerings of the school, including the Minister of Agriculture and Rural Development who is a graduate of the Kennedy School. See http://www.fetp.edu.vn/home.cfm

To date, the School has investigated land use issues among others, and recognizes the need and opportunity to support informed public policy discourse with broad participation of key stakeholders on the questions of institutional incentives, governance and economic drivers in relation to sustainable land use and conservation of natural resources, particularly in the context of climate change impacts. While Vietnam has an abundance of national target plans, strategies and action plans, and ample funding from development assistance partners, program implementation could be strengthened and both institutional and economic incentives reinforced to achieve improved results in terms of environmental conservation and ensuring effective responses to climate change.

Forest Science Institute of Vietnam

This research institute has been organized under MARD in 1998 to serve as the leading research organization for forestry, and brings together scientists engaged in forest industry, forest economics and other forestry research topics. With 650 staff working in 6 research divisions and in 9 regional research centers, the FSIV has already initiated a number of research projects to investigate and assess the impacts of climate change on forest plantation pests and diseases. With the establishment of some 3 million hectares of forest plantations of pine, acacia, eucalyptus as well as native species, the researchers of FSIV have been monitoring and tracking the incidence of leaf spot, beetle outbreaks,

cankers, root rot, rust and other fungi and insect attacks affecting hundreds of hectares. The Institute is investigating treatment options while researching the role of climate change in contributing to the outbreak and spread of these pests and diseases. The Institute has also contributed to REDD baseline studies and PFES research projects, and is looking at the impact of sea level rise on mangrove forests.

See http://www.fsiv.org.vn/?lang=english-iso-8859-1

Forest Sector Support Partnership (FSSP)

FSSP was established in 2001 as an independent unit of MARD to coordinate and support the collaboration of stakeholders working in the forestry sector of Vietnam. The FSSP has a specific mandate to orient support for the Vietnam Forestry Development Strategy (2006-2020), and its effectiveness in this regard is enhanced by the participation of 24 international partners, including major aid agencies, international research organizations, NGOs and others. The partners collaborate through participation in a Steering Committee, Coordination Office, Technical Executive Committees, Working Groups and 6 forestry Regional Networks to support activities and dialogue with stakeholders in forested provinces. FSSP has helped to establish the Trust Fund for Forests with funding from SDC, SIDA and others to support community forestry, and tandem with the UN REDD program and REDD Network has reinforced coordination on forest inventory, forest cover analysis, development of capacity for REDD + measurement, reporting and validation (MRV) interventions as well as with the Forest Law Enforcement, Governance and Trade (FLEGT) program and compliance with the provisions of the Lacey Act.[2] With the further development of activities to control illegal logging, the FSSP membership is likely to be expanded to include representatives of the private sector, forest products association and local NGOs. The FSSP does not have a large secretariat in terms of staffing, yet it is apparently playing an important and effective role in promoting information sharing, coordination and the increased efficiency and effectiveness of interventions in the forestry sector, including capacity building and training activities. See: http://www.vietnamforestry.org.vn

Awareness and Public Perceptions of Climate Change Issues

While there is a growing awareness of the need to address climate change, as well as considerable enthusiasm and substantial commitments of resources to respond to the issues and challenges of climate change in Vietnam, the effective implementation of interventions is constrained by a number of factors, including a shortage of national staff assigned to coordinate, manage and support key programs related to climate change, and the need to upgrade technical skills, climate change knowledge and capacities required to successfully carry out the long list of priority interventions. A number of projects and NGOs have organized many training workshops in recent years to help raise awareness of climate change issues, threats and scenarios, and to help develop skills for vulnerability assessments, programming of climate change adaptation and mitigation activities and "mainstreaming" responds to climate change in development strategies and activities. However, capacity at the provincial and local level is still relatively weak, and national programs such as REDD+ are not yet fully staffed. And while there are a number of working groups and networks focused on climate change, there continue to be

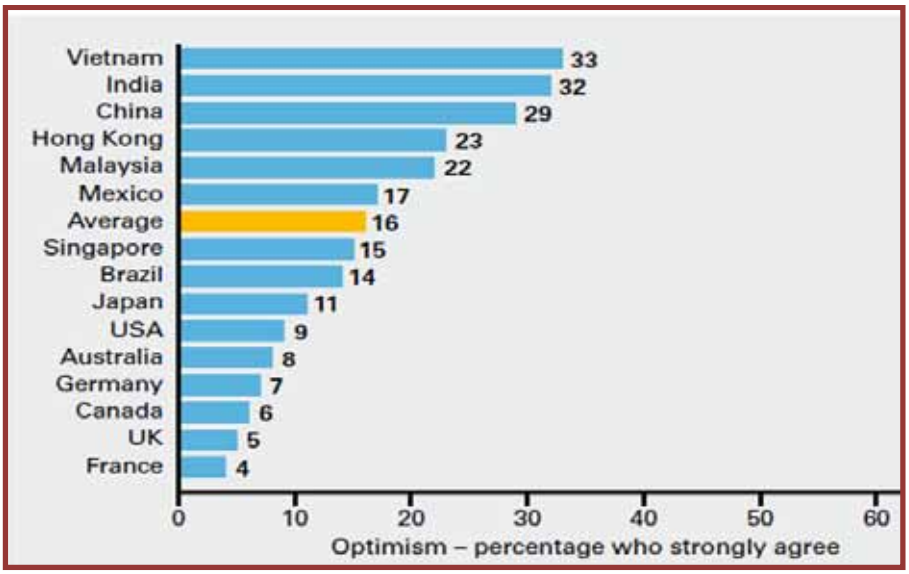
[2] The Lacey Act is a 1900 United States law that bans trafficking in illegal wildlife. In 2008, the Act was amended to include plants and plant products such as timber and paper. This landmark legislation is the world's first ban on trade in illegally sourced wood products. For more information, see http://www.wri.org/fla/laws_lacey.php

constraints and weaknesses in circulating and disseminating information and in leveraging appropriate collaboration among those with expertise, particularly between the government technical departments and universities.

Despite these constraints, it is interesting to note the results of a recent survey that indicates that the people of Vietnam, and of other emerging economies especially in Asia, are in general quite aware of climate change, and concerned about the potential negative impacts of climate change even as they are optimistic that climate change can be addressed and willing to play their part in adopting needed actions. In September 2010, the fourth annual Climate Confidence Monitor was organized with the support of HSBC, working in partnership with the Climate Group, Earthwatch, WWF, and the Smithsonian Tropical Research Institute. In 2010, this survey was carried out in 15 countries whose populations make up over 50% of the global total. The survey showed that awareness of climate change is now almost universal, with only 3% of respondents saying they have not heard of climate change.

30% of the people of Vietnam ranked climate change as their number one concern – well above pandemic diseases, terrorism, poverty, economic stability and other issues. This ranking of climate change as the top concern was the highest percentage among all of the 15 countries surveyed. On average, 38% of the people surveyed strongly agree that climate change is among the biggest issues they worry about – with a high of 57% in China, 50% in Brazil and 43% in Vietnam vs. 23% in Japan, 18% in the US and 16% in the UK. In a number of industrialized countries, respondents were relatively pessimistic about the scale of the challenge and the commitment of governments and others to tackle climate change, however, Vietnam , China and India all ranked much higher in terms of confidence that needed actions will be undertaken, commitment to making a personal effort and optimism about being able to stop climate change. 33% of those surveyed in Vietnam were optimistic that climate change could be stopped – which was again the highest percentage among the countries surveyed. (Fig. 1)

Figure 1: Survey Results – HSBC 2010 Climate Confidence Monitor



In reviewing the results of this fourth survey of climate change perceptions and attitudes, it reveals that the highest level of concern about climate change is in the emerging markets and developing economies where the direct impact of climate change is likely to be greatest, particularly with respect to the vulnerability of the concerned populations. In discussions with local communities and district officials, this relatively high level of awareness of climate change as an issue and as a threat was also emphasized – owing in part to the wide exposure of people to radio, television and other mass media. Furthermore, for rural populations whose livelihoods are directly dependent on natural resources and directly affected by changes in weather and climate, even casual conversation reveals their familiarity with climate change issues – because they are already living with the impacts of changes in rainfall, temperature, storm severity and frequency, drought, flooding, salt water intrusion and other climate change related impacts.

The often recommended interventions in "awareness raising" and information – education – communication would do well to acknowledge this high level of awareness and to capitalize on local knowledge in a dialogue aimed at identifying practical, relevant and effective approaches to respond to climate change. Furthermore, efforts to mobilize needed investments to address climate change would also do well to recognize that the potential interest of the private sector and "green entrepreneurs" who are confident, committed and optimistic about joining forces to tackle climate change.

CHAPTER 3 – CONTEXT FOR USAID CLIMATE CHANGE ASSISTANCE

In reviewing the context for programming USAID assistance in addressing climate change issues in Vietnam, a number of elements were taken into consideration, including the need to comply with the funding criteria and objectives outlined by USAID/Washington, and the need to fit within the recently developed USAID Mission Strategy for Vietnam. In addition, this context includes a review of relevant initiatives supported by a range of US Government agencies in Vietnam and in the Southeast Asia region. The assessment team also wanted to take full account of the various national target plans, strategies, action plans and program priorities that are related to climate change adaptation and mitigation, as well as the donor initiatives and development assistance already being provided or planned to support the implementation of these strategies and programs, including support being planned for the development and implementation of a Low Emissions Development Strategy (LEDS) for Vietnam (see following section).

Compliance with USAID/Washington funding criteria and objectives

The USAID/Vietnam Mission anticipates programming additional development assistance funding in two broad areas related to climate change: Adaptation and Sustainable Landscapes.[3]

Adaptation funding from USAID is intended to help communities adapt to the ongoing or anticipated negative impacts of climate change by building adaptive capacity and reducing vulnerability to climate change risks and events, such as changes in the frequency of severe storms, rainfall, floods, droughts, stream flow, hot and cold weather and associated effects on food production, water supply, pests and diseases, and health and well-being. Illustrative examples of activities eligible for adaptation funding would include the development of tools for improved risk analysis, modeling, early warning systems and decision making for reducing vulnerability to the impacts of climate change. Capacity building and strengthening of community level planning, communication and response systems aimed at reducing vulnerabilities would also be eligible, along with a range of interventions designed to increase water storage, improve flood management, adapt to sea level rise, reduce the impact of droughts and related climate change events on crop production and improve community based management of natural hazards related to climate change.

Sustainable landscape (SL) funding from USAID is aimed at reducing Green House Gas (GHG) emissions from the land use sector, and to enhance carbon sequestration in association with improved land use and the conservation and management of forest resources. Sustainable landscape interventions should

[3] USAID funding for climate change includes assistance to support 1.) Adaptation, 2.) Sustainable Landscapes and 3.) Clean Energy; funding for the USAID/Vietnam bilateral assistance program is currently earmarked for Adaptation and Sustainable Landscapes (categories 1 and 2); the LEDS strategy and planning process target interventions for Sustainable Landscape based mitigation and Clean Energy (categories 2 and 3).

include a specific climate change and forest landscape based mitigation objective and associated policy reforms, and include provisions for monitoring of emissions reductions or enhanced sequestration. SL interventions would include assistance aimed at building institutional capacity and improving governance to reduce illegal logging and to respect the rights of indigenous and forest-dependent people. Illustrative examples of activities eligible for sustainable landscapes funding would include support for the development and broad participation in national or sub-national REDD+ strategies and programs, assistance with GHG inventories and the monitoring and reporting of forest-related emissions reductions and sequestration, strengthening of forest governance, land and forest tenure, economic incentives and other elements of the enabling environment designed to address the root causes and drivers of deforestation and forest degradation, and support for increasing forest carbon market readiness, pilot forest carbon finance schemes and the development of legal frameworks and equitable carbon revenue and benefit distribution systems.

Fit with the USAID/Vietnam Strategy and Development Context

USAID has recently developed its Mission Strategy to provide a framework for programming USAID development assistance that takes full account of the development context and challenges of Vietnam, including national development priorities and the interventions of other donors. The USAID strategy notes the impressive progress of Vietnam as it advances to the status of a middle income country while pursuing its export-led growth strategy. At the same time, these economic developments bring with them an urgent need to address the growing challenges of climate change in tandem with more sustainable use of natural resources and more effective environmental protection efforts (see Box on key characteristics of Vietnam's economy and environment).

The fast pace of Vietnam's economic growth, urbanization and land use changes together with the country's population distribution and anticipated catastrophic impacts of sea level rise, increased frequency of typhoons, severe storms, flooding, drought, perturbations of crop production, disrupted water supplies and diminished hydropower generation and other climate change impacts make Vietnam especially vulnerable to climate change. Water availability is already a critical concern in many areas of the country, and water supplies are not sufficient to meet basic human needs in four river basins (Red, Dong Nai, Ma and Sre Pok), and this situation is likely to be exacerbated by climate change. Groundwater is the primary water supply for 55% of the population, but groundwater levels are falling due to overexploitation for irrigated crops, industry and other uses. Overfishing and destructive fishing practices (use of dynamite, poison, trawling) has already reduced fish catches to 30-40% of pre-1990 levels, and hydropower developments along with pollution, habitat transformation and changes in water flows related to climate change are likely to further reduce fish catches and negatively affect tens of millions of Vietnamese. Biodiversity is threatened by illegal logging, wildlife poaching, sedimentation, pollution and habitat loss and the direct and indirect impacts of climate change are likely to add to the threats to biodiversity.

Given this context and these challenges, the USAID strategy aims to help the Government of Vietnam (GVN) to balance economic growth with natural resource conservation and environmental protection. It specifically seeks to support the development of a shared vision for balanced and sustainable development, improved analytical capabilities to chart a path to realize such a vision, a strengthened

policy and legal framework to support enlightened development, and targeted assistance for effective local implementation. The USAID strategy proposes to use positive incentives, including market-based approaches to achieve behavioral change. Priority interventions included in the USAID strategy include a range of activities aimed at addressing climate change, water resources management, environmental protection and biodiversity conservation. Support is proposed for integrated packages that provide a comprehensive solution to the challenges of climate change adaptation, along with measures designed to improve water supplies, conserve natural resources and protect the environment.

Key characteristics of Vietnam's economy and environment (source: USAID Strategy)

- 13th largest country with a population of 86 million (2008), growing by 1 million annually, and with a 4% annual rate of growth in urban areas; ¾ of the population are in rural areas and heavily dependent on agriculture and fisheries
- Total land area of 31 million hectares, with 31% of area in agriculture and 42% forest land
- 75% of the population lives in the coastal and lowland areas covering just 25% of the country
- Agriculture employs 60% of the labor force; 25 million people rely on forests and 8 million rely on fisheries for income; natural resources are an important contributor to GDP, livelihoods and food security
- Vietnam is a globally significant exporter of rice, shrimp, cashews, tea and coffee; in recent decades, rubber and forest products industries (with exports currently valued at $3 billion annually) have also greatly expanded
- Vietnam has rich coastal and marine ecosystems with mangrove forests, swamps, lagoons, estuaries, coral reefs, sea grass beds contributing to fisheries and tourism
- With a coastline of 3260 kilometers, no point is further than 285 kilometers from the sea; 80% of industrial development is in the coastal corridor between Haiphong and Ho Chi Minh City
- Land use has shifted dramatically in recent decades as natural forests and wetlands have been altered or converted with the expansion of industries, agriculture, aquaculture and urbanization
- While the economy and population are heavily dependent on natural resources, these rural and natural resource based production systems and coastal developments are vulnerable to climate change impacts
- Water is a serious economic and environmental concern; 2/3 surface water originates outside of Vietnam's borders, and only 24% of the rural population has access to clean water; 75% of the available surface water is concentrated in 3 major river basins: Mekong, Red and Dong Nai
- Environmental pollution is also a growing concern; Vietnam has a high rate of use of chemical pesticides and inorganic fertilizers; only 5% of industrial discharges to air, water and land are controlled; 160,000 tons of industrial waste is discharged annually; only 6% of urban sewage is treated, resulting in annual economic losses of $800 million

Climate change interventions should fall within the framework of the GVN National Target Plan to Respond to Climate Change, with particular attention given to the management of flood hazards and to reduce vulnerabilities to reduced water supplies in low flow periods and droughts. The strategy notes the importance of reducing the rate of growth of Vietnam's carbon emissions through the promotion of energy efficiency, renewables and clean energy. USAID also aims to strengthen the ability of the GVN to adapt to climate change through improved information and early warning systems and analytical

capacity, and through strengthened legal and regulatory frameworks. The strategy also recognizes the need to strengthen disaster management capabilities and assistance to support displaced populations as sea level rises while promoting improved land use and sustainable use of natural resources. (See Annex C - Illustrative activities identified in USAID environment strategy.)

The strategy's geographic focus is on the Mekong Delta, the Red River Delta, the Dong Nai river basin and Southeast Economic Zone and the greater Da Nang area. In recognition of the significant level of financial commitments from other donors to support climate change adaptation and mitigation activities, USAID also recognizes the need to work closely with the GVN and other donors to identify the optimal and most effective use of USAID assistance. During the climate change assessment process, the team took account of the wide range of relevant, proposed interventions in the USAID strategy, and worked to gather information on other activities already underway in these areas while considering the relative urgency and potential benefits of specific, potential interventions.

Related US Government initiatives

LEDS development and capacity building

Vietnam has been invited to be one of the first five countries to participate in the "Enhancing Capacity for Low Emission Development Strategies" (LEDS) initiative. The Low Emission Development Strategy (LEDS) initiative is aimed at assisting developing countries who are seeking to improve their citizens' standard of living by finding ways to grow their economies while decreasing net greenhouse gas emissions over the long-term. Vietnam, like many of the initial countries selected for LEDS funding, will receive technical assistance valued at approximately $2 to 3 million to contribute to the preparation of a reduced emissions strategy focused on development and capacity building in the energy, renewable energy, forestry, and agriculture sectors.

Once Vietnam was selected as a LEDS country, USAID contracted a team from IRG to conduct a pre-scoping mission. This group interviewed NGO and donor stakeholders from the energy, renewable energy, forestry, and agriculture sectors in Vietnam and compiled a desk study. On November 1-5, 2010, an interagency team with representatives from USAID, DoS, EPA, NRIL, USFS, and DoE traveled to Vietnam for a scoping mission. They met with officials from relevant agencies in the GoV (MONRE, MARD, MOIT, MOST, MOF, MPI), NGOs (CARE, GRET, CCWG, WWF, Winrock,), and donors (JICA, WB, GEF, UNDP, DFID, ADB, GTZ) in order to learn more about their climate change priorities and their current activities particularly in the area of mitigation.

The LEDS team looked at key sectors of the Vietnamese economy to identify opportunities for and challenges to reducing greenhouse gas emissions. The team also analyzed Vietnam's needs with respect to climate economics, including collecting and analyzing data to project the economic effects of mitigation actions; and implementation of the National Target Program to Respond to Climate Change (NTP), including prioritizing mitigation actions. The team concluded that Vietnam needs to build capacity in key climate change mitigation skills, including climate science, greenhouse gas measurement and accounting, engineering, and economic and policy analysis. They further concluded that an opportunity

exists to achieve multiple objectives under the initiative through support for institutional capacity-building in government, universities, and NGOs.

Vietnam is highly focused on climate change, and the scoping group found that there is a wealth of on-going projects in the country. Vietnam is more focused on adaptation than mitigation, but many of the stakeholders were open to the mitigation emphasis of LEDS particularly when there is possible overlap with adaptation efforts.

The LEDS team identified two approaches to engaging with Vietnam during the design phase of the initiative. The first approach would focus on cooperating with MPI to study low-emission, climate-resilient development to inform MPI's economic planning. The second approach would focus on cooperating with MONRE to implement the NTP. DFID and the World Bank are taking the former approach through a joint project with MPI, and DANIDA is taking the latter approach through a $40 million program with MONRE to support the NTP. Following their visit, the LEDS team decided to participate in the DFID-World Bank-MPI study.

The LEDS scoping team also concluded that Vietnam needs to build capacity in key climate change mitigation skills and that an opportunity exists to achieve multiple objectives under the initiative through support for institutional capacity-building in government, universities, and NGOs. One approach would be to focus on university-level capacity-building, which would advance key bilateral and regional goals and follow through on the US Secretary of State's commitment to strengthen bilateral educational cooperation to help Vietnam develop Can Tho University.

The format for a LEDS is flexible. For example, it may be a guiding document, a law, a set of regulations, etc. Still, in whatever form, this country-led mitigation strategy will be developed in the next two years. During that time, the USG will assist in the creation in a LEDS for Vietnam by providing technical support through the participating USG agencies working in collaboration with concerned ministries, institutions, networks and universities in Vietnam. The USG will continue working with the Vietnamese to determine what specific types of technical expertise would be most relevant for US agencies to provide in future trainings, exchanges and workshops. As the LEDS for Vietnam is prepared, USAID and other USG funding for climate change mitigation should be consistent with the national LEDS for Vietnam that emerges from the planning and capacity building process.

USAID – Regional Development Mission for Asia

Since 2006, USAID/RDMA supported Winrock International's Asia Regional Biodiversity Conservation Program (ARBCP) to assist the Government of Vietnam in implementing a successful pilot for Payment for Forest Environmental Services (PFES). This program has benefited biodiversity conservation and improved the livelihoods of more than 32,000 rural poor in Lam Dong Province and across Vietnam. This project also helped to inform the design and subsequent signing of a national PFES Decree. On September 24, 2010, the Prime Minister of Vietnam announced that a National PFES Decree had been approved. The PFES Decree transforms the way forests are viewed and managed in Vietnam, providing a measure of assurance that critical forests, and the ecosystems services they provide, will be protected

into the future through the scale up of PFES nationwide. This successful program will be concluding in February 2011.

It is estimated that deforestation and land use changes result in 20% or more of total annual global carbon emissions. This is a major contributor to climate change. RDMA's Responsible Asia Forestry and Trade (RAFT) program is working to mitigate this emission by promoting timber trade from legal sources. RAFT also conducts trainings and workshops on sustainability and the protection of high conservation value forests. Additionally, RAFT fosters efforts under the international framework, Reducing Emissions from Deforestation and Forest Degradation (REDD), by working with private timber enterprises to monitor their carbon emissions.

United States Geological Survey and the Dragon Institute

The USGS National Wetlands Research Center created the Delta Research And Global Observation Network (DRAGON) to improve management outcomes for large deltaic coastal systems like the Mississippi River Delta by comparing the ecological, hydrological, geological, and biogeochemical processes of these systems around the world. DRAGON brings together scientists and managers to model the large river deltas across the globe thereby developing a science framework for comparing, integrating, and ultimately predicting the effects of key drivers and management practices in these ecosystems. Under the auspices of Prime Minister Dung and President Bush the DRAGON project in Vietnam established an institute at Can Tho University.

Forecast Mekong is part of the DRAGON Partnership. It is an interactive data integration, modeling, and visualization system to help policy makers, resource managers, and the public understand and predict outcomes from climate change and development projects in the Mekong River Basin. Ultimately, the Forecast Mekong program will be a planning tool that can be used to visualize the consequences of climate change and river management.

To date, as part of their work with Forecast Mekong, USGS has promoted technical exchange by supporting the 2009 Forecast Mekong workshop where more than 75 climate change scientists and managers from the Mekong region and the US identified gaps and prioritized future efforts. They generated sea-level rise scenarios using historic records and projections for the future. By creating a video on the unintended consequences of water management scenarios, the USGS demonstrated a method for integrating and visualizing data. Additionally, using satellite data, they constructed baselines for conditions in the Mekong to monitor flooding and plant growth. The impact of the drought in spring 2010 was shown when new satellite data presented a departure from the baseline conditions.

Currently available funding for USGS support to the Forecast Mekong Program is focused on seven project areas: 1) Supporting Can Tho University and the International Crane Foundation's Persistent Organic Pollutants Project (POP) by developing wetland maps and helping set POP sampling protocols ; 2) Providing inventory, development, dissemination, and training for geospatial information and scientific visualization through the creation of a database and Forecast Mekong website; 3) developing a Graphic Visualization Tool (GVT) for simulating the impacts of hydropower dams starting with data from the USDA Soil and Water Assessment Tool (SWAT) developed for the Mekong Basin and continuing with

two SWAT workshops; 4) Pulling together a preliminary assessment report that examines the potential effects of dams on the Mekong including lessons learned from dams on the Mississippi River; 5) Capacity building in Can Tho University by basing a geospatial specialist there for two six-week periods to help them build a database; 6) Providing a groundwater scientist to the Mekong River Commission for a 90-day detail in Phnom Penh; and 7) Maintaining communications about Forecast Mekong with stakeholders in the region and in the US.

United States – Vietnam Climate Change Working Group

In 2008, the US-Vietnam Climate Change Working Group (CCWG) was formed as a new subcommittee under the US- Vietnam Scientific and Technological Cooperation Agreement. The purpose of the CCWG is to promote long-term cooperation on climate change adaptation and mitigation efforts by providing an institutional framework and a network of experts and organizations. The Vietnamese co-chair is from MONRE and the US co-chair is from USGS. Each side can appoint ten working group members from governmental, academic, or non-governmental organizations.

During the inaugural meeting in March 2010, the CCWG decided to focus on four priority areas or projects: establishing benchmark Surface Elevation Table (SET) devices on the Vietnam coast to measure coastal elevation change; building scientific climate change assessment capacity in Vietnam; holding trainings to increase Vietnam's capacity to respond to climate change related events such as floods, landslides, and typhoons; and sharing information and creating programs to enhance climate change education and community engagement. Progress is being made in each of these areas.

There are several proposed activities for future collaboration. Among them is the establishment of a lower Mekong monitoring program to assess hydropower impacts on sediment and elevation. The idea is to increase the number of Surface Elevation Table (SET) measurements taken along the Mekong River in order to better understand the impacts of dams on the river's wetland habitats. Dams reduce sediment load by trapping water and sediment in the upstream reservoirs. Sediments are necessary for counteracting the effects of subsidence and rising sea levels, both of which are caused by climate change.

Another proposed activity is climate change impact assessments for critical conservation areas such as habitats that are critical for endangered and threatened species and National Parks. Work will be done to develop assessment programs and models to forecast the impacts of climate change.

Additionally, USAID/RDMA plans to implement a Mekong River Basin Climate Change Adaptation Project (MRB-CCAP) to promote ecosystem services and food security in Mekong River Basin. The objectives of the program are to: strengthen human and institutional capacity to develop and implement climate change adaptation plans and strategies; strengthen policies, tools, methodologies and practices for ecosystem services valuation and climate resiliency; demonstrate and scale-up model actions for integrated approaches to climate change adaptation; and strengthen and sustain regional learning networks to share and replicate best practices. USAID/RDMA envisions a five-year program with an estimated budget of $9 million to $9.9 million. Program activities are expected to be a comprehensive study of the likely impact of climate change on prevalent agriculture subsectors and ecosystems in the

Basin. Lessons from the project will be widely disseminated through a regional knowledge center platform. (see http://www.pwrc.usgs.gov/CCWG/index.html)

National Oceanic and Atmospheric Administration

NOAA's current engagements in Vietnam can be grouped into four areas. The first is the Quang Ninh-Haiphong integrated coastal management capacity building which includes linkages and support to a Vietnamese-funded marine spatial planning demonstration project for 2011-2012. Quang Ninh and Haiphong area was chosen because it demonstrates user conflicts, global marine heritage relevance, and the potential for integration with marine conservation and capacity building efforts in China. In May 2010, NOAA held a conference in Haiphong on climate assessment, national sea level monitoring capacity, and regional ecosystem-based management. The primary audience was Quang Ninh and Haiphong officials largely from their Departments of Planning and Investment, Vietnam Administration of Seas and Islands (VASI), and IUCN-Vietnam. These efforts in Quang Ninh and Haiphong capacity building recently led to VASI securing funding from MOST to launch a marine spatial planning demonstration project funded at 2.7 billion Vietnamese Dong over the next two years. NOAA is Planning a conducting a training there in spring 2011 which will involve the provincial and municipal government agencies of Quang Ninh and Haiphong, hosting a delegation to the US in 2011 to explore the US experience in coastal and marine spatial planning (CMSP), and authoring a joint paper on CMSP this year. NOAA's 2012 plans will build upon this year's engagements.

Their second area of activities has been centered on national marine protected area (MPA) management capacity building with MARD and Danida. For the past five years NOAA has been working on building capacity with MPAs throughout Vietnam to more effectively manage their sites. As part of that program NOAA has conducted two trainings on "Planning for Climate Change Adaptation for Coastal and Marine Resource Managers." The agency taught the first course in partnership with the Institute of Hydrology and Meteorology from Hanoi in Hue two years ago. This course focused on Tam Giang Lagoon as a study site. The second training was a year ago in Can Tho. This training focused on the Mekong and importantly, it brought in people from Can Tho University.

The third category of efforts falls under the NOAA's MOU on coastal and marine science and technology with VASI. The MOU serves as a framework for cooperation and information sharing on such things as policy and law, environmental monitoring and forecasting. In summer 2011, they are planning to host the MOU's Joint Working Group meeting in the US to outline next steps for the overall cooperation.

A fourth area for cooperation is being explored on what NOAA might be able to do in the Lower Mekong in terms of watershed management, pollution mitigation/reduction through best practices. This work would potentially be done in conjunction with Cambodia.

NOAA has supported the Law on Marine Island Resources that VASI is drafting. According to Deputy Administrator of VASI Nguyen Chu Hoi , there is now a third draft and VASI will proceed with the legal submission process in 2011. He said that climate change has been incorporated into the new draft. In December 2009 and March 2010, NOAA sent two teams to help VASI with the drafting by sharing US

experiences and highlighting some international conventions that Vietnam should consider being consistent with.

US Forest Service

USFS began working with Vietnam in 2005. The agency offers practical knowledge and expertise as a land management agency with a pool of experts engaged in various aspects of climate change initiatives and research, forestry, natural resources management and biodiversity conservation both in the US and in an array of countries around the world. In 2008, USFS and the MARD signed a Letter of Intent for enhanced technical cooperation. The agreement covers areas of mutual interest such as: 1) adaptation to, and mitigation of, the impacts of climate change on forest management and protection; 2) restoration and conservation of forest resources; 3) financing mechanisms for biodiversity conservation and environmental services; 4) fire management, prevention and control; 5) watershed and coastal protection and ecosystem services of forests, including ecotourism.

Many of USFS technical cooperation activities with Vietnam are directly related to both adaptation and mitigation aspects of global climate change. USFS has started to explore with MARD how to assist with climate change issues, particularly related to coastal and mangrove ecosystems. This would build on USFS regional efforts with the Center for International Forestry Research (CIFOR) to document carbon pools of mangrove and peat forest ecosystems across the Asia and Pacific region. Data suggest that mangrove forests hold more carbon per area than most terrestrial ecosystems, increasing their value for mitigation as well as adaptation efforts. The intention is to include Vietnam in this program, which will involve training in field methodologies, assisting with monitoring, and modeling ecological change in these economically valuable and extremely vulnerable ecosystems.

USFS has worked with the Asia Regional Biodiversity Conservation Program (ARBCP) led by Winrock International and funded by the USAID/RDMA. The objectives of ARBCP are to restore and maintain ecosystem connectivity in biodiversity corridors and across landscapes, to promote sustainable financing for biodiversity and natural resource conservation, to improve the livelihoods of the rural poor, and to strengthen environmental governance and institution building. All of these goals will increase resiliency to climate change. One way USFS is assisting ARBCP is by peer-peer sharing of technical experiences and capacity building using an emerging tool for preserving forested landscapes and protecting water quality, called payment for ecosystem services (PES). Addressing PES is one mechanism for incorporating climate change considerations into forest management planning. The Forest Service organized a US-based study tour/training course on PES for counterparts from the Mekong Sub Region, including four high-level Vietnamese decision makers. Several teams of USFS experts in ecotourism, hydrology, and other fields have visited Vietnam and provided input to the ongoing ARBCP activities in Lam Dong province.

Fire management strategies designed to reduce risk of wildfire have in some cases adversely affected biodiversity and watershed quality in Vietnam. An example of this is in Tram Chim National Park in Vietnam, where managers traditionally were artificially flooding the area to prevent forest fires, all the while endangering the food source of the Sarus Crane (*Grus antigone*, the tallest bird in the world).

Through a series of expert visits and training in controlled burning, USFS worked with Vietnam's Forest Protection Department to develop an ecological management program for the Tram Chim National Park. Due to the global interest in the status of the Sarus Crane and associated national level visibility of fire issues at Tram Chim, the site served as an ideal platform and compelling the nation to address fire policy issues in Vietnam's protected areas. Improved fire management is an example of both adaptation and mitigation. Climate change will lead to an increase in forest fires, so countries need to adapt and manage for this trend. Forest fires also release huge amounts of carbon, so their prevention is an important forma of climate change mitigation. Principle support for this program was from the USAID/RDMA and IUCN. Key partners and support for these efforts have been from UNDP, IUCN, and the Mekong River Commission, in collaboration with the Mekong Wetlands Biodiversity Program (MWBP).

In the future, the USFS plans to assist Vietnam in developing climate change adaptation responses, together with other US agencies, universities and NGOs, focused on coastal regions. Utilizing the agency's work in Micronesia and elsewhere, USFS will help local authorities build practical scenarios delineating likely coastal erosion, inundation, and storm surge zones. Training would focus on assisting plans to increase ecological resilience and reduce economic, health and livelihood impacts by preserving natural coastal forests such as mangroves and restoring forests that serve vital ecological functions. USFS also hopes to strengthen the forest governance in Vietnam with a focus on transitioning from forest management planning that favors timber production as the primary economic use of forests to an ecosystems services orientation, through peer to peer exchanges with MARD. To this end, and in support of REDD readiness, the agency also plans to assist with trainings in forest inventory and monitoring. The USFS has also joined the U.S. Vietnam Climate Change Working Group.

US Environmental Protection Agency

The EPA has two climate change-related programs in Vietnam: Regional Capacity Building for Sustainable National Greenhouse Gas Inventory Management Systems in Southeast Asia and the Global Methane Initiative. The sustainable GHG inventory management project seeks to improve the institutional capacity of a country to support a sustainable inventory system and provides technical assistance on methods for data collection. The Global Methane Initiative is an international public-private partnership designed to decrease GHG emissions by increasing the capture and use of methane.

Phase I of the Regional Capacity Building for Sustainable National Greenhouse Gas Inventory Management Systems in Southeast Asia is a three-year UNFCCC project that is being done with technical assistance from EPA. This program, which began in 2007, targets seven Asian countries including Vietnam. It works with GHG inventory teams in the region to apply tools that support the development of a sustainable national inventory management system for future inventory preparation. The project also helps national experts identify opportunities for improved data collection. This higher-caliber data then allows for the application of more rigorous methods of analysis in key sectors such as agriculture and forestry. An important output of the project will be the development of comprehensive multi-tier GHG software for collecting GHG inventories in the agriculture and land use, land use change, and forestry sectors. This will help countries prepare inventories for these complex sectors. So far, the

project has conducted an initial scoping meeting and three learn-by-doing training events focused on software, templates, and tools. Finally, the inventory software and tools can provide historical data which is a key input for estimating national reference cases for evaluating REDD projects. EPA is now preparing for Phase II of the program.

As the name implies, EPA's Global Methane Initiative focuses on mitigating methane, the second most common GHG and a critical gas whose anthropogenic emissions are forecasted to rise by 23% in the next decade. This partnership of 38 countries works to improve the recovery and use of methane while increasing economic growth, promoting energy security, and improving local air quality. In Vietnam, for example, methane from animal waste has been converted to cooking fuel. EPA's approach involves 1) technical assistance and project identification through data collection, assessment reports, and pre-feasibility studies; 2) tool development and technology transfer; and 3) training and capacity building in the form of training workshops and study tours. Currently, there are five methane recovery projects under construction in Vietnam, with 12 more in planning stages. These projects are designed to treat swine waste and recover methane (as biogas) for use in an energy application. Vietnam has also expressed interest in recovering and reusing methane from landfills and coal mines.

CHAPTER 4 – NEEDS AND OPPORTUNITIES FOR ADAPTATION FUNDING

To date, much of the climate change related assistance to Vietnam has focused on planning to respond to climate change, with a focus on assistance for adaptation. Specific analyses have looked into scenarios for sea level rise and forecasting of anticipated climate change effects. Relatively less effort has been devoted to site specific assessments of the vulnerability of Vietnam's poor households, and to the evaluation and documentation of the negative impacts and climate change adaptation that is already ongoing. Programming of future assistance by USAID should help to address this gap and challenge.

Reduction of Vulnerability to Extreme Weather and Disrupted Water Supplies

As reported by OXFAM, poor men and women are particularly at risk to climate change in Vietnam, as they are already experiencing the consequences of the changing climate, yet they are most often ill-equipped to reduce of adapt to these consequences. In many villages, women and households directly dependent on natural resource based production systems and livelihoods are hardest hit by the extreme weather events and natural disasters. They often cannot swim, have fewer assets or alternative livelihoods and less access to alternative employment opportunities when their crops or livelihoods are negatively impacted by typhoons, floods, droughts and other impacts associated with climate change (Oxfam, 2008). In mountainous areas, the incidence of poverty is especially high among ethnic minorities who are well positioned to benefit economically and to receive assistance to enhance their role in conserving forests and protecting upland watersheds in ways that could reduce their vulnerability and help them to adapt to climate change.

Although Vietnam ranks as one of the world's highest annual rainfall countries, high flows in the wet season mask the dramatic influence that the dry season has on water availability. Rain mostly occurs during 4-5 months in the rainy season, and accounts for 75-85 percent of the year's total precipitation volume (MONRE 2006). In addition, two-thirds of Vietnam's surface water flow originates outside its borders. Six major river basins depend on water inflows from other countries; over 95 percent of the Mekong River flow is generated outside Vietnam and nearly 40 percent of the Red River water originates in China. As a result, water availability is considered inadequate to meet human needs in the Red-Thai Binh, Ma, Sre Pok, and Dong Nai basins. Due to the level water extraction, 11 of 16 major river basins are considered stressed (Kellogg Brown and Root 2009).

As noted in preceding chapters, a further limitation to the availability of surface water is pollution. A small proportion of industrial, agricultural and residential effluent is treated before being discharged to surface waters. In some areas, pollution is creating conditions of water scarcity despite a physical abundance of water. Industrial and municipal wastewater and household wastes are primary contributors to pollution. With 180 industrial processing parks and economic centers, 12, 259 health care centers, and 72,012 businesses, millions of cubic meters of untreated waste water enter rivers each day. In rural areas, increasing amounts of pollutants are contributed from livestock production,

pesticides and chemical fertilizers, craft villages, and effluent from aquaculture (MONRE 2006). Surface water in all major river basins does not meet the requirements for drinking water in terms of organic pollution, and there are few monitoring data to determine levels of other contaminants (Kellogg Brown and Root 2009).

The effects of climate change in Vietnam will likely exacerbate the existing water supply and water quality issues. Increased demand and reductions in available water during the dry season could increase the concentration of pollutants, increased intensity and duration of floods could entrain more pollutants from flooded agricultural and industrial areas, and salt water intrusion will be a primary concern for fresh water supplies in low lying areas like the Mekong and Red River deltas.

Sea level rise and Flooding

Sea level rise and salt water intrusion are long term threats that will require massive investments. In the short term, reinforcing the protection, restoration and regeneration of coastal mangrove forests can help to reduce the vulnerability of local communities and to both adapt to and mitigate climate change over the longer term. It is also important to work in these lowland, coastal environments to develop or strengthen early warning systems, to reinforce dykes and other infrastructure to protect against storm surges, to improve water storage and utilization and to assist in the dissemination of drought resistant crops.

To address the root causes of uncontrolled flooding and diminished low season water flows, and associated disruptions to cropping systems and hydropower production, it will be necessary to work at the landscape level in upstream areas. These landscape interventions will need to target assistance to the rural poor, and work with them to enhance food security and to protect and improve water supplies. Consideration can be given to options for providing “risk insurance” and to promote the dissemination and use of drought resistant crops, or alternative, perennial crops like bamboo and associated livelihoods that are less susceptible to disruptions from climate change related weather events. Many of the “adaptation” interventions will necessarily and logically integrate “sustainable landscape” type interventions associated with controlling the drivers of deforestation and forest degradation through more sustainable land use planning and improved natural resources management (see Chapter 6).

Biogas Technologies

Although a review of the needs and opportunities for the development of alternative, renewable and clean energy technologies was beyond the scope of this assessment, such energy related interventions are critically important for the mitigation of climate change. And in the context of integrating activities at the landscape level, it is both feasible and opportune to capitalize on opportunities to mitigate emissions through more efficient use of energy and the promotion of renewable sources of energy, including solar, mini-hydro, biofuels and biogas. Biogas deserves particular attention, given the past levels of assistance in Vietnam to develop appropriate biogas technologies, and the recent development of plans to scale up the use of biogas.[4]

[4] See the programs of SNV, GRET, CCRD and other NGOS active in promoting biogas.

In both lowland and upland areas, communities can benefit from the widespread adoption of biogas plants to collect, digest and use livestock and human wastes in a manner than contributes to improved hygiene and human health, more sustainable energy use, increased household incomes and other economic and environmental benefits. Household biogas plants can contribute to a reduction of 1.5 tons of CO2 per year through the combined effect of reduced fuelwood consumption and lowered methane gas emissions – while helping to offset costs for purchased fuels and to contribute to increased local incomes and well-being ,and reduced vulnerability. SNV, CCRD, GRET and others have provided leadership and assistance for the emergence of a national program to support the dissemination of biogas technologies, and these proven technologies and approaches for dissemination and adoption can be readily incorporated into landscape level interventions.

Needed areas of Adaptation and Water Resources Assistance

Assessment team meetings brought out a number of strong, common themes where adaptation assistance in association with water resource related support is needed. These themes could be generally grouped into three categories: Information, education and communication (IEC) at the local level, including disaster preparedness; technical capacity building and exchange, including continued research and assessment of water resource conditions and trends; and support for local implementation of water-related pilot projects and strategies associated with the National Water Resource Strategy and National Target Plans for Climate Change and Rural Water Supply and Sanitation, etc. General findings from the discussions are as follows:

1) Information, education, and communication

   Expand geographic coverage and frequency of IEC for issues such as climate change awareness, sea level rise, disaster preparedness, adaptation strategies, forest practices and water quality, safe drinking water, and waste water treatment and water quality.

   Utilize IEC to strengthen social institutions and local governance capacity in ways that contribute to managing and reducing risks associated with climate change, and help to increase the resiliency of the poor and enable them to adapt to the challenges and opportunities associated with climate change.

2) Technical capacity building and data collection and interpretation

   Community based planning is the starting point for scaling up provincial and national responses – and efforts should focus on building local capacity to assess vulnerabilities, take stock of livelihood resiliency strategies, and to draw on local experiences and expertise in adapting to climate change, with a focus on reducing risks from likely extreme climate change events and natural disasters

   Expand GVN's technical capacity with short and long term training opportunities and exchanges with United States scientists and universities.

Develop an updated Red River basin-wide plan for stream flow regulation from reservoirs that would balance water supply, water needs, water quality, power generation, and ecosystem needs. The current flow regulation model was not developed with climate change in mind.

Support research of methodologies to trap sediment and re-establish mangrove forests in areas of high wave energy along the coast.

3) Local implementation of pilot projects and strategies

Expand the successful biogas model to reduce wood burning. Benefits to water resources would include maintaining forest cover and associated water quality and quantity, and preventing groundwater and surface water pollution from animal and human wastes.

Support participatory watershed management. Benefits to water resources would include maintaining forest cover and soil quality to ensure delivery of clean water to local rivers and streams. Sustainable forest management with appropriate management practices related to road construction and maintenance, ground disturbance, soil compaction etc., would lead to less erosion and sedimentation, which equates to more reservoir storage capacity and longer reservoir life.

Improve the sea/river dyke and drainage system to accommodate floods, sea level rise, and storm surges as well as salt water intrusion. This could include mangrove reforestation along the coastal sea dykes as well as placement of tide gates on rivers and drainage channels to limit salt water intrusion during the dry season.

Implement large-scale waste water treatment systems for industrial, medical, and domestic effluent, including trade villages. Also, support the expansion of pilot projects for small-scale waste water treatment. Treating waste water will become more important to ensure a safe water supply as low flow (dry season) conditions are exacerbated by climate change.

Climate change effects in Vietnam will vary with latitude and elevation, with the most immediate impacts in the heavily populated, low elevation river deltas. Consequently, given the amount of agriculture-based economic activity and the number of residents, the Mekong Delta is receiving a high degree of attention and funding from the GVN, donor countries, and various NGOs. Taking into account the extreme vulnerability of the Mekong delta and the opportunity for leveraging and coordinating support through the Lower Mekong Initiative (LMI), it would be logical for USAID to align increased support for climate change in the Mekong delta and within the framework of the LMI. The team also notes that during meetings with agencies and interest groups in Hanoi, there was considerable interest in ensuring that appropriate levels of international assistance are also applied to the north, particularly in the Red River basin. The Red River has similar issues as the Mekong, but with a larger network of Vietnamese hydropower projects and only China as an upstream neighbor. Depending on the level of resources available, USAID might consider providing assistance in the Mekong as needed, and also encourage and support similar planning and adaptation measures in the Red River.

Potential Synergies with USAID and Other USG Programs

As noted in Chapter 3, USAID and other USG agencies already have a number of projects related to climate change adaptation and mitigation in Vietnam. Being aware of these activities will help USAID/Vietnam maximize their contribution to climate change efforts by 1) allowing the mission to support or build upon successful programs that address areas or mutual concern, 2) pinpointing gaps where USAID/Vietnam can complement ongoing activities, and 3) giving the mission an ability to create a long-term, overarching strategy based on the current projects and respective USG agency strengths that will guide future UGS climate change programs in Vietnam. Particular mention can be made of the following potential synergies with USAID and USG programs.

USAID Environmental Management Strategy.

The USAID/Vietnam strategy for Improved Environmental Management has the stated goal of helping the GVN achieve economic growth that is balanced with environmental protection and natural resource conservation. Necessarily, there is a strong focus on water resources, particularly in the context of climate change. Intermediate results proposed in the strategy include a strengthened response to climate change, improved water resource management, enhanced marine and terrestrial biodiversity, and effective control of environmental pollution. Since the USAID strategy was designed to support GVN's implementation of various NTPs and strategies, the priorities of USAID and GVN are aligned. So in terms of strengthened responses to climate change (IR 1) the improved policy framework, assessments, disaster planning assistance, and continued technical support for the Mekong climate change agreement are all relevant. With respect to water resource development and protection, the sub-intermediate results of improved water quality (Sub-IR 2.1), reduced impacts from climate change on water resources and supply (Sub-IR 2.2), improvement of legal and regulatory framework for environmental management (Sub-IR 4.1), and reduced level of environmental contamination (Sub-IR 4.2) could be considered joint priorities. Most, if not all, of the water-related adaptation measures that could be funded under the USAID Adaptation funding pillar would serve to support this environmental management strategy.

US Vietnam Climate Change Working Group

The CCWG has brought together many USG agencies that in turn bring many areas of technical knowledge for exchange with counterpart GOV agencies. The CCWG also welcomes NGOs and universities to their meetings, trainings, and workshops. Supporting CCWG would be an excellent way to promote a wide variety of technical exchange.

United States Geological Survey (USGS)

The USGS is actively involved in climate change activities in the Mekong Basin through projects such as DRAGON and Forecast Mekong. Current and proposed activities are largely targeted at monitoring, data integration, and modeling. As such the USGS, through its existing network in Vietnam, could be a primary component any program of technical capacity building and exchange with Vietnamese scientists.

One of USGS' focal areas for 2011 is capacity building in Can Tho University. One thing that GOV officials, NGO's, and donors alike expressed was a pressing need for capacity building. USAID might consider supporting a focused area to grow technical capacity related to climate change in Vietnam.

National Oceanic and Atmospheric Administration (NOAA)

NOAA has also recently been involved in Vietnam and has developed relationships and MOUs with two bureaus under MONRE, the Vietnam Administration of Seas and Islands, and the Hydrometerological Administration (Hydromet). As with USGS, NOAA could be a primary player in technical capacity building and exchange for coastal and marine science issues in Vietnam. NOAA has a number of constructive activities in Vietnam. On the policy level, USAID could support their efforts to support VASI draft a Law on Marine Island Resources.

US Forest Service

USFS has a history of technical exchange on a wide variety of climate change-related activities. Of particular importance is their planned assistance in Inventory and monitoring training for REDD and mitigation purposes. By supporting this, USAID would help the REDD program protect forests and would increase climate change mitigation potential in the country.

USEPA and others

EPA's program for creating sustainable national GHG inventories will help countries like Vietnam assess their current emissions from the landscapes sector and begin to target specific areas where reductions can be made. Both of these actions are critical for climate change mitigation and the LEDS process. By supporting such a project, USAID/Vietnam would also be furthering LEDS in the country.

CHAPTER 5 – NEEDS AND OPPORTUNITIES FOR SUSTAINABLE LANDSCAPES FUNDING

This section includes a brief review of forest area trends based on an analysis of forest inventory data, as well as information on linkages between forest, agricultural and other land use. The team met with a number of stakeholders to discuss the drivers of deforestation and forest degradation, along with the many strategies, programs and initiatives designed to control deforestation, promote reforestation and to improve watershed management and provide for sustainable land use. This includes the national REDD Plus Program and related support and other forestry sector interventions.

Forest resource and land use trends in Vietnam

Vietnam's landscapes were naturally dominated by forest vegetation, particularly the mountainous Northern provinces, Central Highlands and areas of coastal mangrove, as indicated by the earliest land cover maps (figure 2).

Figure 2. Forest cover in Vietnam in 1943; map produced by the Center for Forest Information and Consultancy, Forest Inventory and Planning Institute, Ministry of Agriculture and Rural Development, Socialist Republic of Vietnam.

Rapid and dramatic social and economic changes, including extended periods of warfare, contributed to significant deforestation nationwide. More recent forest cover maps show the extensive forest loss that occurred and is particularly striking in Northern Vietnam. These maps also show the more recent recovery of forest cover that has taken place due to government policies, programs and an overall increase in social stability and economic prosperity.

Some 49% of the land area of Vietnam or nearly 16 million hectares are designated as forest land. Over 8 million hectares are allocated to production forests, about 6 million hectares for protection forests and 2 million ha for special use forests. Special use forests includes 36 national parks, over 100 nature reserves and a total of 168 protected areas. In principle, this allocation reflects a balance between production and protection. In recent years, there has been increasing emphasis on reinforcing protection and on reforestation, as only 39% of the forest land supports a forest cover.

In recent years, the government has taken steps to allocate more forest land to household and communities, and more than 20% of forests are now managed by rural households and local communities. Another 20-25% of forests have been allocated to People's Committees at the provincial and district levels, and large areas are still controlled by state forest enterprises. Support for improved forest management has not kept pace with rising demand for forest products, and as a result, Vietnam's booming forest products industry has had to rely on imported wood. Vietnam now imports about $1 billion worth of timber every year, to produce furniture and other processed wood exports valued at nearly $3 million; despite recent increases in the area of plantations, domestically produced wood only covers about 30% of the demand for the furniture industry.

From 1992-1997, the 327 program promoting the regreening of Vietnam and this effort was followed by the 661 program from 1998 to 2010, with the aim of reforesting 5 million ha. Although these newly reforested areas have not been systematically mapped and inventoried, it appears that the 661 program did help to increase forest cover on some 3-4 million ha. The combined result of 327 and 661 programs reportedly increased forest cover from 27% to 39% over the past 15 years, and a follow up program is being designed to increase forest cover to 43% of the country. This is an impressive achievement, especially considering that the incidence of poverty was reduced from 58% to 19% of the population during recent decades, largely through the promotion of a range of export crops such as shrimp aquaculture, coffee, tea, cashew and rubber that directly competed with forest land use.

The figures reported in the 2010 Food and Agriculture Organization of the United Nations Global Forest Resource Assessments (FRA) report (2010) confirm the steady increases in forest area for Vietnam

(figure 3). These figures were produced by the Forest Institute for Planning and Investigation (FIPI) as part of their National Forest Inventory and Assessment Program (NFIAP).[5]

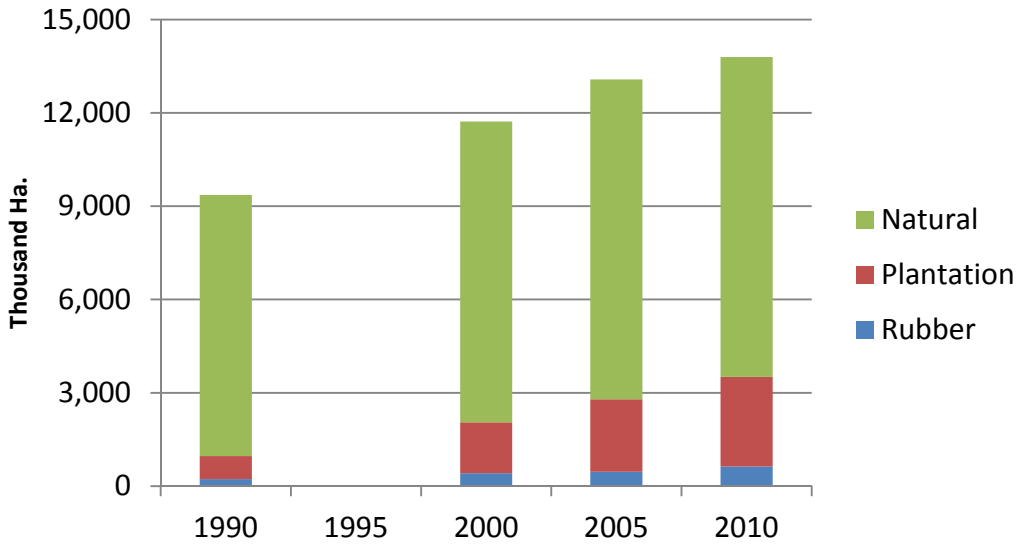


Figure 3. Forest area trends (in thousands of hectares of forest) in Vietnam, as reported in the United Nations Food and Agriculture Organization Global Forest Resource Assessments (FRA) of 1990, 2000, 2005 and 2010, by natural forest, plantation forest and rubber plantation (Dinh Huu et al. 2010).

Increasing forest area has been primarily due to plantation establishment, and to a minor extent, the inclusion of rubber (*Hevea brasiliensis*) plantations as forest. Prior to 2000 rubber plantations were not considered forest by FRA and their inclusion as forest has been somewhat controversial. Natural forest has increased, also, but that trend will be examined in more detail later in this report. [6]

[5] Note that figure 2 shows numbers calibrated and harmonized across past reports by FRA and have been used here to simplify comparison. The FRA report years of 1990, 2000, 2005 and 2010 roughly correspond to the NFIAP cycles; 1991-1995 (cycle I), 1996-2000 (cycle 2), 2000-2005 (cycle 3), and 2005-2010 (cycle 4). The gap that appears in this figure in 1995 is not due to a lack of inventory information (cycle 2); rather FRA did not produce a report that year. Details on the NFIAP's implementation history and methods can be found in Kujur (2007) and a draft overview of plans for cycle 5 can be found in MARD (2010).

[6] The NFIAP data is available in summarized form upon request to FIPI or MARD. Hardcopy reports have been produced with sets of tables and forest cover maps at national, regional, provincial, district, and in some cases commune, scales. Some of the past NFIAP reports have only been published in Vietnamese and are not all available in digital formats. The easiest manner to access reformatted summary forest resource information for Vietnam is through the FRA reports (Dinh Huu et al. 2010). An effort is underway, funded by the Finnish

The trends in Vietnam's forest area appear promising and there is reason to be optimistic about the future of Vietnam's forests, particularly if efforts currently underway to increase the economic returns from forest land use are successful so that forest conservation and management can compete with alternative forms of land use. However, a closer examination of these figures reveals some important points regarding the NFIAP data itself and trends in certain forest types that are relevant to projects related to the UN Reduced Emissions from Deforestation and Degradation (REDD) program and the USAID mission in Vietnam.

"Rich" forest area trends and forest degradation

The UN REDD program is meant to reduce emissions from both deforestation and forest degradation. There has been recognition of significant forest degradation problems, but the main thrust of Vietnam's forestry activities seems to have been directed toward mitigating deforestation by increasing forest cover through artificial plantation under the Five Million Hectare Reforestation Plan (5MHRP or Programme 661). The success of this program in increasing forest cover is obvious and reflected in both the NFIAP numbers and visits to the countryside where entire hillsides are covered with relatively young plantations. However, forest degradation, while recognized as a serious problem in Vietnam, has not received the same program resources.

Although MARD states that "the period of forest degradation has been overcome substantially" (Ministry of Agriculture and Rural Development 2006) on account of the success in artificial plantation establishment, there is growing recognition that this statement might be true for deforestation but not degradation. MARD further states in the same document that "the forest area is increasing but its quality and biodiversity of the rich, medium natural forest and bio-diversity has been continuously reduced, due to changes of forest use purposes, over-exploitation, illegal logging and slash-and-burn agriculture. Increased problems with floods and drought have occurred in many places, due to the protection functions of forests being degraded and substantially reduced" (Ministry of Agriculture and Rural Development 2006).

Evidence for this trend can be seen in the NFIAP data. "Rich forests" are defined by the NFIAP as "forest of native species, where there are no clearly visible indications of human activities, the ecological processes are not significantly disturbed and they contain high standing volume" and have the highest growing stock volumes. Put in different terms, "rich" forests are those natural forests with the largest trees, highest levels of biodiversity and least amount of human disturbance. Troublingly this category of natural forest has decreased substantially and steadily over the 4 inventory cycles (figure 4). MARD draft documents and other sources cite a period of illegal logging and severe forest resource depletion

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government, to re-format and organize the past NFIAP data and produce a more accessible database structure to house it and the new data. This project is described in more detail later in this report.

in the late 1990s that might have contributed to the decline in "rich" forests (Ministry of Agriculture and Rural Development 2010; UN-REDD Programme 2010). [7]

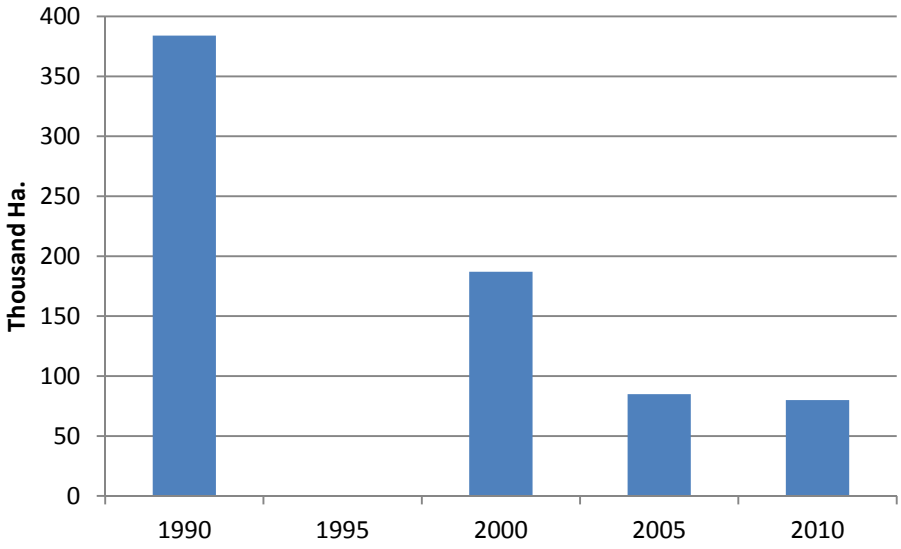

Figure 4. Forest area trends (in thousands of hectares of forest) in Vietnam, as reported in the United Nations Food and Agriculture Organization Global Forest Resource Assessments (FRA) of 1990, 2000, 2005 and 2010, for "rich" natural forests (Dinh Huu et al. 2010).

It is possible to lose carbon stored in forest vegetation even while forest area is increasing if there is loss of large trees and/or the replacement of heavily-stocked natural forest with plantations of young, small artificially regenerated trees, the degradation aspect that the REDD program is meant to curtail. Forest degradation and the attendant loss of biodiversity and ecosystem services have been noted throughout the region as well as in Vietnam (Gilmour et al. 2000; UN-REDD Programme 2010).

These trends are further examined in the pilot study province Land Use/Land Cover Change (LULCC) matrix results presented in a draft report from the Japan International Cooperation Agency (JICA, 2010). There workers observed the loss of high and medium quality natural forest but with offsetting concurrent artificial plantation such that there was a net gain in forest area. Additionally, the JICA (2010) report raises questions about the FRA methodology used to estimate growing stock volume in Vietnam. Growing stock volume is shown to be increasing along with forest area. But, the FRA (2010)

[7] In recognition of this situation, MARD states in the National Forest Strategy that "About 70% of current production forests are poor quality natural forests and newly - restored forests, which could not be harvested in upcoming 5 - 10 years. They should be zoned [and managed?] for regeneration, improvement and enrichment so as to improve their quality to create large timber sources and other forest products after 2010" (Ministry of Agriculture and Rural Development 2006).

figures assumed that volume per hectare has been constant since 2000 and simply multiplies that value by the number of hectares. Forest degradation in the past 10 years that might have lowered the average volume per hectare would not have been taken into account, which is what the report authors suspect has occurred. JICA study results due in 2011 will address these very important questions. The UN-REDD program, however, is less optimistic about quantifying emissions due to forest degradation and state that "Reduction of emissions due to forest degradation will likely be foregone. The lack of reliable data on past levels of forest degradation prevents the establishment of a REL for forest degradation" (UN-REDD Programme 2010).

Mangrove forests area trends

The NFIAP results also show that mangrove forest area has also decreased since 1990 (figure 5).

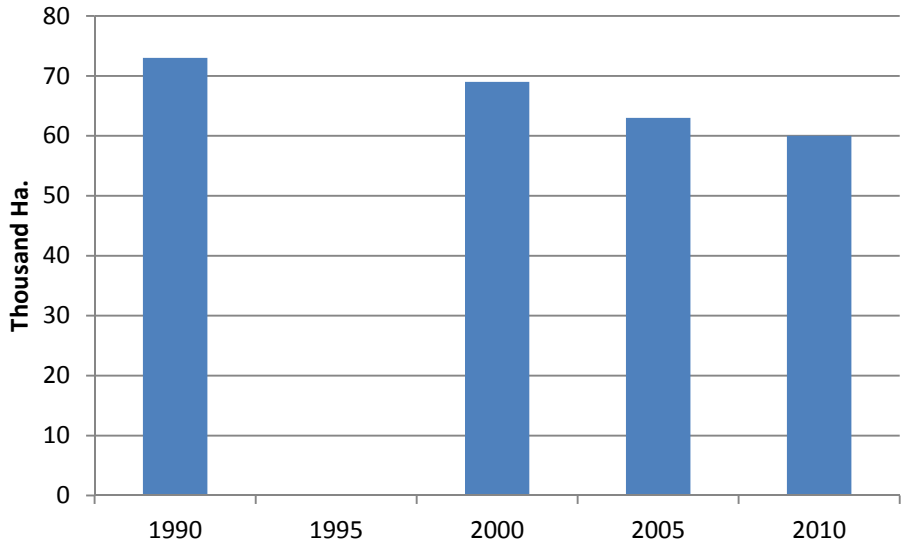

Figure 5. Forest area trends (in thousands of hectares of forest) in Vietnam, as reported in the United Nations Food and Agriculture Organization Global Forest Resource Assessments (FRA) of 1990, 2000, 2005 and 2010, for mangrove forests (Dinh Huu et al. 2010).

The general level of recognition of the importance of mangrove forests to coastal and estuarine ecosystems in Vietnam is impressive, particularly as expressed by the local farmers and fishermen. The educational activities, such as those undertaken by CARE in Thanh Hoa province as part of mangrove conservation and plantation efforts, have been vital to the success of mangrove plantation and management projects. The experiences from Typhoon Damrey, where tidal surge damage was worse where mangroves were absent, also provided the local people with an illustration of the protective value of mangrove forest. Additionally, the local people have found another source of income from the shellfish that can be collected within the newly established mangrove stands. It also appears that these groups have the necessary technical capacity for successful mangrove propagation and plantation establishment.

It should be noted that there is a nationally approved "Master Program for Mangroves" (senior author Mr. Ho Manh of FIPI). Mangroves are seen by Vietnam's government as very important to environmental protection and climate change mitigation and the government of Vietnam applied to World Bank for funding support.

Bamboo "forests"

Vietnam recognizes in its NFIAP a category of forest referred to as "bamboo forest". The FRA (2010) Vietnam country report shows 1,425,000 ha of bamboo forest; over 10% of the country's reported total 13,797,000 forested hectares. This forest type predominates on the mid-elevations of the hillsides across the landscape in Northeastern Vietnam.[8] Regardless of bamboo forest classification, this vegetation type is widespread and provides an important income source to local people. In the areas visited by the assessment team, bamboo forest support industries where the primarily luong bamboo (*Dendrocalamus membranaceus*) was roughly processed and those products shipped to larger facilities for final elaboration. But these bamboo forests suffer from degradation similar to that in other forest types due to poor management and poor harvesting practices. Degraded stands of bamboo forest were undergoing trial enrichment planting and implementation of a system of coppice/clump management that appeared very effective and promising. The projects of Groupe de Recherche et d'Échanges Technologiques (GRET) are very good examples of bamboo management and product diversification that would be highly beneficial to the local populations that derive incomes from products generated by this forest type.

REDD+ and Vietnam's forest management strategies

Vietnam has emerged as a global leader and pioneer in implementing REDD+. With substantial support from Norway, the UN, the World Bank and others, Vietnam has made significant progress in preparing itself to move ahead with the operationalization of REDD+. MARD's National Forest Strategy (2006) and Action Plan (2008) do not actually mention REDD as they were drafted prior to the mobilization of significant funding for Vietnam's REDD+ program. In the past year, however, the REDD Network and working groups have engaged the participation and collaboration of all major partners working in the forestry sector in Vietnam. REDD+ program goals now provide another incentive for Vietnam to promote sustainable forest management across all forestry sectors (UN-REDD Programme 2010). The

[8] The stands were typically dominated by bamboo with some trees interspersed. Tree cover was often quite low, particularly where there was cassava cultivation in the margins between bamboo clumps. Melia (*Melia azerdach*) trees were a favored native tree and commonly left to grow larger while other trees seem to have been selectively harvested. However, it should be noted that bamboo is not recognized as a tree by the FRA program and much, if not most, of the bamboo forest we saw did not meet the minimum requirement for forest of 10% canopy coverage in tree species. Additionally, cassava cultivation in the forest understory excluded natural forest regeneration. Strict interpretation of the FRA forest requirements would exclude all these hectares from being considered forest. Additionally, it is unclear whether harvested bamboo is tracked as timber harvest, rather it appears that bamboo is considered a non-timber forest product in harvest volume reporting; an interesting inconsistency in how bamboo forests are treated in FRA reporting.

need for accurate and timely forest information is especially important to meet the information needs of the UN REDD+ program.

NFIAP data, trend analysis and Reference Emission Levels

Vietnam's forest area trend-line (figure 3) is not as smooth as would appear due to significant methodological changes that have taken place from NFIAP cycles 1 to 4. Both FRA and NFIAP forest definitions and categories have changed more than once since 1990 and it has been necessary for those at the FIPI to digitize and reclassify their past forest cover maps and re-estimate forest area with each new definitional change (see figures 1 and 2 for examples). Some of this involved digitizing hardcopy maps on digitizing tables, then reclassifying the polygons. Also, the imagery used to make those land cover maps and forest area estimates has evolved considerably over time. More recent images have higher resolutions that now show non-forest inclusions in areas that were once considered contiguous forest, introducing doubt as to whether the previous condition was non-forest also or that the land cover has changed in the interim. These changes have introduced some degree of uncertainty regarding the estimates, but probably not enough to seriously affect the overall trend direction.

A more definitive trend reassessment is being undertaken by the JICA. As part of the overall REDD+ aid strategy, JICA has the responsibility of establishing the Reference Emission Level (REL), an important marker for assessing future emissions. The REL that JICA establishes will represent the historical emissions from deforestation and forest degradation in forested land at a national level. This historical baseline will be projected into the future and used to assess emissions reductions from those projected levels. However, the proposed REL produced by JICA from reclassified MODIS scenes from 1990-2010 have not met with approval from the Vietnamese government due to JICA's use of lower resolution MODIS imagery (250m resolution). Vietnam's preference is that JICA use higher resolution SPOT5 (2.5m resolution) imagery, in part to allow for detailed mapping for forest types and separation of non-forest inclusions within forested areas that cannot be distinguished in the lower resolution imagery (Ministry of Agriculture and Rural Development 2010). The REL methods are being reconsidered now.

Whatever methods used, the JICA REL project will also produce valuable LULCC matrices and maps. LULCC matrices and maps show which land uses and covers change to which other uses and covers. For example, a LULCC matrix will allow one to know that forest area has increased in a certain province, on exactly what land cover it has replaced. This information will be useful for targeting resource management efforts and policies.

NFIAP and data management improvements

The efforts by JICA will address inconsistencies that have arisen over time with NFIAP's forest area estimation and mapping from remotely-sensed imagery. Organizing and standardizing the NFIAP field plot data across the cycles is another challenge that is the responsibility of projects sponsored by the Finnish government. The Forest Management Information System (FORMIS) project works to produce a platform to be used by other projects and agencies that want to manage forest information in a coherent manner. The NFIAP data is in a fragmented state with different forest classifications, different data storage formats and varying numbers of field plots across the 4 cycles. All of these problems greatly limit the data's utility for REDD+ assessments and other sustainable forest management efforts.

FIPI has been funded by Finland to work on an MS Access database that will contain all the NFIAP data in a consistent, standardized format. Then FORMIS will work with the data further to convert it into a web-based format, although there is some doubt at this time whether the NFIAP database would just contain summary data or raw (unprocessed) data. The latter would be more useful for the FORMIS project's goals but there has been resistance from the Vietnam's government to share the NFIAP raw data.

The FORMIS project will not only provide access to the NFIAP data, but also the forest inventory data being produced by projects like those of Germany's *Gesellschaft für Technische Zusammenarbeit* (GTZ) and JICA. Forest-level inventory data being collected to support sustainable forest management plans could also be used to improve province and national-level forest inventory estimates if the data being collected is standardized and stored in a compatible formats. FORMIS intends to work with the FIPI and these other agencies to agree on field data collection and data formatting standards, and then create a platform that could access these separate databases and hold their descriptive metadata. FORMIS would then develop applications that would provide processing and estimation options, as well as access to the data via a web-based portal, creating a distribution channel for information from many projects and many agencies. The NFIAP could improve their national, regional and provincial forest estimates through access to these other, smaller-scale forest inventories once all the data is made compatible.

Currently the Finnish government is also assisting FIPI with the renovation of the NFIAP in preparation for cycle 5. There is recognition within Vietnam's natural resource agencies (as reflected in draft documents from MARD) that the past NFIAP methods needed to be improved to meet the information needs of not only REDD+ activities but sustainable forest management nationwide (MARD 2010). Simultaneously the FAO's National Forest Monitoring and Assessment support program is updating their recommended forest inventory methods and those changes will also be taken into account for the NFIAP. The objectives of the NFIAP renovation can be found in the draft report by (Ministry of Agriculture and Rural Development 2010).

It should be mentioned that the U.S. Forest Inventory and Analysis (FIA) program has potentially useful experiences to share from the efforts to make nationally consistent what had previously been multiple, separate regional forest inventories. Also, FIA's Database (FIADB) and National Information Management System (NIMS) are working examples of a nationally consistent forest inventory database and processing system that has been adapted to incorporate smaller-scale forest inventories on national and experimental forests sampled at varying intensities, thus sharing some of the goals of the FORMIS project. Finally, the automated processing of time series satellite image and production of LULCC matrices is a very active area of FIA research and those experiences might be useful for Vietnam. Examples of LULCC matrices and maps can be found in the JICA draft report (2010).

Relevance of forest inventory trends and REDD+ to sustainable landscape interventions

The NFIAP results from the past 20 years, while suffering from some shortcomings, provide valuable information for identifying problem areas in the forestry sector. Other donor agencies in the forestry sector have used the NFIPA information to identify target provinces for sustainable forestry

management projects. USAID-funded projects could be directed toward those identified problem areas and provinces as well. The renovation of the NFIAP and related REDD+ activities themselves, however, are very well supported technically and financially by other donors thus providing few areas where USAID assistance would be useful.

In summary:

- The land area with forest cover is expanding, but there are still challenges and gaps in the forestry sector where USAID funded projects could be beneficial:
    - Forest degradation is still a major issue and projects that address it through sustainable forest management programs would be highly beneficial. USAID and others should examine closely the evaluation of the 661 program and apply the lessons learned in the next phase of support for reforestation
    - Support for Community Forestry should be expanded, building on the initial phase of support funded through FSSP/TFF, and national efforts to allocate forest lands and management rights to communities should be accelerated and streamlined in the interested of decentralizing improved forest management and promoting local initiatives at forest restoration and regeneration
    - Mangrove forest loss is ongoing, so any projects that involve or support mangrove reforestation and sustainable management would also benefit Vietnam.
    - The drivers of deforestation and forest degradation are primarily economic and linked to policy and institutional weaknesses; a well-informed policy dialogue with the members of the REDD and FSSP networks and supporting research and analysis is needed to more fully understand and address these drivers, and could be supported in collaboration with the Fulbright Center, RECOFTC, Forest Trends, CIFOR and others

- REDD+ target provinces are still being chosen, but other donor agencies such as JICA and GTZ have already chosen and are active in some provinces. The PFES experience piloted by USAID funded ARBCP and GTZ provides useful experience for the development and implementation of benefit sharing arrangements for REDD+. USAID-funded projects could focus on:
    - Provinces being targeted for the scaling up of the PFES pilot activity, to add value to sustainable forest land use and to help address the drivers of conversion of forests to agricultural production and other land use with higher opportunity costs
    - Provinces with a high need and potential for restoration of coastal mangroves, and / or opportunities for scaling up community based protection and improved management of remaining natural mangroves with associated benefits for climate change mitigation, adaptation, biodiversity conservation and food security
    - Complement other projects within a province to create a broader, sustainable landscape level project in associated with integrated, community based NRM and participatory watershed management

- There are opportunities for the sharing of technical experiences between the USDA Forest Service, Vietnam's natural resource management ministries and donor agencies working on different aspects of renovating the NFIAP. Specifically, USDA Forest Service International Programs, the National Inventory and Monitoring Applications Center (NIMAC) within FIA and the recently launched SilvaCarbon initiative that also includes: the U.S. Agency for International Development (USAID), the U.S. Geological Survey of the Department of Interior (USGS), the U.S. Environmental Protection Agency (EPA), the U.S. Department of State, the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration within the Department of Commerce (NOAA), and the Smithsonian Institution.

Opportunities for Synergy with USAID and Other Programs

USAID Assistance for Vietnam's Low Emissions Development Strategy

Since future USG funding for climate change mitigation should fit within the LEDS that is created during the next two years, USAID should consider the LEDS when allocating their funding.

By design, the LEDS strategy should delineate areas where the technical expertise of USG agencies would help Vietnam improve its low-emission development. USAID could support US agencies as they conduct trainings, exchanges, and workshops that provide relevant technical transfer.

Regional Development Mission for Asia

USAID/Vietnam might consider supporting GOV/MARD in rolling out the new PFES Decree across the country. It is likely that GOV will expand the PFES concept that was piloted in Lam Dong to other provinces. Lam Dong province may be able to serve as a national training center where other provinces can learn about PFES.

Also, building upon the watershed-focused PFES project in Lam Dong province, USAID/Vietnam might thing about adding a REDD component to this pilot. Very few projects have been looking at how watershed PES payments (and other types of financing) might be bundled with REDD forest carbon payments.

Following the award by RDMA of a new regional sustainable landscapes cooperative agreement, USAID/Vietnam may consider opportunities for coordinating associated bilaterally funded climate change activities in targeted landscapes.

CHAPTER 6 – SUMMARY OF FINDINGS AND RECOMMENDATIONS

Recommended Approaches and Interventions

Poverty is at the root of heightened vulnerability to the risks and hazards associated climate change. While dikes and other infrastructure investments can help Vietnam to respond to the anticipated impacts of sea level rise and other long term consequences of climate change, continued progress with poverty reduction, especially among the rural poor and most vulnerable groups is critically important and should be fully integrated into responds to climate change and associated development programs.

People depend on natural resources and the goods and services that they provide for their livelihoods and well-being. As the impacts of climate change grow in magnitude and manifest themselves in sometimes unforeseen ways, the protection and management of ecosystem services – the provisioning, regulating and supporting services of the natural assets of Vietnam's coastal, agricultural and forested landscapes – will play an increasingly important role in helping communities to cope with climate change. Water resources are strongly affected by climate change, and it will be especially important to make provisions for the improved management of watersheds and better storage and distribution of water resources, along with improved access to protected supplies of drinking water and more efficient use, recycling and conservation of water resources.

Food security can be strongly and positively impacted by more effective efforts to manage soil fertility, and to control erosion and increase the moisture holding capacity of soils, particularly in times of drought and irregular rainfall. Expanded use of inorganic fertilizers and selected, drought resistant crops can provide some measure of relief and benefit in responding the climate change, but will be less effective if fundamental measures are not undertaken to restore and protect the sustainability of agro ecosystems through community based land use planning, integrated watershed management with the adoption of best practices in soil and water conservation and sustainable forest management.

Forests can be either a source or a sink of carbon and other greenhouse gases, depending on the success of efforts to reduce deforestation and forest degradation, and to scale up the protection, restoration and sustainable management of forest resources. The improved conservation and management of forests can have a major impact in responding to climate change, in terms of enhanced rural livelihoods, more secure supplies of fuel wood and other forest products, increased resiliency and diversification of rural production systems, more effective protection of critical watersheds, a reduction in soil erosion and increased reliability of stream flow and aquifer recharge.

While Vietnam is already experiencing significant negative impacts from climate change on crop production, water supplies and local livelihoods, and although this country of 86 million people is among the most vulnerable countries to sea level rise and the extreme and abnormal weather events associated with climate change, the government leadership and international development partners of

Vietnam are committed to addressing climate change. The National Target Plan to Respond to Climate Change, together with a host of other related target plans, action plans, strategies and programs provide a broad framework for interventions related to climate change adaptation, mitigation and associated sustainable economic development, poverty reduction and environmental conservation.

Dozens of development assistance partners and NGOs are involved in investments totaling hundreds of millions of dollars to support the implementation of climate change related programs and interventions. The scope of interventions and diversity of institutional arrangements present considerable challenges for coordination and operational capacity as well as sustainable financing. While there are numerous actors and a complex array of projects and funding mechanisms, there are unmet needs, gaps and challenges that remain to be fully addressed, including further training and capacity building, and better application of available knowledge. In working to address these needs, USAID will want to participate actively in the networks and working groups that have been constituted to help address climate change issues, and to coordinate closely with the key ministries, departments, aid agencies and programs already working on specific challenges, such as the operationalization of REDD+, the implementation of a water resources development plan, research and infrastructure investments to address sea level rise and salt water intrusion, flood warning, disaster preparedness and management and the like.

The USAID Environmental Strategy, together with national plans and strategies, provide a clear orientation for interventions that are needed to address the major issues and challenges. There is a clear and unmet need for increased direct interventions and investments at the community level in rural areas to reduce vulnerability and facilitate adaptation to climate change. To date, a number of US government agencies and regional funded USAID projects and NGO partners have been engaged in working on different facets of climate change issues and their institutional linkages, analysis of specific challenges and ongoing capacity building efforts provide a valuable and useful basis for further interventions.

This assessment was primarily aimed at compiling information that would be useful to USAID/Vietnam as they proceed with the programming of additional bilateral development assistance in the areas of climate change adaptation and landscape based mitigation of GHG emissions and enhanced sequestration of carbon. The specific details of interventions to be funded will be identified in follow on project design missions. At this point in the process, in terms of the orientations for options to be considered by USAID as they develop more specific project designs for programming development assistance in the areas of climate change adaptation and sustainable landscape, the assessment team recommends that USAID/Vietnam take account of the following considerations and findings from the assessment:

1. Build on the ongoing initiatives supported through a ***multi-agency approach***, and seek out additional opportunities to leverage further data collection and analysis and capacity building in critically important areas such as disaster preparedness and adaptation planning, especially for populations likely to be dislocated or severely impacted by severe storms and short term disruptions of water supplies, cropping systems and livelihoods, as well as by sea level rise and other long term climate change impacts;

2. Reinforce and expand newly launched activities to assist Vietnam in the analysis of low carbon / ***low emissions development strategies***, with particular attention to the opportunities to mitigate carbon emission from increased efficiency and conservation of energy use, the expansion of renewable energy production, reduced deforestation and degradation and integrated landscape level interventions aimed at carbon sequestration, increased productivity of natural resources, improved water resources management and sustainable agricultural development
3. Collaborate with MONRE, MARD and partners engaged in ***water resources management*** to implement the programs outlined in the NTPs for responding to climate change, improving water resources use and rural water supply and sanitation, with particular attention to continued efforts in the Mekong delta and expanded efforts to upgrade water storage and irrigation and water supply networks in the Red River delta; integrate measures aimed at improved water resources management and more secure water supplies as part of coastal zone and upland landscape level interventions
4. To effectively counter the major drivers of deforestation and forest degradation, join the partnership formed to ***implement REDD+*** in Vietnam and to reinforce Vietnam's global leadership and pioneering approaches in operationalization of REDD+; identify champions of more efficient, effective, transparent and equitable sharing of REDD+ benefits to rural communities and fully integrate such payment systems into landscape level interventions aimed at more sustainable land use aligned with participatory visioning and development planning, and investments in increased natural resources productivity and diversified livelihood opportunities as well as reinforced forest protection and conservation; actively explore opportunities to move beyond donor funded payments for forest protection to sustainable, market based carbon finance tied to local performance in carbon sequestration and improved management of forests and other natural resources and associated ecosystem services
5. Continue to work with MARD and Provincial Committees to scale up the application of the newly adopted ***Payment for Forest Environmental Services*** (PFES) decree to add value to forest land use and to compensate for the provision of ecosystem services in ways that help offset the opportunity costs of forest conservation and counter pressures to convert forest land to other uses with high rates of economic returns; particular attention should be given to the integration of PFES with the operationalization of REDD+ and the development and "layering" of additional carbon financing and PES schemes to further increase the economic returns from sustainable land use; consult with MONRE, MARD, ARBCP, GTZ and REDD teams regarding the prioritization of provinces for PFES extension and opportunities, taking into account the incidence of rural poverty, location of current or planned hydropower and water supply infrastructure investments, allocation of lands for community based management, land use pressures and opportunity costs of forest conservation, and forest resource conditions and degree of threat from deforestation and degradation
6. Build on the valuable experience gained from numerous pilot projects and expand support for ***scaling up integrated interventions*** aimed at poverty reduction and local empowerment within a framework of participatory land use planning and strengthening of local land and resource rights; reduced transaction costs and more equitable benefit sharing from PFES, REDD+ and

other conservation payment mechanisms; expanded extension and increased adoption of biogas, agroforestry, soil and water conservation, reforestation, diversification and intensification of crop production systems including the introduction of drought resistant varieties, upgrading of water storage and small scale irrigation and water supply infrastructures and other watershed management and rural development interventions

7. Support the MARD Action Plan and programs to protect, replant, regenerate and improve the management of ***coastal mangrove ecosystems*** as a means to reduce the vulnerability of coastal communities and protect their homes, agricultural lands and infrastructure from severe storms, secure and expand associated local livelihoods including fisheries, reduce deforestation and the degradation of critically important ecosystem services and increase carbon sequestration; adopt policy and regulatory reforms to carefully scrutinize any further conversion of coastal mangroves and rice production areas to shrimp aquaculture
8. Promote the elaboration and development of action plans to capitalize on the potential of ***bamboo*** and other environmentally sustainable and climate change friendly alternative livelihoods to be promoted in lieu of cassava, rubber and other cash crops that contribute to a loss of biodiversity, reduced watershed protection benefits and increased vulnerability for the rural poor to the negative impacts of climate change; explore opportunities to incorporate sustainable production of perennial crops, biodiversity conservation and ecotourism into sustainable landscape interventions
9. Recognize the connections between rural poverty and climate change vulnerability; in designing landscape level interventions aimed at sequestering carbon and reducing deforestation and forest degradation, fully capitalize on opportunities to reduce vulnerabilities of the rural poor through associated ***poverty reduction*** interventions and to facilitate climate change adaptation by ensuring that reforestation and forest conservation efforts are linked to more broadly based efforts to implement participatory, community based improvements in natural resource management with full attention to ***gender*** and the participation of women***, ethnic minorities*** and the poorest households, increased security of land and resource tenure, and expansion of opportunities to add value from increased resource productivity and local investments for value added processing and increased market access that directly benefit resource users investing in environmental conservation and sustainable use
10. Explore opportunities to integrate climate change interventions with improved ***environmental protection*** at the landscape level, with particular attention to mobilizing investments and supporting policy and regulatory reforms to address water pollution and ensure treatment of industrial effluents and other wastes negatively impacting water supplies, environmental quality and health.

Recommended Institutional Linkages and Training Priorities

As USAID moves ahead with programming of its climate change related development assistance, the team recommends close collaboration with MONRE, CTU and other universities working with ongoing US Government agency initiatives. It will also be important to work closely with the concerned departments of MARD, its research institutes, NGO partners and local communities, and to participate in the active networks and working groups engaged in planning and programming of climate change programs, including REDD+, the US-Vietnam Climate Change Working Group, Forecast Mekong and the Dragon partnership, the REDD Network , the Forest Sector Support Partnership and the NGO Climate Change Working Group. These networks offer an excellent opportunity for USAID and its project implementing partners to share information, coordinate interventions, leverage resources and to increase the effectiveness of USAID development assistance resources.

USAID's climate change assistance can capitalize on proven commitment by the national government to respond to climate change, as well as widespread and increasing public awareness and desire to adapt to and mitigate climate change. Reinforced and expanded communication and capacity building efforts in support of climate change programs should aim to facilitate a shift in perceptions, particularly among government decision makers that are inclined to view climate change as an "environmental" issue that can and will be addressed after further progress in economic development. Climate change can rightfully be recognized as a critically important economic development issue – as a failure to fully address the negative impacts of climate change is likely to undermine recent advances in poverty reduction and could compromise the benefits of further economic development efforts. As noted in numerous climate change vulnerability assessments, the rural poor and people dependent on natural resource based livelihoods are likely to be the most vulnerable and in the greatest need of assistance to adapt to climate change. Climate change programs must fully integrate a focus on poverty reduction and sustainable use of natural resources.

The participation and governance aspects of effective climate change programs should also not be overlooked. For economic development to be successful and sustained, a consideration of climate change must be mainstreamed into decentralized development planning and implementation programs. As noted in the Oxfam report on climate change, adaptation and poor people in Vietnam,

> …"experience in more than 100 countries around the world shows that a combination of active citizens and effective states is the best way of securing development and poverty reduction. Active citizens are an essential ingredient in making states work effectively to end poverty, and effective states which manage the process of development are essential to a country's prosperity and to social justice. Such a combination is also the best way of preparing for climate change." (Oxfam, 2008, Viet Nam: Climate Change, Adaptation and Poor People)

The following training priorities emerged in discussions with assessment team:

- support for increased transparency and accountability in allocating forest land and resource rights, and in providing and reporting on benefit distribution and the effectiveness of payment systems

- training in PFES concepts, systems and operationalization of payment schemes
- capacity building for water resources planning and management
- institutional strengthening for coordinated and decentralized early warning and disaster assistance planning and management
- increased technical capacity for greenhouse gas inventory and monitoring, analysis and reporting of forest cover change and field level support for improved forest resources management
- further development of centers of excellence for climate change science, modeling, scenario analysis and program planning
- support for economic modeling and analysis, particularly with regard to the costs and benefits of low carbon / low emissions development options, and the least cost pathways to reduced emissions with increased economic and environmental co-benefits
- support for policy dialogue and capacity building for the analysis of drivers of unsustainable use of land and other natural resources, and options for reinforcing economic and institutional incentives to promote desired behavior changes in support of sustainable resource use, climate change adaptation and mitigation and poverty reduction

Prioritization of USAID Climate Change Interventions

As the level of funding for USAID/Vietnam climate change assistance may vary, the team recommends a consideration of the following sets of prioritized interventions. These sets of interventions are not based on the estimated costs of each activity, but rather grouped in a way to maximize the aggregated people-level impact of resources mobilized by USAID. The lower budget options include the higher priority interventions that USAID could make to most directly impact the lives of the people of Vietnam in a cost effective way. These measures are the most likely to produce positive impacts in the short and medium term that directly reduce the vulnerability of targeted populations and enable them to adapt to climate change while contributing to climate change mitigation. The higher budget options include activities that are likely to be useful and pay dividends in the longer term, and could be considered if sufficient resources are available. Depending on the overall level of funding available, the following interventions may be supported:

Lower budget options:

- seek to maximize people level impacts and benefits, targeting the most vulnerable populations in rural areas; support decentralized approaches to address the root causes of poverty, and to increase security of food and water supplies in ways that contribute to environmental conservation, with reduced reliance on major infrastructure investments
- promote an integrated landscape level intervention that leverages local participation and investment in supporting locally determined high priority interventions to assist with adaptation, with particular attention to improved water supplies, increased storage and more efficient use of water and integrated watershed protection and management
- promote the extension and support of participatory approaches to restoration, regeneration and improved management of soil fertility, trees and forests across targeted landscapes, in association with livelihood enhancement and poverty reduction interventions

- integrate locally targeted information – education – communication campaigns
- integrate scaling up of in kind payments or locally generated exchanges for conservation and ecosystem services, as well as PFES and REDD+ payments
- target coastal lowland areas and steep, forested uplands with high concentrations of rural poor

Medium budget options

- increase investment in infrastructure and improved practices needed to improve water resources management, control floods, increase water storage and efficiency of water use, and reduce water shortages in the low flow /dry season
- integrate increased attention to national policy and regulatory frameworks and market based incentives to control sources of water pollution and to leverage private and local investment in effluent treatment
- expand scope of landscape based interventions to reinforce community forestry and improved forest management, and to incorporate assistance with promotion of biogas use and forest based enterprise development
- further strengthen communication interventions to include more attention to decentralized disaster preparedness and planning and development of early warning systems
- address other priorities for USAID environment strategy IR 2 and illustrative activities in support of improved water resources management

Higher budget options

- increase level of support for development of centers of excellent for climate change science, and associated capacity building, long term training and networking
- increase direct investment to address pollution and protection of environmental quality, particularly with respect to water supplies
- increase investments in coastal and lowland dykes and interventions to address severe storms, sea level rise, salt water intrusion and associated population dislocations
- address other priorities for USAID environment strategy IR 1, IR 3 and IR 4 and illustrative activities in support of strengthened response to climate change, biodiversity conservation and control of environmental pollution

Annex A. Summary Description of Climate Change Assessment

Objectives:

The Vietnam Climate Change Assessment is being prepared by USAID/Vietnam to guide the programming of USAID funded development assistance in the areas of "adaptation" and "sustainable landscapes". This assessment will examine needs, opportunities, national level priorities, potential geographic areas of focus and the roles that other donors and organizations are playing with regard to climate change adaptation and landscape-based mitigation. This assessment will provide an overview of the issues and set the stage for follow on USAID project design and preparation activities.

Background:

USAID funding for adaptation is aimed at strengthening communities to reduce their vulnerability and increase their resiliency to climate change impacts. Sustainable landscape funding is being mobilized to help countries to reduce emissions deforestation and forest degradation and to increase carbon stocks while supporting poverty reduction. This could include assistance with building capacity to monitor and assess forest carbon changes and to improve governance, policies and the enabling environment for REDD+ investments as well as promoting synergies with improved natural resource management, more sustainable agricultural land use, food security and related rural development activities.

Proposed Assessment Activities:

The assessment team is tasked with the following principal activities:

- Meet with key stakeholders to discuss recently completed, ongoing and planned climate change activities in Vietnam including those supported by the Government of Vietnam, donors and NGOs
- Review relevant documentation about major economic, social and environmental issues facing Vietnam in relation to climate change vulnerabilities
- Undertake consultations and field visits to determine needs, challenges and opportunities related to climate change adaptation and landscape-based mitigation
- Summarize Government of Vietnam priorities for addressing climate change, based on current strategies, programs and commitments
- Recommend broad potential areas of USAID support to the Government of Vietnam on climate change adaptation and sustainable landscape activities

Timetable:

The Vietnam Climate Change Assessment will be carried out in three phases. The first phase is scheduled from November 1-20, 2010 and includes a series of initial meetings and consultations with government stakeholders and organizations working on climate change adaptation and mitigation. A second phase scheduled in December 2010 will include additional consultations and field visits. The final phase of report preparation, review and finalization will be completed in January 2011.

Assessment Team:

The assessment team will include USAID and the US Forest Service specialists with expertise in climate change vulnerability and adaptation assessments, natural resource and forest policy, community forestry, sustainable landscapes program development, forest inventory, risk mapping for flooding and drought and a national facilitator / counterpart coordinator.

Key Questions / Topics of Discussion:

1. Key findings related to prior assessments of climate change vulnerabilities, including impacts on household incomes and poverty reduction, rural livelihoods, food security, water resources, biomass fuels and disaster management
2. Recent analysis of needs or opportunities for adaptation and landscape-based mitigation
3. Latest developments on forest inventories and forest cover mapping, land use assessments and mapping, tenure and property rights for agriculture, forestry and environmental management
4. Major priorities, goals, strategies and plans in support of climate change adaptation and sustainable landscapes
5. Recent progress and plans to reduce vulnerability and increase adaptation to climate change, particularly with respect to sustainable agricultural production and natural resource based livelihoods, improved land use and natural resource management
6. Issues, challenges and opportunities related to governance, policy and enabling conditions for REDD+ investments and equitable distribution of revenues and benefits from carbon finance and payment for ecosystem services
7. Geographic areas appropriate for REDD+ and associated efforts to reduce emissions through forest conservation and sustainable forest management
8. Ongoing or proposed capacity building and related efforts to assist with forest carbon monitoring, reporting and verification
9. Perspective on major unmet needs and opportunities for promoting synergy, collaboration and leveraging of USAID investments in adaptation and sustainable landscapes
10. Key institutional contacts for coordination and technical support of adaptation and landscape based mitigation activities, and sources of additional information that would be relevant for USAID project design and preparation in the areas of climate change adaptation and landscape-based mitigation

For more information, please contact:

USAID: Howard R. Handler, USAID/Vietnam, tel 3935 1244, Bart Lounsbury, jLounsbury@usaid.gov

US Forest Service: Darcy Nelson dgnelson@fs.fed.us, Bob Winterbottom rtwinterbottom@gmail.com
mobile: 01885616739

Annex B. Schedule of meetings, persons contacted and field visits

Schedules	Institutions	Topics
Fri. 5 Nov.		
9.00 - 11.00	Forest Institute for Planning and Investigation (FIPI)	Forestry inventories, GIS application
Mon. 8 Nov.		
9.00	GRET	
13.30 – 15.00	Forestry Directorate (Forest Development Department)	Forest plantations
15.15 – 16.30	Forestry Directorate (Forest Protection Department)	Legal / illegal logging
17.00	USAID (Howard)	
Tues. 9 Nov.		
10.00 – 11.30	Mr. Trinh Le Nguyen Director of Panature Tel: 0912095045	Climate change issues
1.30 – 2.00	JICA (Mr. Taro Katsurai)	
Wed. 10 Nov.		
8.00 – 9.00	AITVN (Asia Institute on Technology of Vietnam) Dr. Nguyen Huong Thuy Phan (DT: 0912072082)	Climate change study/research and education
9.15 – 10.30	WWF	Opportunities to promote community conserved areas in regions with natural forest cover threatened by unsustainable logging and conversion to agriculture or other land use
12.15	David Bonnardeaux	
16.00 – 17.00	Center for Sustainable rural development (SRD)	
Thur. 11 Nov.		
10.00 – 11.30	CARE (Ms. Yen)	
15.00 – 16.30	Legislative Department	PES

Fri. 12 Nov.		
8.30 - 10.00	Vietnam Wood and Forest Products Association (Mr. Nguyen Ton Quyen, Vice-Chairman)	Wood import (both natural and planted one)
10.30 - 12.00	Vietnam Forestry Sciences Institute	Control of disease outbreaks (in forests)
15.30 – 16.30	FSSP – Mrs. Van	Needs, opportunities for improved conservation, restoration of forest resources in context of REDD and "sustainable landscapes" initiatives
Mon. 15 Nov.		
8.00 - 13.30	Low Carbon Vietnam dialogue	
14.00 – 15.30	Standing Office on Climate Change – MARD	MARD Action Plan on Climate Change
Tues. 16 Nov.		
9.30 – 11.00	JICA	
16.00 – 17.00	Forest Trend (Mr. Phuc)	
Wed. 17 Nov.		
9.00 - 10.30	Mr. Patrick Laake, UN-REDD	Potential role for USAID to address barriers in implementing REDD
13.30 - 14.30	FORMIS project (Finland) Tapio Leppänen, CTA	REDD
16.00	Leave for Noi Bai Aiport (Flight to HCMC at 18.00)	
Thus. 18 Nov		
8.30 – 9.30	ARBCP (Winrock International)	
10.00 – 11.30	Southern Water resources Planning Institute	
13.30 - 15.00	Climate change Research Center (Thu Duc Agro-Forest University)	
15.30 - 16.30	Forest inventory and planning sub-Institute	
Fri. 19 Nov		
7.30	Leave for field visit	

9.00 - 10.00	Meeting with the Can Gio Protection Forest Management Board	
10.00 - 11.30	Visit Can Gio Mangrove forests	
	Fulbright Center (optional, if time allows)	
Schedules	**Institutions**	**Remarks**
Wed. 8 Dec.	Arrival	
9 - 11 Dec.	Field trip	
Sun 12 Dec.	Return to Hanoi	
Mon 13 Dec.		
9.00 - 10.30	Forest Institute for Planning and Investigation (FIPI)	
11.00	Meeting with Howard and Eric	
13.00 - 14.00	Forestry Directorate (International Cooperation and Science Technology Dept.)	UN REDD Focal Point
15.15 - 14.30	Water Resources Directorate (Water resources management Department)	
Tue 14 Dec.		
8.30 - 10.00	GTZ	Mr. Hung
10.15 - 11.30	FORMIS	Mr. Tapio CTA
8.00 - 9.00	Warecod: local NGO on community based water resources management (Ms. Khanh: Deputy Director : 0912713229)	*For Mark*
9.30 – 11.00	RECOFTC	Dr. Tan (country coordinator) *For Mark*
13.00 – 16.30	Roundtable Meeting on UN REDD	
Wed 15 Dec		
9.00 - 10.30	Vietnam Academy for Water Resources Sciences	Contact: Mr. Hai 0913381563

10.45 - 11.30	University of Water Resources	Contact: Ms. Huệ 0988083894
13.30 - 15.00	Water supply & sanitation Center	
8.30- 12.00	Rountable Meeting on UN REDD	
Thu 16 Dec		
AM	Workshop on Climate Change Impacts to agro-production	
Fri 17 Dec		
9.00 – 12.00	Roundtable Meeting	
Sun 19 Dec		
PM	Departure to Ho Chi Minh for field visit	*For Mark*
Mon 20 Dec		
9.00 - 11.00	Meeting with USAIS Office in Vietnam	*For Bob*
21.00	Departure to the US	
7.00	Leave for Tien Giang province	*For Mark*
9.00 - 12.00	Visit Go Cong Dong and Go Cong Tay Irrigation System	Contact: A. Huynh 0903330514
	Visit Sea Dike system in Tien Giang	
PM	Back to Ho Chi Minh city	
Tue 21 Dec		
8.30 - 10.00	Southern Water Resources Sciences Institute	Contact: A. Thắng 0913926027
10.15 - 11.30	Southern Water Resources Planning Institute	Contact: A. Tiến 0913700899
14.00 - 15.00	Meeting with Winrock International Office in HCM city	
PM	Back to Ha Noi	
Wed 22 Dec	Departure to the US	

Annex C: Illustrative activities identified in USAID Strategy for climate change and environmental programs

Intermediate Result 1: Strengthened Response to Climate Change

- Technical assistance to improve policy and legal framework to address climate change
- Technical assistance for assessments to support planning for climate change adaptation for population dislocations and economic disruptions
- Disaster assistance for extreme weather events
- Improve monitoring, evaluation, and early warning systems
- Technical support for Vietnam's Participation in a Greater Mekong Sub-region Climate Change Agreement
- Clean energy and energy conservation

Intermediate Result 2: Water Resources Management Improved

- Support streamlined water sector institutional arrangements;
- Improve capacity for determining basin level impacts of climate change on water resources;
- Incorporate results of predictions into management plans;
- Support development of water use permitting procedures based on management planning;
- Support implementation of NTP for rural water supply and sanitation;
- Support implementation of the NTP on water resources;
- Promote climate resilient fisheries sector reform.

Intermediate Result 3: Marine and Terrestrial Biodiversity Enhanced

- Support implementation of new biodiversity law;
- Development of Coastal Zone Management Plans;
- Planning for Marine Protected Areas;
- Reduce Illegal wildlife and timber trade;
- Habitat Protection and Restoration;
- Payment for Environmental Services;
- Capacity building for climate resistant agriculture and forestry, particularly in the Mekong Region;
- Mekong focused mangrove restoration.

Intermediate Result 4: Environmental Pollution Effectively Controlled

- Technical assistance to support national level legal, regulatory and institutional reform;
- Environmental remediation of dioxin/Agent Orange;
- Environmental Monitoring and Enforcement Capacity Building;
- Promotion of Pollution Prevention through adoption of Clean Technologies;
- Improved management of extractive industries;
- Strengthen capacity of craft villages to operate in an environmentally sustainable manner.

Annex D : Roundtable Meeting Agenda and Summary

USAID / Vietnam Climate Change Assessment – Roundtable Meeting - 17 December 2010

Agenda

Co-Chair: Mr. Luong The Phiet, DG of ICD / MARD
Mr. Howard R.Handler, Director of USAID Office in Vietnam

Time	Activity	Responsible
8.30 – 9.00	Registration	
9.00 – 9.10	Introduction to the workshop objective, participants and expected outputs	ICD / MARD
9.10 – 9.20	Opening remarks	Mr. Luong The Phiet ICD / MARD
9.20 – 9.30	Opening remarks	Mr. Howard R.Handler USAID
9.30 – 10.15	Presentation of the assessment findings and recommendations	Bob Winterbottom - Assessment Team Leader Mark Weinhold - Hydrology, White River NF Tom Brandeis - Inventory, SRS-FIA
10.15 – 10.45	Coffee break	
10.45 – 11.45	Plenary discussions	
11.45 – 12.00	Summary and next steps	ICD/MARD and USAID
12.00	Lunch hosted by USAID	

Invited Participants

Representatives of:

MARD – Dir of Water Resources, Dept of Forests, REDD+ Focal Point, Dept Science & Tech, FAO, CARE, SNV, RECOFTC, Winrock ARBCP, Center for Sustainable Rural Dev., GTZ MONRE, IMHEN, Forest Science Institute, FIPI, FSSP, UN-REDD, Forest Trends, Vietnam Timber and Forest Product Assoc., AIT-VN, CCRD, IUCN, WWF, PanNature, World Bank, DFID, FINNIDA, other major donors

Summary of Discussions

Mr. Luong The Phiet, DG of ICD/MARD co-chaired the Round Table and opened the event with welcoming remarks. He noted the recent agreements on interventions to address climate change that were reached at COP 16 in Cancun, and underscored the importance that the Government of Vietnam is giving to programs addressing climate change, as Vietnam is one of the five most seriously affected countries worldwide. He noted that 10% of the area of Vietnam could be inundated by sea level rise and climate change could seriously impact millions of people and adversely affect the country's GDP. Accordingly, it is an important mission of the GVN to mitigate and to respond to the threat of climate change.

Mr. Howard Handler of USAID/Vietnam and co-chair of the Round Table joined Mr. Luong in warmly welcoming all of the participants and joined him in reiterating the primary objectives of the Round Table outlined in the documentation provided to each participant. Mr. Handler noted that USAID expects to program $5.5 million in the coming year and a similar level of assistance in the following year in the areas of climate change adaptation and mitigation. He encouraged feedback on the presentation of the preliminary findings of the climate change assessment team and a good dialogue in order to assist in identifying the most important and relevant areas for intervention with the assistance of USAID.

Mr. Bob Winterbottom was then invited to summarize the preliminary findings of the assessment team in collaboration with the other team members (see Powerpoint slides). The participants were then encouraged to comment and ask questions, and the following points were made:

Peter Newsum, Country Director of CARE International:

- The team brought together a great deal of information in a short period; useful to take a holistic approach to interventions aimed at addressing climate change
- Important to link actions addressing climate change with poverty reduction, and to associate income generating activities in field level implementation, as recommended by the team
- With additional funding, the localized interventions cited by the team could be scaled up

Dr. Pham Manh Cuong, Focal Point, National REDD+ Program, MARD

- Rubber does bring high returns, but if rubber plantations replace natural forest, biodiversity and environmental services are decreased, so we should be wary of seeing

an increase in forest cover as a positive trend when it includes an increased proportion of rubber plantations

- He noted the onset of collaboration between Vietnam and the US launched in 2008, when a climate change working group was formed under the bilateral science and technology cooperation agreement. Also in 2008, USGS and Can Tho University launched the DRAGON Institute. He encouraged the development of further cooperation, now that Vietnam has been designated as a pilot country for the preparation of a LEDS strategy with US assistance; the Minister of MARD would like to visit the US next year, and MARD is keen to work with USAID to fill some gaps in support for REDD+; Dr. Cuong then noted the need for support in the area of policy formulation and in providing investment to support the adoption of improved practices at the local level
- To make PFES and REDD+ more sustainable, it will be important to allocate longer term land rights and a higher level of economic incentives to more households and local communities; much of Vietnam's forest land is still allocate to state forest enterprises and most household only have relatively short term contracts and only a modest level of payments to encourage reforestation and forest conservation
- He also noted the need for additional assistance in the area of MRV for REDD+ to explore opportunities for an equitable benefit sharing system in support of REDD+ and associated MRV activities
- He agreed that it is important to increase support for mangrove restoration and conservation, and for the improved management of mountain forests, and noted the value of a "sustainable landscape" approach, with a comprehensive package of interventions aimed at improved forest management, sustainable agricultural production and poverty reduction
- Dr. Cuong also noted the importance of education – and funding of additional actions to support capacity building; the team recognized the importance of capacity building as an integral activity, and that useful discussions and specific suggestions had arisen from meetings with AIT-VN, RECOFTC, the Fulbright Center / Harvard Univ in HCMC, and other university programs as well as with NGOs implementing field projects. (Note: the LEDS team also concluded that Vietnam needs to build capacity in key climate change mitigation skills and that an opportunity exists to achieve multiple objectives under the initiative through support for institutional capacity-building in government, universities, and NGOs.)

David Bonnardeaux, Winrock – Asia Regional Biodiversity Conservation Project.

- Given the positive experience and useful lessons (e.g. need for a strengthening of tenure and payment arrangements) gained from the pilot Payment for Forest Environmental Services (PFES) pilot supported by ARBCP in Lam Dong Province, and now that MARD is preparing to roll out a Master Plan for scaling up PFES to 15 Provinces, this is a definite opportunity for the new USAID funded activity
- Regarding bamboo, MARD has asked Winrock for support with the preparation of a Bamboo Master Plan and supporting policies, as it is an important forest and income-generating crop – and this type of support could also be included in the new project.
- As mentioned during the team's presentation, following the surveys and workshop on the impact of climate change on crop production that was recently organized with the Dept of Crop Production with support from ARBCP, it would be opportune to consider funding of a range of applied research and other field level activities aimed at increased food security through assistance with climate change adaptation; this could include assistance with conservation tillage, early warning systems, vulnerability mapping as well as longer term support for drought resistant crop varieties, etc.

Dr. Nguyen Quang Tan – Country Program Coordinator, The Center for People and Forests - RECOFTC

- While climate change is having some impacts on crop production, the high value of imported maize and soy bean is driven by the demand for livestock feed
- While there is definitely much scope for scaling up local level interventions through investments at the commune level, it is also important to continue to support the further elaboration of supporting policies and improvement of national level enabling conditions for such local level actions
- It would be good to clarify how the team is recommending support for REDD+ and how the new USAID project could help to operationalize REDD+, in addition to support for mangrove restoration, reforestation, sustainable land use and improved NR management in conjunction with scaled up PFES, etc.

Richard McNally, REDD+ Coordinator / Asia, Netherlands Development Organization – SNV

- In keeping with the illustrative examples outlined for USAID Sustainable Landscapes project funding, it would be good for the team to consider needed interventions in

Vietnam to assist with carbon market readiness, and additional support for the analysis of the drivers of deforestation and needed economic incentives for sustainable forest land use and improved forest resources management

To Thi Thu Huong, Forestry Programme Coordinator, GTZ

- It will be important to consider how best to provide feedback to the level of policy formulation from local field level experiences
- Community based mangrove restoration is an area of particular interest to GTZ and an opportunity for collaboration with USAID, as was done in support of PFES pilots
- The full legal basis for scaling up PFES is now in place and additional resources are needed to implement these activities and to integrate PFES into REDD+ and support for participatory watershed management

Dr. Thomas J. Brandeis, USDA Forest Service, SRS-FIA

- Mobilizing additional support for sustainable forest management is an effective means to reduce deforestation and forest degradation and to move ahead with REDD+ implementation;
- With respect to national forest inventories and support for REDD+ MRV, Vietnam is making steady progress and moving in the right direction with considerable support; the US could assist with sharing of experiences and technical exchanges

Dr. Le Hung Nam, Deputy Director, Directorate of Water Resources, MARD

- Several observations made and noted by the team on slide 10 (climate change impacts in relation to water resources)
- Programming of assistance by USAID for water resources management is important and timely, especially in the following areas:
    - US based training for water resources engineers
    - Further assistance to help with the management of droughts as well as floods
    - Analysis of changing flood patterns and means to adapt to these changes
    - Assistance in organizing interventions to resolve problems from thousands of earthen dams constructed without spillways that are at risk of collapsing with changes in river flows and flooding

- Assistance with the further elaboration of policies and rules to manage hydraulic structures for irrigation, flood control, water supply, hydropower, to upgrade management of low water flow and to improve operations
- Assessment of needs for intervention in the Red River basin (to address issues of drought, low water flow, earthen dams without spillways, etc), to complement the existing geographic focus by many other donors (Netherlands, World Bank, JICA) on flooding and sea level rise in the Mekong delta

ICD, MARD

- MARD is preparing their Action Plan for Climate Change Adaptation and Mitigation for 2011-2015, and it would be good to clarify and agree with MARD on approaches to be supported in the USAID project
- Emphasis should be placed on ensuring the full participation of stakeholders, mobilizing investments at the local level and on raising awareness at the grass roots

Next Steps

At this point, Howard Handler or USAID intervened to respond to questions about "next steps". He briefly outlined the process for finalizing the assessment report, organization of a project design team and additional steps in the project preparation and approval process which would be needed to commit funds and to move ahead with a new climate change project. It would be important for this new project to fit with government priorities including close alignment with ongoing and planned support to the National REDD+ Program, and to complement other related funding from other donors. USAID will also ensure that this project dovetails with USAID assistance provided regionally (through RDMA), and seek to find a balance between building on successful pilots to support local level implementation, and further capacity building and assistance with national policy formulation and a strengthening of the enabling environment for climate change adaptation and mitigation.

Summary and Conclusion

After a brief summary of the key points that emerged from the dialogue and noted above, the Co-Chairs then warmly thanked all of the participants for the many excellent and constructive comments, questions and suggestions, and wished everyone well and a happy holiday.

Annex E. List of references and documents consulted

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