Comprehensive environment and climate change assessment in Viet Nam

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Acronyms

ADB	Asian Development Bank
ARD	agriculture and rural development
CBDRM	community-based disaster risk management
COSOP	country strategic opportunities programme
DARD	provincial department of agriculture and rural development
DRM	disaster risk management
GHG	greenhouse gas
GSO	General Statistics Office
ICD	International Cooperation Department (MARD)
IFPRI	International Food Policy Research Institute
IMPP	Improving Market Participation of the Poor
ISG	International Support Group (MARD)
JICA	Japan International Cooperation Agency
MARD	Ministry of Agriculture and Rural Development
MOF	Ministry of Finance
MOIT	Ministry of Industry and Trade
MOLISA	Ministry of Labour, Invalids and Social Affairs
MONRE	Ministry of Natural Resources and Environment
MPI	Ministry of Planning and Investment
NTP-NRD	National Target Programme-New Rural Development
NTP-RCC	National Target Programme to Respond to Climate Change
PES	payment for environmental services
PFES	payment for forest environment services
RCC	Response to Climate Change
RCC-ARD	Action Plan to Respond to Climate Change in the Agriculture and Rural Development Sector
REDD	Reducing Emissions from Deforestation and Forest Degradation
SEDP	Socio-Economic Development Plan
SP-RCC	Support Programme to Respond to Climate Change
SRES	Special Report on Emissions Scenarios
VND	Vietnamese dong

Foreword

Viet Nam has made impressive advances in poverty reduction over the last two decades. However, the impacts of climate change are increasingly threatening to undermine those gains. In light of this challenge IFAD undertook a comprehensive environment and climate change assessment to inform the preparation of Viet Nam's country strategic opportunities programme 2012-2018 (COSOP). The assessment helped orient IFAD's proposed investments of approximately US$75 million to address the core environment and climate change challenges facing rural poor people and smallholder farmers. This publication provides a synthesis of that assessment, highlighting the disproportionate negative impacts of climate change on the rural poor and smallholder farmers.

In addition to informing the overall strategic orientation of the COSOP, the assessment enabled the design of a project that addresses the specific climate change impacts in the Mekong Delta. The project amounts to approximately US$49 million, which includes a US$12 million grant from IFAD's Adaptation for Smallholder Agriculture Programme. This new programme, launched by IFAD in 2012, aims to channel climate and environmental finance to smallholder farmers through IFAD-supported projects and country programmes. It funds projects that help increase adaptive capacity to contend with climate change while increasing food security, reducing poverty, preserving biodiversity and lowering greenhouse gas emissions. The programme enables IFAD to scale up tried-and-tested approaches such as drought and flood risk management, mixed crop-and-livestock systems, introduction of drought-tolerant and salt-tolerant crop varieties, integrated water resources management, land regeneration, agroforestry and improved post-harvest storage, to name a few.

The programme also introduces new strategies, including analysis of climate vulnerability and capacity of rural communities; climate modelling for long-term planning, policy development and budgetary allocation; and empowerment of district, provincial and national institutions to better engage in rural development and climate policy formulation.

The Viet Nam COSOP development exercise indicates that a comprehensive analysis and assessment of environment and climate challenges enables better programming of IFAD and country resources. In this regard, I believe the findings and recommendations of this study will be of interest to a wide audience, including country programme managers, development practitioners and policymakers supporting national priorities on climate change and sustainable development. It is anticipated that Viet Nam's 2012-2018 COSOP will provide a vehicle for engendering an incremental shift towards adoption of a rural development model that is environmentally sustainable, climate resilient, socially equitable and supportive of inclusive growth that is profitable to smallholders.

Executive Summary

This document summarizes the working paper *Viet Nam – Climate Change Analysis And Adaptation Responses*, which was prepared for IFAD's country strategic opportunities programme (COSOP) 2012-2017. The working paper resulted from a series of workshops and field visits undertaken in the months leading up to the COSOP mission, in September 2011. During the mission itself, an IFAD climate and environment specialist and an international climate change consultant were integrated into the COSOP team under terms of reference focused on making IFAD's COSOP for Viet Nam climate smart.

Findings

Viet Nam is likely to be one of the countries most vulnerable to climate change and is likely to be significantly impacted by it. The Fourth Assessment of the Intergovernmental Panel on Climate Change characterized Viet Nam as a "hotspot of key future climate impacts and vulnerabilities…".

Irrespective of climate change impacts, Viet Nam is a natural disaster 'hotspot'. With the majority of the population living in low-lying river basins and coastal areas, it is estimated that more than 70 per cent of the population is exposed to risks from multiple natural hazards. Viet Nam ranks seventh globally on economic risk and ninth on land area and population exposed.

Projected climate change impacts on the agriculture and rural development (ARD) sector are reason for immediate concern. Many rice cultivars are already close to their heat threshold. Evapotranspiration rates will rise, increasing crop water usage and the damaging effects of drought. By 2050, rice yields could decline by 6 per cent to 42 per cent, and other crops by 3 per cent to 47 per cent. The sea-level rise predicted by 2050 would increase areas affected by flooding by 0.28 million hectares and areas affected by saline intrusion by 0.42 million hectares, and 0.59 million hectares of rice production area could be lost.

The nexus of poverty and climate change risk is of particular concern. Vulnerability to climate change is socially differentiated. Impacts of extreme weather events are related to poverty status, access to resources and social security systems. Groups that are already the most socially vulnerable (women, ethnic minorities and disabled people) are disproportionally less able to adapt. They are exposed to greater risk in that their livelihoods are generally based on agriculture and natural resources and they lack sufficient assets to recover or shift to alternative livelihoods.

Major conclusions

Principal adaptation strategies for households will include: Changes in sowing dates, switch to drought-tolerant crops, adoption of salinity-tolerant rice varieties, adoption of new crop varieties, switch to rice-fish rotations or mariculture, out-migration and wage labour. In aquaculture, adaptation will be difficult for smallholders and poor people due to high investment costs. In forestry, most adaptation measures will require direct facilitation by the Government. For flood and coastal protection, people will be largely reliant on government interventions to build and upgrade dykes and flood defenses. The other alternative is migration.

The Government's climate change frameworks offer good entry points for the ARD sector. The vision to 2050 is comprehensive, recognizing the needs of vulnerable populations. Notably, it recognizes that one size does not fit all and that flexible, locally adapted responses are needed. The 2011-2015 action plans, however, are unclear on how the vision will translate into appropriate local schemes. The focus is on infrastructure to combat sea-level rise, with little attention to strengthening capacity for local action and resilience. Poverty and food security are treated in a limited fashion.

IFAD can exploit a number of strong comparative advantages. Donor partners are reducing support for ARD and poverty alleviation. By focusing on pro-poor adaptation and mitigation, IFAD would support critical objectives that otherwise may not receive needed attention from the Government. IFAD also brings highly relevant knowledge, experience and institutional relations developed though its current portfolio. It has the institutional capital and recognition required to engage at all levels, from the field to the national level, and to create opportunities to support, influence and strengthen the Government's strategies and initiatives for climate change adaptation and mitigation.

The major opportunities for achieving effective and durable pro-poor responses to climate change lie in synergistically combining concerns for disaster risk management and climate-related risk/climate change threats into formal plans through local planning processes. This will take place through the Socio-Economic Development Plan (SEDP), which is the Government's principal planning instrument for public financing in the ARD sector. Thus, mainstreaming disaster risk and climate change management into the SEDP creates potential to institutionalize pro-poor, climate-smart development approaches and replicate them nationwide.

Knowledge management should be a central thrust of IFAD's support. IFAD projects, with their community presence and local experience and knowledge, should be exploited as part of efforts to develop systematic learning and knowledge dissemination processes for pro-poor, climate-smart agriculture and rural development. There is a high and unmet demand for this from national and local governments, NGOs and donor partners.

The focus should be on introducing bottom-up 'climate proofing' approaches and instruments. Both upward and downward linkages are weak. Planning instruments for climate-proofing ARD investments need to be put in place and linked from provincial-level sectoral planning to district-level operational (and land use and zoning) planning to commune/village level planning. At local levels, natural disaster risk and vulnerability reduction should be an integral part of the climate-proof planning process. Development of participatory land use plans is essential as are links to district land use planning so they can be utilized to orient institutional response and investment.

IFAD's targeting strategy should remain substantially the same. Sensitivity to climate-related risk/climate change is a direct function of social vulnerability. In Viet Nam, rural poor people are the most sensitive, and ethnic minorities, women and children are the most vulnerable.[1] In addition, poverty reduction is one way, if not the best way,

1 The IPCC Third Assessment Report (TAR) describes:
Sensitivity as: "the degree to which a system is affected, either adversely or beneficially, by climate-related stimuli. The effect may be direct (e.g. a change in crop yield in response to a change in the mean, range or variability of temperature) or indirect (e.g. damages caused by an increase in the frequency of coastal flooding due to sea level rise)."
Vulnerability as: "The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity." (IPCC, 2001, p. 995) (IPCC Def. 1).

to enhance household and community capacity for adaptation. To increase resilience, good ARD policies and programmes will be good adaptation policies and programmes.

The COSOP should give extra weight and consideration to the regions where sensitivity and exposure to climate-related risk/climate change threats are highest. In order of priority these are:

- Mekong River Delta: This region has the largest number of rural poor people and is likely to suffer the greatest impacts from climate change;
- Central Highlands: This region has very high rates of poverty, a large ethnic minority population and the prevalence of rainfed subsistence agriculture, making rural poor people especially sensitive to climate change risk and natural disasters. This zone also has high in-migration rates, which will increase with displacement of populations from coastal areas and the Mekong River Delta;
- Northern Mountains: This region has the highest rates of poverty and the largest ethnic minority populations, making it the area most sensitive to the impacts of climate change and natural disasters;
- Central Coast, both northern and southern, especially areas of ethnic minorities and poor communities dependent on fishing or rainfed agriculture: In the semi-arid south, water resources are scarce and drought is a severe limitation and risk factor. The structure of the economy is rapidly changing to industry- and service-based, and there are limited opportunities to enhance agricultural livelihoods over the long term.

IFAD's principal institutional partners for implementation should include: Ministry of Agriculture and Rural Development, for policy, coordination and prioritization of investment projects; Ministry of Planning and Investment, for integration of climate change considerations into the SEDP; Ministry of Natural Resources and Environment, for coordination of climate change response in the ARD sector; Ministry of Labour, Invalids and Social Affairs for integration of climate change concerns into local SEDP processes; provincial governments (people's committees at all levels); provincial departments of planning and investment for SEDP processes; provincial departments of agriculture and rural development for climate change adaptation in production systems and for implementation of community-based disaster risk management; and Japan International Cooperation Agency and the World Bank in the Mekong River Delta and the World Bank in the Central Highlands.

Introduction

This document summarizes the working paper *Viet Nam – Climate Change Analysis and Adaptation Responses*, which was prepared to inform IFAD's country strategic opportunities programme (COSOP) 2012-2017 for Viet Nam. Preparation of the working paper began with a brainstorming workshop held on 9 May 2011 in Hanoi. It brought together key national research institutes working on climate change and environmental issues; the Government's Ministries of Agriculture and Rural Development (MARD) and Natural Resources and Environment (MONRE); and bilateral and multilateral donors. The objective of the workshop was to acquire an overview of the current status of climate change as well as insights and research into climate change; understand the actual and emerging climate change policies, strategies and interventions relevant to the agriculture and rural development (ARD) sector; and identify potential gaps in understanding of specific climate change issues. Subsequently, three provinces in representative agroecological zones from IFAD's current (and assumed future) project pipeline were selected for a more detailed analysis of the on-the-ground impacts of current climate-related risk and potential future climate change impacts. The three target provinces are Tra Vinh, Ha Tinh and Ha Giang.

In September 2011 the IFAD COSOP Preparation Mission took place. The team included a climate and environment specialist[2] and an international climate change consultant, operating under terms of reference focused on making the COSOP 'climate smart'. The specialists worked with the COSOP design team to integrate and mainstream operational and investment strategies for addressing climate change concerns and risks into the COSOP. Team members visited the target provinces to help them learn how the provinces were addressing climate change issues in their development planning. Consultations were held with government and community representatives at district, commune, village and farm levels to discuss their experiences and concerns regarding the frequency of natural disasters and climatic extremes. Information was obtained on their immediate concerns as well as lessons learned and capacity for adaptive responses to the short- to medium-term threats posed by climate change. Such inputs were critical to ensuring that the proposed recommendations were consistent with local realities and would reflect the strategic objectives of the COSOP.

On 28 September 2011, MARD held a climate change policy discussion forum with IFAD support. MARD presented for public discussion its *Action Plan to Respond to Climate Change 2011-2015 with Vision to 2050*. MONRE also attended and presented its National Target Programme to Respond to Climate Change (NTP-RCC). Having the two ministries presenting and discussing with each other their climate change policy frameworks in an open forum was a first. The meeting was attended by representatives of key departments from both ministries, national and regional research institutes and universities, the Climate Change NGO Network and bilateral and multilateral donors. IFAD presented for discussion its preliminary analysis of climate change impacts on the ARD sector and possible priorities for IFAD intervention. Feedback and guidance from the participants were utilized to further refine the analysis and prioritize elements for mainstreaming into the COSOP. A policy issues note was drafted, which is helping to guide policy discussions on further strengthening the pro-poor aspects of adaptation to climate change in the ARD sector.

2 Mr. Roshan Cooke, Regional Climate and Environment Specialist, Asia and Pacific Region, Environment and Climate Division.

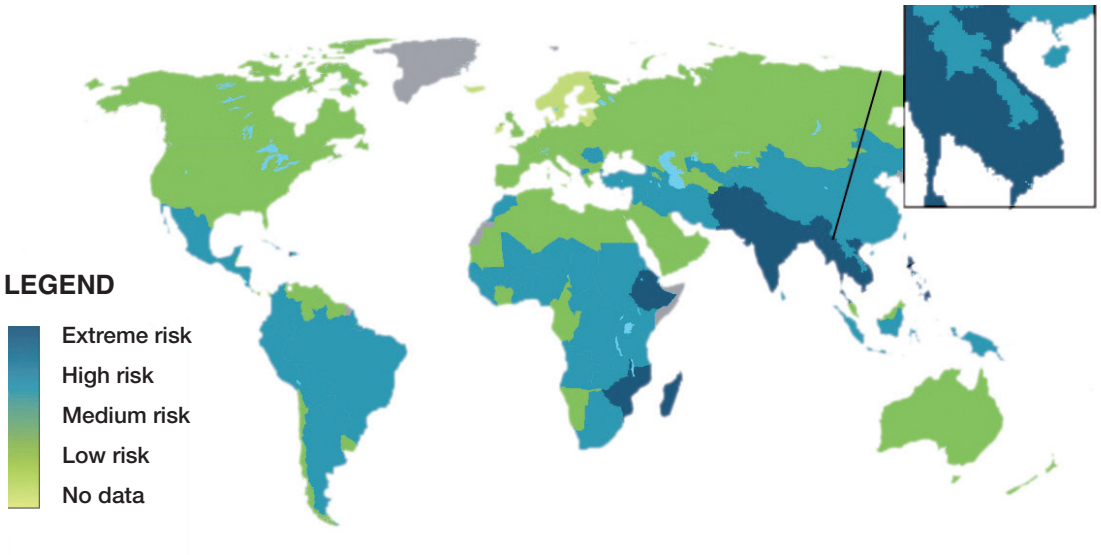
Predicted impacts of climate change in Viet Nam

Predictions suggest that Viet Nam will be one of the countries most vulnerable to climate change and likely to face significant impacts from it. Globally, it has been ranked as a 'natural disaster hotspot', ranking 7th on economic risk, 9th on the percentage of land area and population exposed, and 22nd on mortality from multiple hazards (Dilley et al., 2005). Of particular concern are its 'mega deltas' and concentrations of population in the Mekong and Red River Deltas. The Fourth Assessment of the Intergovernmental Panel on Climate Change characterized Viet Nam as a "hotspot of key future climate impacts and vulnerabilities in Asia" (Cruz et al., 2007). Roughly 40 million or more Vietnamese live in and around the deltas and along the coast. More recently, a firm specializing in risk intelligence services ranked Viet Nam as an "extreme risk" country, ranking it 13th of 170 countries in terms of its vulnerability to the impacts of climate change over the next 30 years (Maplecroft, 2010).

Long-term predictions for the country suggest that impacts are likely to derive primarily from rising sea levels and changes in rainfall and temperatures. A 2007 World Bank study (Dasgupta et al.) concluded that a 1-meter rise in sea level would directly result in a loss of more than 5 per cent of the country's land area, more than 7 per cent of its agricultural land and 28 per cent of its wetlands. This would in turn cause an estimated loss of more than 10 per cent of GDP and would affect about 11 per cent of the population and urban areas.

FIGURE 1

National index of climate change vulnerability



Source: Maplecroft, 2011

Climate-related risk. The impacts of past weather-related disasters suggest the longer-term climate risk Viet Nam faces. Irrespective of climate change, people in Viet Nam have long been subject to natural disasters. From 1953 to 2010, nearly 25,000 people died in natural disasters and another 77 million were affected. Total damages have been estimated at over US$7 billion. Typhoons (tropical cyclones) have been the main hazard. More than 80 typhoons hit Viet Nam between 1953 and 2010 and were responsible for 75 per cent of the deaths related to natural disasters and 60 per cent of the effects on people. Coastal areas, particularly in the north, have been the most affected. Floods have been the second most important natural disaster in terms of loss of life, property and livelihoods.

Over the past five decades, an estimated 5,000 people have been killed in floods (25 per cent of all those killed in natural disasters) and 25 million (33 per cent) have been affected (McElwee, 2010). Scenarios for future impacts of climate change suggest that these losses will greatly worsen over the course of the twenty-first century.

While it is important to note that extreme weather events are not themselves 'climate change', analyses (ISPONRE, 2009 and MONRE, 2010) indicate shifts in climatic variables over the last century (table 1). Of particular note are the findings of increases in average annual temperatures; variability of both rainfall and temperature between years and within seasons; the typhoon season tending to end later; and possibly, an increased occurrence of higher intensity storms.

TABLE 1

Current, observed climate trends

Climate zone	Temperature	Rainfall	Sea level	Extreme events
Countrywide	1911-2000: Increase in intra-seasonal and inter-annual variability		• 1993-2008: Mean rise of 3 mm/yr • 1956-2007: Total rise of about 20 cm[1]	Typhoons: Typhoons of higher intensity have been occurring more frequently and the season has been ending later
	1958-2007: Increase of 0.5°-0.7°C in annual averages	• 1911-2000: No clear trends in annual averages • 1958-2007: 2% decrease in annual average		

Climate zone	Temperature	Rainfall	Extreme events
North West North East Red River Delta and Quang Ninh[2] North Central Coast	Winter temperatures increased at faster rates than the country average	1958-2007: Annual rainfall decreased in northern zones.	Cold fronts: There was a significant decrease in occurrence over last 20 years, but anomalous events occurred more frequently (e.g. damaging cold for 38 days in January/February 2008) Cold fronts do not impact North Central Coast Zones
South Central Coast South (SE & Mekong River Delta) Central Highlands	Summer temperatures increased at slower rates than the country average	1958-2007: Annual rainfall increased in southern zones.	Typhoons: Some storm tracks showed abnormal movements southwards Typhoon's abnormal movements southwards are not an issue to central highland zones

Source: ISPONRE, 2009; MONRE, 2010.

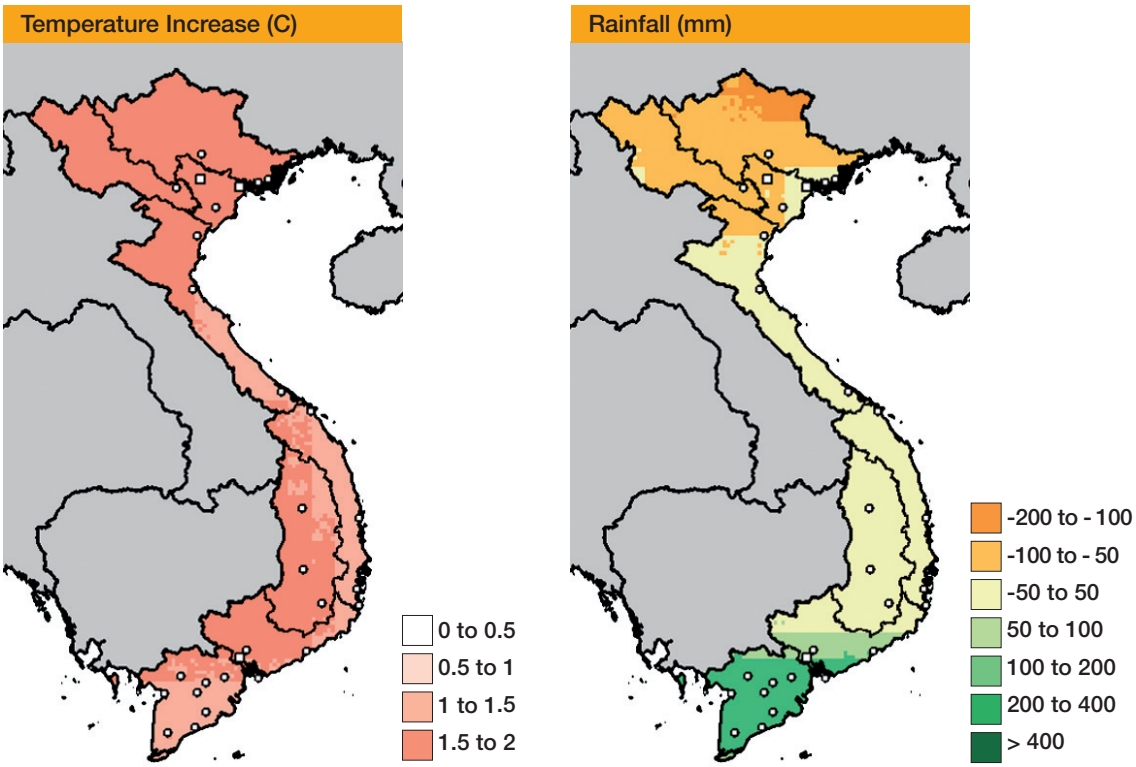
1 Red River Delta region.

2 Coastal province in North East region.

Potential impacts of climate change. Given that Viet Nam is inherently vulnerable to climate-related risk, climate change will pose a serious challenge to the country over the long term. The potential magnitude of these changes was estimated for the country's Second National Communication to the United Nations Framework Convention on Climate Change (MONRE, 2010) based on a medium emissions scenario[3] comprehended within two major SRES emissions scenarios: A1 and B2.[4] Predicted changes from the present to 2050 do not vary significantly between the different scenarios (i.e. low vs. medium vs. high emissions); later in the century (the 2070 and 2100 predictions) divergence between the scenarios has greater practical significance. For purposes of the current strategy, the short- to medium-term scenarios have relevance for planning over the next five years within a context of impacts expected to occur by 2050. Figures 2a and 2b and table 2 show the predicted changes in this climate change scenario.

FIGURE 2a

Predicted changes in temperature and rainfall – 2050



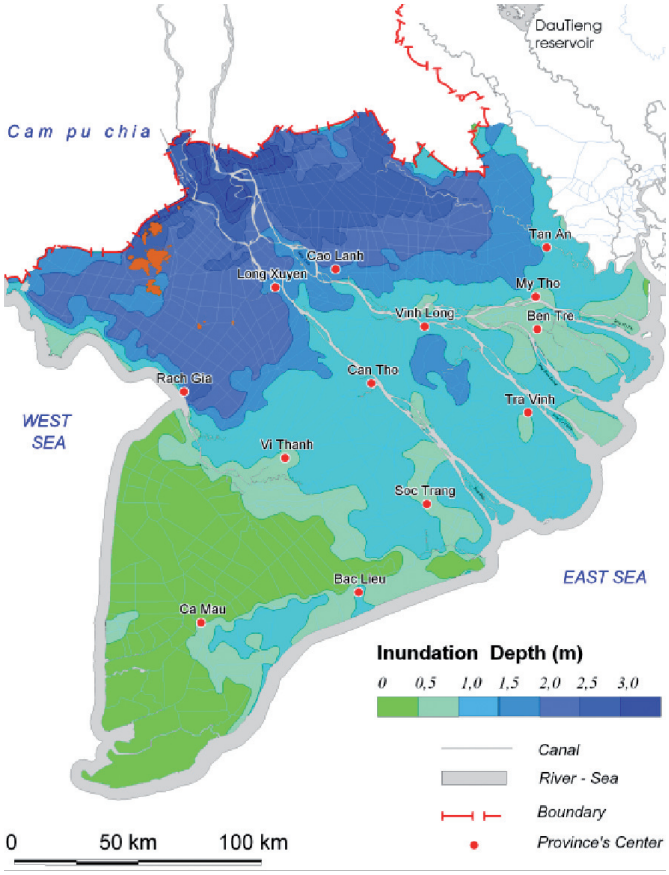
Source: IFPRI, 2011

3 An emission scenario describes the future releases into the atmosphere of greenhouse gases, aerosols and other pollutants and, along with information on land use and land cover provide inputs to climate models

4 A1 storyline and scenario family describes a future world of very rapid economic growth, global population that peaks in mid-century and declines thereafter, and the rapid introduction of new and more efficient technologies; whereas B2 storyline and scenario family describes a world in which the emphasis is on local solutions to economic, social and environmental sustainability. While the scenario is also oriented towards environmental protection and social equity, it focuses on local and regional levels. (Source: www.wmo.int/pages/themes/climate/emission_scenarios.php)

FIGURE 2b

Mekong Delta, 2050 – inundation with 0.3 m sea level rise over current condition



Source: IFPRI, 2011

More important than the estimates of the potential changes are the predictions regarding the impacts resulting from those changes, as indicated in the following summary of predicted impacts from the Government's Second National Communication to the United Nations Framework Convention on Climate Change (MONRE, 2010) and other sources (see box 1):[5]

- *Water resources.* Annual flows of rivers in the north and northern areas of the North Central Coast are expected to increase. In contrast, annual flows of rivers in the southern area of North Central Coast to the northern area of South Central Coast are expected to decrease. Flood peaks in most rivers will increase while dry season low flows will decline. Potential evapotranspiration will show rapid increases in the South Central Coast, with the greatest increases in the Mekong Delta regions. After 2020, groundwater levels are expected to drop drastically. Increases in the incidence of severe drought, especially during the dry season, and in inter- and intra-seasonal rainfall patterns will create much greater uncertainty as to moisture availability, inter-annually for crop and livestock production and intra-annually for overall availability of water resources. Increases in the incidence of extreme rainfall events will exacerbate the impacts of flooding (inundation and flash floods) and will concentrate rainfall within shorter time periods, leading to decreased soil moisture and groundwater recharge, particularly in uplands and sloping areas.
- *Coastal zones.* With rising sea levels, areas impacted by flooding will expand. The Mekong River Delta, which would be most affected, could see as much as 90 per cent of its total area subjected to flooding. Sea level rise will also lead to greater risk of saltwater intrusion in rivers and groundwater, resulting in very serious social and economic costs and displacement of populations and economic infrastructure and activities. Climate change may also seriously impact coastal ecosystems, biological reserves and forests, especially mangrove forests. By 2100, almost 5,500 km^2 of arable lands may be lost, equivalent to about 9 per cent of all arable lands. Around 168 km^2 of aquaculture area and 320 km^2 of forest land would be submerged. Loss of mangrove would be almost complete, unless accommodations are made in coastal zone planning for mangrove forests to migrate and/or be established further inland.
- *Agriculture.* Total annual temperature is projected to increase between 8 per cent and 11 per cent by 2100. In most regions,

5 Other sources: Bingxin Yu et al., 2010; IFAD, 2011b; ISPONRE, 2009; Fortier, 2010; P. McElwee, 2010; MONRE, 2008 and 2010; World Bank, 2008, 2010b and 2011c.

the number of days when temperatures exceed 25 °C will increase notably while the number of days when temperatures drop below 20 °C will decrease significantly. Water demand for agriculture may increase twofold or threefold compared with demand in 2000. Tropical plants will tend to shift further north and towards higher altitudes. Shifts in eco-agricultural zones could cause loss of varieties of indigenous breeds or species, although they may also extend the ranges of some crops.

Moisture stress in crops will be exacerbated and areas of crops requiring wet or moist conditions will decrease. Evapotranspiration rates will increase, increasing crop water usage and the damaging effects of drought. Total output from spring rice crops is expected to decline more than that of summer crops, and significant production losses are expected in all of the major grain crops (table 4a). Winter maize productivity may increase in the Red River Delta but decrease in Central Coast and the Mekong River Delta. Yield changes will vary widely across crops and agroecological zones under climate change, and estimates of these will also vary depending on assumptions about the impact of increased atmospheric CO_2 concentrations and rainfall.

The predicted 33 cm rise in sea level by 2050 would increase the area inundated by flooding to a depth greater than 0.5 m by an estimated 276,000 ha, and the area affected by saline intrusion (threshold value equals salinity of greater than 4 g/l) would increase by 420,000 ha. An estimated 13 per cent of the nation's rice production area – 590,000 ha – may be lost by 2050. Further yield impacts would result from early crop maturation and/or increased pest and disease pressures. The suitability of different post-harvest and crop storage practices may also be affected, increasing post-harvest losses.

Overall, in the absence of adaptation measures, yields will likely be reduced for rice, maize, cassava, sugarcane, coffee and vegetables. Hydrological changes and sea level rise will affect the availability of fresh water or even physically change the agricultural landscape. Climate change may also threaten the growth and reproduction of livestock and increase the incidence and spread of diseases.

TABLE 2

Climate change scenarios by climate zone (baseline: 1980-1999)

Climate zone	Change in temperature (°C) and rainfall (%)	Scenario
Coastal Viet Nam –	Sea level rise:	2020: 11-12 cm | 2050: 28-33 cm | 2100: 65-100 cm
North West	• 2020: 0.5 °C • 2050: 1.2-1.3 °C • 2100: 1.7-3.3 °C ---------- • 2020: 1.4-1.7% • 2050: 3.6-3.8% • 2100: 4.8-9.3%	• Cold fronts: Decrease in frequency, affecting NW more; increase in variability of occurrence; mid-winter peaks diminish • Temperatures: Increase in hot spell occurrences in mid and lower elevations; hot season at lower elevation longer and cold season shorter; increase in evaporation and decrease in relative humidity • Rainfall: Strong increase in variability in dry season; increased incidence of severe drought, especially in final months of dry season; increase in incidence of extreme rainfall events (intensity, scale, duration and rainy periods); in NE mountains 'drizzly' rainfall decreases between dry and wet seasons; increase in variability in onset/end of dry and rainy seasons; rainfall more concentrated in peak months
North East		

Climate zone	Change in temperature (°C) and rainfall (%)	Scenario
Red River Delta and Quang Ninh (Coastal Province NE Region)	• 2020: 0.5 °C • 2050: 1.2-1.3 °C • 2100: 1.6-3.1 °C --- • 2020: 1.6% • 2050: 3.9-4.1% • 2100: 5.2-10.1%	• Tropical cyclones: Possible increase in frequency and intensity; increase in inter- and intra-annual variability; typhoon season starts earlier/ends later • Cold front: Decrease in frequency and intensity; increase in inter- and intra-annual variability • Temperature: Increase in normal and maximums; increase in hot spell occurrence, intensity and duration; warmer and shorter cold season; longer and more severe warm season; increase in evaporation • Rainfall: Long-term increase in rainy season and increase in variability in dry season; increase in variability in rainfall and onset/end of dry and rainy seasons; increase in incidence of extreme rainfall events – intensity, scale, duration and rainy periods; increase in incidence of drought; decrease in 'drizzly' rain with increase in end-winter/beginning-spring drought • Sea level: Increase in rate of rise (5-6 mm/year)
North Central Coast	• 2020: 0.5-0.6 °C • 2050: 1.4-1.5 °C • 2100: 1.9-3.6 °C --- • 2020: 1.5-1.8% • 2050: 3.8-4.0% • 2100: 5.0-9.7%	• Tropical cyclones: Possible increase in frequency and intensity; increase in inter- and intra-annual variability; typhoon season starts earlier/ends later/becomes shorter • Cold front: Decrease in incidence; season shorter; longer intervals between fronts • Temperature: Increase in normal; windy season (dry, hot westerly winds) arrives earlier/ends later; increase in number and duration of hot spells; shorter cold season in North and southern boundary of cold season moves to higher latitudes; hoarfrost in north (rare now), ceases occurrence; increase in evaporation • Rainfall: Long-term significant increase in rainy season; increase in concentration of rainfall in current higher rainfall months; dry season little change in South, but in North May and June may be permanently dry and hot as in South; in North decrease in 'drizzly' rain; increase in daily/monthly/annual maximums in Central Coastal strip; increase in incidence and severity of drought • Sea level: Increase in rate of rise (5-6 mm/year)
South Central Coast	• 2020: 0.3 °C • 2050: 0.9-1.0 °C • 2100: 1.2-2.4 °C --- • 2020: 0.7% • 2050: 1.6-1.7% • 2100: 2.2-4.1%	
Central Highlands	• 2020: 0.4 °C • 2050: 0.8 °C • 2100: 1.1-2.1 °C --- • 2020: 0.3% • 2050: 0.7% • 2100: 1.0-1.8%	• Cold fronts: Decrease in incidence (already increasingly rare) • Tropical cyclones: Possible penetration deeper inland • Temperature: Increase in normal and maximum, especially in lower elevations and mid/lower reaches of major rivers; increase in hot spells in lower elevations, hollows and river valleys; increase in hot season duration in mid/lower elevations and decrease in cold season in mid/high elevations; increase in evaporation, contributing to severe drought in early months of year • Rainfall: Long-term increase in rainy season and strong increase in variability in duration of dry season; overall increase in variability with increase in maximum daily/monthly/annual rainfalls; increase in incidence and severity of droughts in latter half of winter; increase in variability in onset/end of rainy and dry seasons

Climate zone	Change in temperature (°C) and rainfall (%)	Scenario
South (Southeast and Mekong River Delta)	• 2020: 0.4 °C • 2050: 1.0 °C • 2100: 1.4-2.6 °C ---------- • 2020: 0.3% • 2050: 0.7-0.8% • 2100: 1.0-1.9%	• Tropical cyclones: Possibly unchanged but increasingly tracking south during September-November period • Temperature: Increase in normal and maximum; increase in incidence and severity of hot spells in early months of year; increase in evaporation with increase in dryness, especially in April and May • Rainfall: Long-term increase in rainfall in rainy season; increase in variability in dry season; distribution across southern areas changes significantly; increase in inter-annual and intra-seasonal variability in rainy season; increase in rainfall intensity and maximum daily/weekly/monthly amounts (to level equal/nearly equal to South Central) • Sea level: Increase in rate of rise (5-6 mm/year)

Source: ISPONRE, 2009; MONRE, 2010

- *Forestry.* Impacts on forest ecosystems and flora will be diverse. By 2100, native forest cover comprised of closed evergreen forests and closed tropical moist semi-deciduous forests, among others, will significantly decrease. The latter forest type is likely to be the most affected by climate change. *Chukrasia tabularis* (Burmese almondwood) and *Pinus merkusii* (Sumatran pine) forests are projected to decrease by 70 per cent and 58 per cent, respectively. In coastal zones, mangrove, indigo and Melaleuca forests may be severely threatened by sea level rise. Increasing temperature in combination with abundant solar radiation could accelerate photosynthesis processes, facilitating increased carbon uptake. However, due to an increase in evapotranspiration, soil moisture would be reduced, and consequently the biomass growth index of forest trees could decline. Risk of forest fires in all regions will be greatly heightened, primarily during the dry-hot season.

  Warmer conditions will facilitate the spread of forest pests, hampering the growth of forest ecosystems. A forestry growth model suggests that climate change will increase the variability of plantation yields across the country without having a major impact on the average yield, potentially increasing management costs to ensure appropriate species/site matching and silvicultural practices.
- *Aquaculture.* Climate change will adversely impact coral reefs and maritime and estuarine sea grass beds, and salinization in coastal zones will cause the loss or retreat of mangrove forests. The accompanying loss of habitat will reduce stocks of fish, mollusks and crustaceans. The intrusion of saltwater into freshwater estuaries and coastal lagoons will cause the replacement of freshwater species by their brackish and saline water counterparts. Impacts on the aquaculture subsector could include damage and loss of ponds in exposed coastal areas due to increased coastal erosion and rising sea level, loss of suitable land area for aquaculture caused by coastal inundation and rising feed costs if climate change adversely affects coastal marine fisheries. Rising water temperatures may have adverse impacts on overall health of fisheries (both wild and farmed) arising from increased incidence of diseases and parasitic infections. Changes in the availability of fresh water for aquaculture would not only impact fisheries' health but could lead to more competition/conflict between agriculture, aquaculture and other sectors over access to high-quality water. The main impacts on

aquaculture would accrue from increased flooding and salinity. Freshwater catfish farming in particular could face an uncertain future as a result of rising prices for feedstuffs and the costs of maintaining water quality as salinization increases. Some fish species, such as catfish, may grow more rapidly with higher temperatures but be more vulnerable to disease. Aquaculture is currently estimated to employ some 2.8 million people in Viet Nam and have an export value (2010) of about US$2.8 billion. Catfish farming accounts for more than 50 per cent of total aquaculture revenues.

- *Transportation.* Industrial facilities, equipment, power stations and transmission lines in coastal zones will face submergence and increased risk of flooding. A 1-metre rise of sea level could submerge 11,000 km of road infrastructure.
- *Human health.* Direct health impacts would occur as a result of increased incidence of heat waves and natural disasters. Indirectly, rising sea level and temperature affecting agricultural land may impact food security and increase the risk of food shortages. Warmer conditions will facilitate the spread of infectious diseases and epidemics.

BOX 1

How conservative are predictions of climate change impact in Viet Nam?

In the face of uncertainty it is often preferable to err on the side of conservatism, particularly when the potential cost of being overly optimistic would be high. For purposes of strategic planning for climate change, in 2009 the Government of Viet Nam selected a mid-range, 'medium emissions' scenario (group: A1B, B2) as the basis for modelling potential climate change impacts on the country. That scenario roughly entails average global warming of 2.3 °C and sea level rise of 75 cm before the end of this century. Is this scenario sufficiently conservative?

Modelling performed by other parties working on climate change in Viet Nam (e.g. IFPRI, Can Tho University, World Bank, others) generally complement the MONRE scenario with other IPCC scenarios. The purpose of doing so is to provide a more comprehensive view of the range of potential outcomes, given the great uncertainty in all models and scenarios. For example, given the uncertainty over climate change impacts on rainfall in Viet Nam, both IFPRI and World Bank have included the driest and wettest scenarios, in addition to MONRE's, in an attempt to better estimate the potential range of outcomes and impacts.

Also of interest is the 2011 United Nations response to Viet Nam's Second Submission to the IPCC. The response states: "The B2 scenario will lead to an average annual temperature rise in Viet Nam by 2100 of about 2.3 °C…however, recent scientific data suggests that the world is still on a high emissions pathway, and according to the A2 high emissions scenario, the average annual temperature rise would be as much as 3.6 °C in the north-central coastal region." The high emissions scenario doubles the estimated temperature increase in the north, doubles or triples the number of annual heat waves, increases the rainy season rainfall (with attendant increases in extreme rainfall events, flooding and landsliding) and predicts that average rainfall would fall by 20 per cent during dry months, especially in the southern regions.

Finally, a report by the United States Geological Survey (Doyle et al., 2010) on sea level rise in the Mekong Delta noted that subsidence has not been accounted for in the country's scenarios. Though reliable data for Viet Nam are lacking, most similar deltas around the world are subsiding at a rate greater than current sea level rise. They suggest that the rate of subsidence could be as great as 9 mm/yr or 1.5 times the predicted rate of rise.

Implications of climate change for the rural sector

Poverty and the rural sector. In Viet Nam poverty may be characterized as predominately a rural phenomenon. Over 90 per cent of the poor and almost three quarters of the population live in rural areas, making agriculture and rural development critical to Viet Nam's overall development. In 2010, agriculture (including forestry and fisheries) accounted for an estimated 20.6 per cent of GDP (CIA, 2011), 24.9 per cent of exports (World Bank, 2011a) and 62 per cent of employment (GSO, 2011). The majority of the rural population makes its living by growing and selling crops, raising and selling livestock and fish, and harvesting forest products. Rice, livestock (including poultry) and fish accounted for over 69 per cent of gross agricultural production value in the 2007-2009 period, contributing an average of 32 per cent in 2007, 22.1 per cent in 2008 and 14.9 per cent in 2009 (FAOSTAT, 2011; GSO, 2011a).

Such agricultural employment is, however, correlated with poverty. Between 1993 and 2008, a period in which poverty was significantly reduced overall, the percentage of poor households working in agriculture fell only modestly, from 51.3 per cent to 47.3 per cent (Viet Nam Academy of Social Sciences, 2011). Lacking adequate education and skills, poor households have tended to remain in purely agricultural jobs with low income, while better-off households work in non-farm sectors (VASS, 2011).

Poverty also has strong ethnic, geographic, age and gender dimensions. Poverty rates countrywide are most severe in the Northern and the Central Highlands regions, where 75 per cent of Viet Nam's minority populations live, most of them in rural areas (World Bank, 2009). In these regions, the poverty rate among the dominant minority was estimated at 45.2 per cent, and for all other ethnic minorities at about 73 per cent (Baluch et al., 2010). Poverty among ethnic minority children is especially high. Using multidimensional criteria to assess poverty,[6] the two regions with the highest rates of poverty among children were the Northwest and the Mekong River Delta. In the Mekong River Delta, the rate of multidimensional poverty (52.8 per cent) was the highest in the country (GSO, 2009). The incidence of poverty is highest in the Northern and Central Highlands regions, whereas in absolute numbers the poor are concentrated in the Red River and Mekong Deltas (VASS, 2011).

From a gender perspective, a number of challenges remain in Viet Nam that leave women more vulnerable to the impacts of poverty. Ethnic minority women and girls lag behind ethnic minority men and Kinh and Chinese women in accessing health and education services and economic opportunities. Also, women's role in the agricultural sector – where they now outnumber men – is neither fully recognized nor supported through rural development policy and programmes. Finally, progress in increasing the number of women in decision-making has been slow and inconsistent (World Bank, 2006; GSO, 2011).

Climate-related risk and poverty. Of particular concern is the nexus between climate risk and poverty. In a World Bank study on the social dimension of adaptation to climate, village-level interviews found that community members considered factors directly related to climate to be among the main causes of poverty. "Drought and hazard

6 In addition to economic criteria, criteria related to child development needs: access to education, health, housing, clean water and sanitation, as well as to social protection including protection from exploitive child labour.

damage were brought up again and again as a main cause of poverty," the authors reported (McElwee, 2010). In another case study (Lâm Thái Dương, 2009), a review of the natural disaster history in a poor community in Ha Giang found that in the 10 years between 1998 and 2008 there had been 10 major events causing losses, from floods, landslides, cold spells and typhoon-associated storms. Vulnerability to climate change is also socially differentiated. Impacts of extreme weather events are related not only to poverty status but also to access to resources and social security systems. Groups that are already the most socially vulnerable (women, ethnic minorities and disabled people) are likely to be disproportionally less able to adapt to climate change.

One impact of particular importance is increased susceptibility to health problems, such as illnesses resulting from lack of safe drinking water, vector-borne infectious diseases linked to water and temperature, and nutritional impacts resulting from impacts on agricultural output. Rural poor people in general and socially vulnerable groups in particular are also exposed to greater risk due to their direct reliance on agriculture and natural resources for their livelihoods, as well as their greater exposure to natural disasters and their lack of assets and capital to recover or to shift to alternative livelihoods (MONRE, 2010).

BOX 2

Rice, vulnerability and climate change

"The scholar precedes the peasant, but when the rice runs out, it's the peasant who precedes the scholar."

– Vietnamese proverb

The cultural and economic importance of rice in Viet Nam cannot be overstated. It is the cradle of rice cultivation, and farming began in the country thousands of years ago. Today, rice remains the most important food in terms of diet, production, cropping area and the agricultural economy. Viet Nam has a rice-based agricultural economy.

Rice is cultivated on 82 per cent of the arable land and provides 80 per cent of the carbohydrate intake and 40 per cent of the protein intake of the average Vietnamese person. About 52 per cent of the country's rice is produced in the Mekong River Delta and another 18 per cent in the Red River Delta.

Worst-case climate change scenarios predict declines in rice yields (without adaptation) ranging from 12 per cent in the Mekong River Delta to 24 per cent in the Red River Delta. Paddy rice production may fall by 5.8 to 9.1 million tons per year. The primary factors influencing rice yields are increase in average temperatures, saline intrusion and seasonal reductions in runoff.

Rice is highly susceptible to heat stress. Higher night-time temperatures, in particular, have reduced rice yields by as much as 10 per cent for every 1 °C increase in average temperature. For Viet Nam this is equivalent to 0.6 tons/ha per 1 °C increase. Many of the rice cultivars in use in Viet Nam are close to their heat thresholds, so a 1 °C increase in temperature could lead to even greater and more widespread losses unless more heat-tolerant varieties are introduced. However, even that solution might not be sufficient. According to the International Rice Research Institute (IRRI), temperatures above 35 °C for one hour while rice is flowering will sterilize rice pollen.

Other factors of concern are the extensive inundation of cropland in the rainy season and increased saline intrusion in the dry season as a consequence of the combination of sea level rise and higher river flooding. For the Mekong River Delta, it is estimated that about 0.59 million ha (or 13 per cent) of rice area could be lost due to inundation and saline intrusion.

Autonomous adaptation by farmers is already taking place. Surveys show that rice farming households are relying upon various coping strategies, including:

- Change of sowing date for winter-spring rice in the Red River Delta
- Switching to drought-tolerant crops in the Central Coast region
- Reinvigorating local varieties in the Red River Delta
- Introducing hybrid salinity-tolerant varieties of rice in coastal provinces
- Shifting the water inlets upstream to avoid saline intrusion, and finding new water sources
- Introducing a rice-fish rotation.

Sources: Laborte et al., 2012; MoNRE, 2010; Peng et al., 2004; Piper, 1994; World Bank, 2010b

Recent work by IFAD and others[7] strongly suggests that current climate-related risks are already having significant impacts on agricultural livelihoods among some vulnerable groups. Evidence of this was found, inter alia, in adaptive behaviours among communities in response to what they view as the rising incidence of natural disasters and increasing levels of uncertainty and risk associated with growing variability, both inter-seasonal and inter-annual, in temperature and rainfall. Examples encountered included a shift from annual crops to livestock production due to drought in the mountains of northern Viet Nam and the Central Highlands, and high percentages of farmers changing cropping patterns, calendars, varieties and cultural practices due to drought and reduced water availability.

Potential economic costs. Because Viet Nam's industrial and service sectors are dynamic and show good prospects for economic growth, climate change impacts on them are expected to be limited in the long run. However, this will not be true for the rural economy and those who continue to depend on farming and other rural occupations for their employment and incomes. Climate change will hit poor households in general, because of the decline in agricultural incomes and increase in food prices relative to the general cost of living. The poorest 20 per cent of households, in terms of household expenditure per person, will experience larger reductions in real standards of living due to climate change than those in the top 20 per cent of households. The effects will also be quite uneven across regions: households living in the Central Highlands region will be the hardest hit because of a decline in agricultural value-added of up to 30 per cent (World Bank, 2010b).

World Bank (2010b) estimates of the macroeconomic effects of climate change on the rural sector in 2050, without adaptation, represent a loss in overall GDP of 0.7 per cent to 2.4 per cent. Loss of agricultural value-added would be between 5.8 per cent and 13.9 per cent. The macroeconomic effects would not be evenly distributed geographically or among the population. Regionally, northern Viet Nam was estimated to lose 2.6 per cent to 6.6 per cent of GDP, whereas the south would experience growth of 0.8 per cent to 1.1 per cent. Among rural households, consumption by the poorest quintile would decrease by 2.6 per cent to 6.5 per cent, compared to an estimated decrease of 0.4 per cent to 1.7 per cent among the richest quintile. For the period from 2010-2050, the estimated costs for adaptation of agricultural cropping systems alone would be over US$6.4 billion.

Additional insight into potential costs can be found by looking at current economic impacts of natural disasters and hazards. The majority of the population lives in low-lying river basins and coastal areas, such that more than 70 per cent of Vietnamese are estimated to be exposed to risks from multiple natural hazards. Between 1989 and 2004 property losses from natural disasters averaged US$120 million per year. In the four-year period from 2005 to 2008, annual average losses were six times higher.[8] In terms of human exposure, floods are responsible for almost 60 per cent of impacts on the population, followed by storms and drought. In economic terms, storms are responsible for about 55 per cent of losses, followed by flood and droughts (GFDRR, 2011). In the uplands – home to a large percentage of the ethnic minorities who are greatly reliant on rainfed, hillslope agriculture – detailed information on natural disaster impacts is not readily available. However, flash floods, drought and landslides tend to be major concerns.

7 IFAD, 2011a; Le Duc Ngoan, 2011; Le Ngoc Thach et al., 2010; MARD, 2010; P. McElwee, 2010.
8 Calculated by author from data provided in MONRE, 2010.

TABLE 3

Estimated annual cost of climate change adaptation, 2010-2050 (2005 prices, without discounting)

Sector	Cost, US$ (million)	Adaptation responses
Agriculture	$160.0	• Autonomous adaptation: change in sowing dates, switch to drought-tolerant crops, adoption of salinity-tolerant rice varieties, adoption of new crop varieties and switch to rice-fish rotations. • Planned adaptations: (a) increase spending on research, development and extension to raise average yields by 13.5%, and (b) increase irrigated land ~688,000 ha (~50% for rice; remainder mostly maize and coffee).
Aquaculture	$130.0	Likely to be autonomous as it is capital intensive and growing rapidly: better feed conversion; improvements in marketing and upgrading of dykes (to reduce flooding and salinity); and more water pumping by semi-intensive and intensive shrimp producers to maintain water and salinity levels. Costs of adaptation are likely to be borne by operators.
Forestry	Modest	Key measures: (a) changes in land use planning to facilitate the migration of mangroves inland; (b) adoption of plantation species and silvicultural practices for drought resilience; (c) improved pest management, including genetic selection and integrated pest management; and (d) herbicides/biological control of exotic weeds. Financial costs likely to be modest, but institutional issues may not be.
Flood and coastal protection	$540.0	Build and upgrade sea dykes and flood defenses to protect urban infrastructure and the most valuable agricultural land.

Source: World Bank, 2010b

Viet Nam's climate change strategy - planned and actual

For the ARD sector, the principal orienting frameworks for medium-term responses to climate change are the National Target Programme to Respond to Climate Change and the Action Plan Framework for Adaptation to Climate Change in the Agriculture and Rural Development Sector Period 2008-2020. Both of these were approved and issued in 2008, the former by the Office of the Prime Minster and the latter by MARD. Subsequently, in 2011, MARD issued its Action Plan to Respond to Climate Change of the Agriculture and Rural Development in Period 2011-2015 and Vision to 2050 (RCC-ARD). In addition, other programmes in the sector provide relevant and important instruments for climate change adaptation and response. As such, they should ideally be aligned with the National Target Programme and the Action Plan Framework.

National Target Programme to Respond to Climate Change. The NTP-RCC is the umbrella programme and guiding framework for the Government's efforts in adaptation and mitigation of climate change risk. MONRE developed the programme and is responsible for its implementation. The current programme, covering the period from 2009 to 2015, has the global objectives of: (i) assessing potential impacts of climate change; (ii) ensuring that each sector develops a climate change response action plan; (iii) initiating efforts to move the country towards a low-carbon economy; and (iv) contributing to global efforts to mitigate greenhouse gases (GHGs). To achieve these objectives it establishes an ambitious agenda of nine tasks grouped into two operational areas:

- **Development and implementation of the nation's strategic and operational responses to climate change risk:** (i) Assess the potential magnitude of climate change and its impacts on the country; (ii) identify the appropriate adaptation and mitigation measures required; (iii) develop action plans for each sector's, ministry's and locality's climate change response programme; (iv) mainstream climate change issues into socioeconomic, sectoral and local development strategies, plans and planning processes; and (v) develop and implement those projects required for execution of the NTP-RCC.

- **Creation and strengthening of the institutional capacity required for climate change response:** (i) Develop a science and technology programme on climate change; (ii) raise awareness and develop the needed human resources; (iii) strengthen the capacities of organizations and institutions; (iv) develop appropriate policies on climate change response; and (v) enhance international cooperation as a function of implementing the NTP and sector action plans.

The total cost for implementation of the NTP-RCC from 2009 to 2015 is estimated at 1,965 billion VND.[9] This excludes funding for implementation of the various sectoral, ministerial and local action plans, the cost of which remains to be determined. Domestic sources would account for half of total funding: central budget, 30 per cent; local budget, 10 per cent; and other private sector and capital contribution, 10 per cent.

9 Approximately US$10 million at the time of approval (2008).

The other half of the resources are to come from external sources (official development assistance, foreign direct investment, etc.). To ensure the required resources, the Government has committed to its portion of the financing and to mobilizing the remaining amounts from domestic and international sources. This includes offering tax incentives for private investment and combining/integrating climate change response into other programmes and projects to leverage additional investments.

For the NTP-RCC about 72 per cent of resources will go to environmental research and governance, as well as training and education activities; 20 per cent to specific sectors, including agriculture, social affairs and industry; and 8 per cent for People's Committees at provincial and municipal levels.

Institutional arrangements for implementation of the NTP have been designed to promote integration and mainstreaming into other sectoral plans, programmes and projects. The structures are:

- A National Steering Committee comprising the Prime Minister and the Ministers of MONRE, Ministry of Planning and Investment (MPI), Ministry of Finance (MOF), MARD and Ministry of Foreign Affairs;
- An Executive Board, established under the Steering Committee and tasked with ensuring intersectoral coordination aspects, comprising the following Ministries: MONRE; MPI; MOF; MARD; Foreign Affairs; Industry and Trade (MOIT); Labour, Invalids and Social Affairs (MOLISA); Transport; Construction; Information and Communication; Education and Training; Home Affairs; Health; Science and Technology; Culture, Sport and Tourism; Defense; and Public Security;
- A Standing Office on Climate Change in MONRE that functions as the technical secretariat to the Executive Board.

A Standing Office on Climate Change has also been created in MARD and similar offices or functions are established in other ministries.

Support Programme to Respond to Climate Change. To coordinate the policy dialogue within the Government and with the official development assistance (ODA) community a Support Programme to Respond to Climate Change (SP-RCC) has been established and is managed within MONRE. It serves as a platform for harmonizing and coordinating technical and financial assistance for development of climate change-related policies for implementation of the NTP-RCC. Funded by donors including Canada, France and Japan and the World Bank (through a technical assistance loan), it has been active since 2009. Through the SP-RCC, MONRE has developed a policy matrix and related monitoring indicators to guide development of the policy measures required for implementation of the NTP-RCC. The matrix also serves as an instrument for orienting and coordinating support from the donor community in climate change policy. It includes around 55 separate policy outcomes and targets to be achieved in the 2009-2015 period. The sectors and thematic areas covered are energy, transportation, construction, forestry, agriculture, waste management, clean development mechanism, water, integrated coastal management and disaster risk management.

MARD Climate Change Action Plan. In April 2011 the Minister of MARD signed into effect the RCC-ARD, which establishes MARD's priorities for the period 2011-2015. The Action Plan's overall objective is to improve the climate change response capacity of the agriculture and rural development sector to (i) minimize climate change-related damage; (ii) reduce the agricultural sector's greenhouse gas (GHG) emissions; (iii) protect the lives of people exposed to natural disasters related to climate and sea level rise; and (iv) create opportunities for sustainable agriculture and rural development within the context of climate change. Priority thematic areas include protection of populations and agricultural lands in the coastal zones; stabilizing agriculture, forestry and salt production; ensuring food

security (especially rice production); the safety and integrity of the dyke system and other productive infrastructure important for agricultural production; natural disaster prevention and control; and economic growth that reduces both poverty and GHG emissions.

To achieve the objectives of the Action Plan, MARD has specified seven policy, strategy, capacity-building and awareness-raising tasks to be accomplished:

1) Evaluation of climate change and sea level rise impacts on agriculture, forestry, water resources, aquaculture, salt production and rural infrastructure; and development of mitigation and adaptation measure and solutions, along with response action plans for each region;
2) Development of specific programmes/projects for agriculture, livestock, forestry, aquaculture, water resources, rural development and salt production based on specific adaptation and mitigation requirements by region, and creation of new opportunities for sector development resulting from climate change impacts;
3) Awareness raising, directed at ensuring that sector staff and officials and rural communities are fully informed regarding climate change risks and potential impacts as well as the options for adaptation and mitigation of risks and impacts;
4) Training and development of human resources of the sector, fields and localities to respond to climate change challenges and create development opportunities;
5) Integration of climate change and sea level rise concerns into action plans, policies, strategies, planning and sector/field/local development plans;
6) Cooperation with other governments and donors to mobilize resources, knowledge and experience for implementation of the Action Plan;
7) Monitoring, inspection and evaluation of progress in achieving objectives and successfully implementing the Action Plan's priority tasks.

In addition, MARD has specified a series of priority investment projects to be carried out in response to predicted climate change impacts and current climate-related risks (natural disasters). These projects consist of (i) hydraulic works to protect areas of high population density, valuable agricultural land and aquaculture areas from salinity intrusion and flooding; (ii) rural development-related infrastructure; (iii) agriculture, primarily GHG mitigation through improved rice irrigation practices and biofuel crops and development; (iv) reduction of vulnerability to flooding, including relocation of households from high-risk areas; (v) forestry, primarily reforestation (mangroves and plantations) and fire control; and (vi) fisheries and aquaculture, including hydraulic infrastructure for aquaculture production and protection.

MARD has estimated the total cost of the Action Plan over the period as 72,402 billion VND,[10] of which 0.6 per cent is for the seven 'software' tasks listed above. The remaining 99.4 per cent of the funds will go to 'hardware' investment projects, of which 69 per cent is for hydraulic works; 8 per cent for rural development-related infrastructure; 7 per cent for agriculture; 5.5 per cent each for forestry and fisheries/aquaculture; and 4 per cent to reduce communities' vulnerability to flooding. Geographically, 86 per cent of financing is for coastal and delta regions; 8 per cent is nationwide; 2.8 per cent is for the North and North Central regions; 1.4 per cent for the Central Highlands; 1.1 per cent for agricultural research infrastructure (location unspecified) and 0.7 per cent for the Northwest region.

The sources of financing and the expected percentages from each are not detailed in the Action Plan. The primary sources, however, should substantially be the same as those for the NTP-RCC: central government and local budgets; private sector and other capital contributions; and external sources (official development assistance, foreign direct investment, etc.).

10 Approximately US$3.57 billion at time of approval (2011).

The institutional arrangements for the RCC-ARD comprise:

- A Steering Committee, to provide oversight and policy orientation and to ensure full participation of all involved agencies;
- Standing Office of the Steering Committee, for coordination, annual work planning and budgeting, orientation of implementation, monitoring and reporting;
- Ministry of Science and Technology and MONRE, which oversees the implementation of the Action Plan, coordinate with relevant non-MARD agencies for budget and funding approvals, appraise proposals and verify completion of investment activities;
- International Cooperation Department (ICD) of MARD, which coordinates MARD's institutional relations with the international cooperation community and is responsible for following up with them to leverage inputs – investment, financial assistance, technical support, capacity-building etc. – for action plan implementation. It also coordinates with the Standing Office of the Steering Committee to ensure attendance of Steering Committee members in forums, workshops and negotiations and participation in bilateral and multilateral cooperation associated with actions under MARD's administration;
- Departments of Planning and Finance, which coordinate planning and budgeting;
- MARD and the provincial department of agricultural development (DARD) agencies, which are responsible for development, approval, organization and reporting on detailed agency implementation plans, and for developing and submitting proposed annual work plans and budgets to Ministry of Science and Technology and MONRE (Climate Change Steering Committee Standing Office). They also report as required on implementation of annual work plans.

National Strategy for Natural Disaster Prevention. Viet Nam's National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020 was approved by the Government in 2007. Its main tasks are:

- Integrating disaster risk management into socio-economic development plans at the national and local levels, with a focus on disaster response;
- Ensuring sustainable disaster recovery, which integrates disaster risk management;
- Planning regional disaster risk management strategies for the five geographical regions of the country;
- Combining structural and non-structural measures in disaster risk management and dividing implementation responsibilities and timing for risk reduction among a range of ministries.

Traditionally Viet Nam has focused on preparedness and response, with a strong emphasis on structural measures such as dykes and seawalls, and the strategy largely follows the same approach, with one very important difference. The implementation plan for the strategy (CCFSC, 2009) offers an opportunity to link community-level disaster risk management/vulnerability reduction with climate change response. Of particular interest for IFAD would be actions having to do with community-based disaster risk management (CBDRM). The CBDRM action plan[11] covers:

- Capacity-building for local government staff at all levels on managing and implementing CBDRM activities, including training courses on CBDRM policy, mechanisms and implementation guidance for trainers, agencies and local staff; training of trainers; and capacity-building for local authorities;
- Capacity-building on CBDRM for communities, including formation of community-selected working groups; development of participatory hazard and vulnerability maps; development of annual plans on disaster prevention, response and

11 www.ccfsc.gov.vn/resources/users/6D696775656C/Annex%20II%20CBDRM%20action%20plan.pdf.

management, including climate change concerns; annual updating of hazard and vulnerability maps and community monitoring of implementation of activities; and small-scale works for disaster prevention, response and management.

MARD has estimated that it will need US$18 billion to implement its portion of the Strategy, including about US$13 billion for structural measures (i.e. building reservoirs, dams and dykes) and US$5 billion for non-structural measures. MARD is also responsible for developing and implementing training and capacity building programmes, while People's Committees are responsible for local planning and hazard/vulnerability mapping.

National Target Programme on New Rural Development 2010-2020. This programme, referred to as the NTP-NRD, implements ARD sector's New Agricultural and Rural Development Strategy, also known as 'Tam Nong', which is of particular importance for IFAD. Issued in 2008, Tam Nong strategy calls for structural changes that will widely affect policy, legal frameworks, planning, land use, investment and principal factors of production in the sector and in rural areas. The new strategy is focused on speeding up industrialization and modernization of the rural sector, and MARD is the lead ministry for implementation. Among others, the strategy calls for:

- Improved natural resource management and climate change adaptation for livelihood security, and building capacity at the grass-roots level to promote sustainable uses of natural resources to enhance the livelihoods of the farmers;
- Decentralization of decision-making and resources covering economic and social issues;
- The transition of the State's role in agriculture from service provider to regulator and facilitator, with public resources only being used where the private sector would not be expected to invest or provide services;
- A continued transition to market-oriented agriculture and rural economic development;
- Economic growth and competitiveness through creation of non-farm and off-farm employment opportunities through accelerated market-oriented reforms.

The NTP-NRD, approved in 2009, aims to bring under one umbrella all rural programmes and re-align them consistent with the NTP-NRD's objectives and desired outcomes. Operational details for implementation of the NTP were spelled out in a 2010 Decision issued by the Office of the Prime Minister, which detailed the programme's 11 components and their institutional and implementation arrangements. While all are important for rural development, three of the components are particularly important relative to climate-smart investment and in building resilience for adaptation to climate change:

- General master plan for rural development, which includes all planning processes for the development of 'new' rural areas, i.e. planning of land use, basic infrastructure, production of agricultural commodities, agro-industry, craft industry, provision of services, socio-economic and environmental infrastructure, new residential areas and improvements to existing residential areas in communes;
- Socio-economic infrastructure development, which consists of construction of roads, power grids, clinics, schools, irrigation systems, etc.;
- Economic restructuring, development and income improvement, which includes restructuring agricultural production towards production of commodities with 'high economic efficiency'. It also includes strengthening extension activities and increasing research outputs on advanced technologies for agroforestry and aquaculture production.

Payment for forest environmental services. In December 2010 the Office of the Prime Minister approved Government Decree 99,

which established the scheme for implementation of the Policy on Payment for Forest Environment Services (PFES). The specific criteria, content and measures for implementing the policy have yet to be worked out, but it is expected that it will be piloted by the end of 2013 and will be reviewed for subsequent full roll-out.

One objective of the policy is for PFES to "contribute to ensuring harmony and balance of the living environment: to conserve biodiversity; to prevent and limit adverse impacts of natural disasters (flood, drought, soil erosion, desertification, carbon sequestration and retention, air environment pollution; greenhouse gas emissions; climate change, etc.). "It also recognizes that the State will have to move quickly to allocate forest lands and assign or provide contracts for forest use on a "stable and permanent manner to organizations, households and village communities" in order for PFES to be of use.

The policy includes these stipulations: (i) river basin master plans will serve as the basis for identifying forest areas, liable payers and potential payees of forest environment services payment in each basin; (ii) the general census on forests, being carried out during 2010-2015, will provide the basis for implementation of the policy; (iii) hydrologic services (such as water quality, seasonal flows) will be considered, and hydropower plants, water supply utilities, industrial water users drawing from natural sources and aquaculture facilities will be subject to fees that will be used to finance monitoring of the quality of forest environment services; and (iv) other eligible services will include carbon sequestration; avoidance of deforestation; habitat services, particularly fishery spawning grounds and food and seed sources; and industrial production establishments using water directly from water sources.

Among the main target groups to receive PFES payments are the 30 per cent of the population living in mountainous regions, a high percentage of whom are ethnic minorities.

Details of payments and payment levels are still being worked out, but in the interim, a payment of 200,000 VND/ha/yr (or approximately US$9.85) has been set for PFES from hydropower and water utilities (Pham, 2009). Additional government programmes also provide payments to households and individuals for forest protection. Notionally, these can also be included as forms of PFES: (i) Project 661, 100,000 VND/ha/year based on the area of forest contracted to the households by the Forest Management Boards; (ii) Programme 135, 100,000 VND/ha/year, based on the area of forest managed by the Commune People's Committees and Forest Management Boards; (iii) Programme 304, 100,000 VND/ha/year and 15 kg of rice/individual/month for forest protection; and (iv) Programme 30A, 200,000 VND/ha/year and 15 kg of rice/individual/month for a maximum of 84 months.

Farm insurance. The Ministry of Finance has been experimenting with a farm insurance programme during the 2011-2013 period.[12] It provides poor farming households with a subsidy of up to 100 per cent of the insurance premium. Other farming households will receive 60 per cent, and agricultural production organizations will receive 50 per cent. According to the draft document, the insurance covers three main categories: cultivated crops (rice), domestic animals (buffalo, cows, pigs and poultry) and aquaculture (tra and basa fish, black tiger shrimp and white-leg shrimp).

Rice insurance will be offered in seven provinces, livestock insurance in nine provinces and fish and shrimp hatchery

12 Previous experiences with farm insurance in Viet Nam have not been widely successful. The majority of the sector are smallholders, and the high frequency of natural disasters and epidemic diseases makes insurance risky. Insurance companies must therefore require high premiums, which few farmers can afford. Farmers in their turn find it difficult to make the cost/benefit calculation that might convince them to spend scarce resources on insurance policies. Demand for agricultural insurance is reduced by Viet Nam Bank for Agriculture and Rural Development lending policies that provide for a liberal rescheduling of debt when natural disasters occur and repayment of loans is problematic. This policy acts as a form of insurance for the farmer (GlobalAgRisk, 2009).

insurance in five provinces. Only one of the provinces where IFAD works (Ha Tinh) is covered by the pilot for rice insurance, none are in the pilot for livestock and two (Ben Tre and Tra Vinh) are in the pilot for fishery and aquaculture. Minimum conditions for coverage will be established (e.g. a farmer must own at least 10 dairy cows or 50 beef cattle) that may keep insurance out of the hands of the more vulnerable smallholders (Viet Nam Business, 2011).

ODA/development partner support for climate change in ARD. Based on a review of a database compiled by the World Bank on climate change investments in Viet Nam, around US$1.37 billion has been pledged to climate change activities over the 25 years between 1992 and 2017. More than 55 per cent of these resources have been in the form of loans. Including Government of Viet Nam funds, 51 per cent of total resources committed have been designated for climate change adaptation, 46 per cent for mitigation and 3 per cent for capacity-building, awareness-raising and institutional support. The top five major financiers, accounting for almost 80 per cent of all financing, are World Bank (43 per cent), European Union (12 per cent), Government of Viet Nam (12 per cent), Asian Development Bank (ADB) (7 per cent) and Japan International Cooperation Agency (JICA) (5 per cent). Denmark and Australia are the other main bilateral financiers. GEF and UNDP have also provided major funding.

The same database projects that IFAD will be a major financier of climate change adaptation under its next COSOP. The database's assumption is that IFAD's entire portfolio (including leveraged GEF/SCCF and GEF/SPA funds[13]) under the new COSOP will be oriented to climate change concerns. Based on this assumption, IFAD would become the second-largest financier of climate change actions in Viet Nam, at 12 per cent, following the World Bank (38 per cent).

Table 4 provides an overview of recent funding for climate change. Almost 100 separate programmes, projects and activities have either just ended or are ongoing. These represent some 60 per cent of all the investments in climate change in the last quarter century. At the point when IFAD's new COSOP comes on line in 2013, only 28 of these 98 activities will be ongoing.

Current IFAD portfolio. In IFAD's prior COSOP (2008-2012) climate change was to be pursued as a cross-cutting theme. Specifically, the intention was to promote the development of climate change-resilient agricultural systems oriented towards reducing GHG emissions, reducing emissions from deforestation and forest degradation, and community-based agroforestry for carbon sequestration in the uplands. Over the course of the COSOP period, in partnership with the Global Mechanism of the United Nations Convention to Combat Desertification, there was to be an ongoing process to formulate and implement mitigation and adaptation actions. Pilot projects, studies and capacity-building activities were to provide key inputs to the national agenda and policies for climate change.

13 Global Environment Facility/Special Climate Change Fund and Global Environment Facility/Strategic Priority for Adaptation.

TABLE 4

Recent climate change funding by ODA and the Government of Viet Nam – activities ending 2010-2017

Theme or sub-theme	Number of projects/ activities	US$
Adaptation-general	5	143 878,788
Adaptation-Agriculture/forestry/fisheries	8	6 510,000
Adaptation-water/urban	4	1 941,790
Adaptation-social/economic	2	185,000
Adaptation-natural disasters	5	108 577,500
Adaptation-coastal	2	4 700,000
Adaptation-Mekong Delta	4	182 900,000
Current situation/trend in climate change	3	--
National Science and Technological Programme	1	--
Capacity strengthening-general	9	5 970,000
Capacity strengthening-agriculture/fisheries	2	--
Capacity strengthening-energy	1	--
Capacity strengthening-industry/urban	2	--
Capacity strengthening-natural disasters	2	450,000
Capacity strengthening-community level	2	6 289,450
Awareness raising	2	--
Mainstreaming	4	3 650,000
Low carbon growth planning	1	--
Mitigation-general	2	405,000
Mitigation-agriculture	4	5 348,600
REDD	12	17 032,000
Mitigation-energy/power sector	2	--
Mitigation-energy/renewables	2	240 800,000
Mitigation-energy/energy efficiency	10	66 975,000
Mitigation-industry	1	2 600,000
Mitigation-urban	1	9 800,000
Mitigation-transport	2	9 800,000
Financial mechanisms-general	3	1 500,000
	98	**819 313,128**

Source: Adapted from World Bank-provided database on climate change investments in Viet Nam

Several preliminary activities were identified during the COSOP formulation for mainstreaming adaptation to climate change interventions and mobilizing supplementary financing through the pursuit of GHG mitigation measures. A central concept was to assist in developing payment for environmental services (PES) schemes that would translate into rewards for poor communities in upland areas that acted as good stewards of their natural resource base. Key assumptions underlying this strategy were: (i) IFAD needed to play a catalytic role in promoting the Government's engagement in climate change issues; (ii) forest land use rights certificates would be awarded to individuals in an equitable and timely fashion, providing both an incentive and enabling conditions (legal, social, economic) for development of PES, especially carbon payments; and (iii) international mechanisms for carbon sequestration payments (e.g. reducing emissions from deforestation and forest degradation [REDD], Clean Development Mechanism) would become operational in a timely fashion, as would other opportunities (national and international) for PES for biodiversity conservation and provision of hydrologic services.

When the COSOP was being developed relatively few activities directed at climate change were taking place at the national level. The major ones were investments directed at natural disaster management and mitigation in urban transport. As such, it was reasonable for IFAD to propose playing a role in raising attention on climate change concerns and policy needs. It was the end of 2008 when the National Target Programme for Response to Climate Change was approved and MARD approved its Response to Climate Change Action Plan framework. Between 2008 and 2011, over 100 new activities directed at climate change were initiated and almost US$740 million was committed to those activities. Thus the COSOP assumption on IFAD's needed role became obsolete early in the COSOP, and IFAD wisely directed its efforts in national policy dialogue towards other areas (e.g. the NTP-NRD).

The other two key assumptions also turned out to be somewhat optimistic. Issuance of forest land use right certificates tended to lag in most of the IFAD project provinces as well as nationwide. Progress was made – roughly 24 per cent of Viet Nam's forest lands are managed by households – but it was uneven. Progress towards PES was also impeded by lack of readily available technologies (proven both financially and technically) for incorporating those lands into the diversified production systems of most smallholders. Finally, the international schemes have been very slow to develop, with REDD activities in Viet Nam primarily constituting preparation and feasibility activities, with few REDD project activities taking place on the ground. The Clean Development Mechanism is also slowly developing in Viet Nam.

Climate change concerns have been addressed to a greater or lesser extent in all of IFAD's projects since 2008. For the two projects that were developed under the prior COSOP (2004-2008), this required retrofitting. The Improving Market Participation of the Poor in Ha Tinh and Tra Vinh Provinces (IMPP) project, approved in 2006, has perhaps done the most interesting and practical work on climate-proofing among projects in the portfolio. Table 5 summarizes the extent to which climate change was integrated into the design and the extent to which action was taken during project implementation. For the two most recently approved projects, initiated in 2011, it is too early to assess the implementation experience.

For the next COSOP period, the current portfolio will provide valuable lessons and experiences. In particular, IFAD's experiences with developing tools for local, participatory planning and promoting their integration into the Socio-Economic Development Plan (SEDP) process are extremely useful. This is true despite the fact that much of that experience concerns value-chain planning and local development. The policy and institutional challenges of integration and institutionalization are greater challenges; technical content is much more straightforward to develop. Clearly the climate-proofing tool for value chains planning and investment, developed with GIZ (German international cooperation) in the IMPP, is also a high-value asset that will be further developed in the next period.

Regarding PES, it is difficult to predict how much more effort may be merited to capture international funds for GHG reduction. It would make sense to explore more local options for PES under the next COSOP period, particularly given Decree 99 of 2010 on the Policy for Payment for Forest Environmental Services, which stipulates that certain ecosystem services users (including hydropower, water supply and tourist companies) must pay ecosystem services providers for valuable forest ecosystem services. Overall, it will make more sense to prioritize climate change adaptation interventions, particularly if doing so presents the opportunity to leverage additional benefits from mitigation for rural poor people at a reasonably low transaction cost. IFAD supervision missions should remain alert to identifying such opportunities over the coming years.

TABLE 5

IFAD projects under implementation during 2008-2012

Project/year approved	Principal climate change-relevant content	
	At design	Current
Economic Empowerment of Ethnic Minorities in Poor Communes of Dak Nong Province, 2010	• Strategic partnership to develop innovative policies on climate change mitigation and market access with IFPRI • Interventions to be conceived in climate change context and contribution to mitigation and adaptation • Indicators: None	Project in first year of implementation
Agriculture, Farmers and Rural Areas Support Project in Gia Lai, Ninh Thuan and Tuyen Quang Provinces, 2010	• Subcomponent for development and institutionalization of market-oriented socio-economic development planning (MOP-SEDP) and implementation to mainstream 'climate proofing' into Government's planning and budgeting mechanism • Indicators: Indirect – MOP-SEDP mainstreamed at provincial level	Project in first year of implementation
Pro-Poor Partnerships for Agroforestry Development Project, 2008	• Indirect: PES to provide productive safety net for poor upland farmers • Indicators: Indirect – areas under sustainable land management and sustainable forest management; increased income thru PES; sustainable livelihoods thru non-timber forest products and ecotourism	• Partnership with World Agroforestry Center on developing PES for carbon (REDD, primarily) • Piloting pro-poor RES/PES mechanisms • Studies completed (landscape/livelihoods; carbon stock assessments for major land uses; opportunity costs for REDD+)
Developing Business with the Rural Poor Program, 2007	None	• Climate change vulnerability review of project • Incorporating: climate-proofing infrastructure; climate change into SEDP improve climate change-sensitive maize and cattle systems; research on adaptation.
Improving Market Participation of the Poor, Ha Tinh and Tra Vinh Provinces, 2006	• Indirect: NRM and sustainable livelihoods intentions • Indicators: None	Substantial: integrating climate-proofing planning tools in SEDP and value chains: vulnerability assessments, geo-spatial analysis; climate-proofing planning tool developed and tested

Communities and farmers. While there are no systematic studies of how rural poor people are coping with climate risk and climate change, the growing body of case studies and reports presents a varied picture. The evidence generally shows that where the impacts are easily recognized (e.g. changing onset of the rainy season) and the adaptation response is relatively simple and low cost and requires minimum collective action (change planting date), private adaptation is taking place and farmers are coping. Where these factors do not hold,

the situation may be more difficult and households are not able to adequately cope.

Some case studies illustrate this reality:

- Oxfam (2008): Case study of rural poor in Ben Tre and Quang Tri provinces. Households are already experiencing the consequences of climate change and in many cases are ill-equipped to reduce or adapt to the consequences. In many villages women are hit the hardest by natural disasters. They often cannot swim, have few options for alternative livelihoods when crops are destroyed and have fewer employment opportunities away from the home. In Ben Tre, the main problems were typhoons, unpredictable weather and the threat of saltwater intrusion from sea level rise and other factors. In Quang Tri, unpredictable and concentrated rainfall was causing more flooding than usual or flooding at unusual times of year. Prawn farming, which had been very lucrative, was becoming too risky due to saline intrusion, unpredictable weather and disease, etc. Farmers with fewer resources could not adapt and were left worse off due to being in debt and losing employment, etc. Positive examples were found of farmers changing crop cycles or planting different crops.
- McElwee (2010): Interviews in Ha Giang province and the Mekong Delta.
  - Ha Giang: In rocky, mountainous areas households are growing different crops to lessen damage from water stress. Nearly 30 per cent of the corn area was converted to grass plantation in 2009 due to lack of water. The villagers plant elephant grass from Guatemala as fodder for buffaloes due to its resistance to cold spells and suitability on sloping lands, where it also helps prevent soil erosion. New buffalo/cow markets have emerged. Rice and corn are still major crops but short-term (3-4 month) varieties are replacing local (6-month) varieties. Chinese rice varieties are widely used due to their resistance to drought. Corn varieties that fit the shorter rainy season are imported from Thailand. Short-maturing varieties are preferred to prevent tornado damage and because, if the crop is unsuccessful, there is still time to replant.
  - Mekong Delta: Households coped with hotter days by buying fans and with colder days by wearing more clothes. They also undertook disaster risk reduction measures like preparing houses before storms. In terms of medium-term measures, more than three quarters of households have done nothing. Residents had no ideas on how to adapt in the long term; they said they needed more knowledge. Before extreme events, collective action primarily took the form of preparedness activities. Residents exchange information heard from early warning systems and on things to do such as reinforcing houses. Preparatory activities that entailed additional funds or labour – such as maintaining rescue roads, building sandbag dykes and dredging drainage/canal systems – were less common. After climate events, collective action emphasized rescue and relief activities. Households collaborated to clean up and distribute goods and assistance to affected people and to reinforce and repair damaged dwellings and public infrastructure. Collective action was not seen in the form of a long-term adaptation strategy. Overall, collective community action emphasized labour rather than investment. It appears that most collective action involves easier actions that entail little sacrifice of time or money.
- IFPRI (2011). In the Red River Delta planting dates in the winter-spring rice planting area have been continuously shifting in response to changing seasonality. In 1994 about 28 per cent of rice was planted in early spring, 34 per cent in middle spring and 38 per cent in late spring. By 1998, this had changed to 31 per cent early, 13 per cent middle and 56 per cent late spring. In 2004, the pattern was 13 per cent early, 2 per cent middle and 85 per cent late.

Proposed IFAD responses - opportunities and priorities

Opportunities. The NTP-RCC represents only the first step in a much longer process of translating a broad vision for the country into specific priorities, strategies and action plans. It concentrates on research, planning, communication and inter-institutional and intersectoral coordination. Detailed responses are left to line ministries to specify through their own sectoral action plans. As such, the NTP-RCC is not itself a climate change strategy.

For implementation of the NTP-RCC seven priority areas were identified for the period 2009-2015. Three of these are areas for which IFAD has both the institutional mandate and comparative advantages:

- **Aid awareness enhancement and human resources training**
  - Support Women's Unions to promote awareness on gender issues and the role of women in climate change response among other social organizations, MARD/DARD and local governments.
  - Support the Youth Union to conduct awareness-raising programmes among young people on climate change and increase their involvement in response planning and actions; and promote awareness of the role of young people among other social organizations, MARD/DARD and local governments.
  - Develop plans and programmes to raise awareness of selected groups in the provincial administration system, social organizations, the media and the community.
  - Support the development and dissemination (through public media channels) of climate change information relevant to agriculture, rural development and disaster risk management.
  - Support awareness-raising actions for the general public through social organizations, MARD/DARD and local governments.
- **Develop and implement action plans to respond to climate change**
  - In coordination with MPI, work with provincial planning and investment departments to develop guidelines for mainstreaming climate change issues into the SEDP development and implementation processes at commune, district and provincial levels.
  - Support provincial efforts (by departments of planning and investment, DARD, Division of Natural Resources and Environment) to develop climate change response plans at commune, district and provincial levels.
  - Support the development of policies and mechanisms – where compatible with the objectives of poverty reduction, climate change adaptation and/or disaster risk management – that encourage investment in clean development mechanisms, emissions reduction and environmental protection, and implement pilot projects.
  - In coordination with MOLISA, support development of policy proposals and measures for poverty reduction among populations and areas most vulnerable to climate change, and ensure they address issues of migration, resettlement, gender and livelihoods, and implement pilot projects.
  - Support efforts by provincial People's Committees to assess impacts of climate change and sea level rise on their provinces and localities and develop pro-poor action plans to respond to climate change and sea level rise.
  - Support MARD/DARD to develop and implement action plans to respond to climate change, particularly in terms of mainstreaming climate change issues into pro-poor strategies, programmes and plans.

  - In coordination with MOIT and MARD, at provincial level and specific to IFAD-supported value-chains, support the development and implementation of measures to respond to climate change in trade activities, and implement pilot projects.

- **Develop and implement science and technology programmes on climate change.** Support MARD and DARD in adaptive research, policy and technology development, and pro-poor agriculture and rural development to mainstream climate change issues into environmental protection programmes, natural resources management, natural disaster prevention and marine research programmes that serve IFAD's target group of rural poor people, ethnic minorities, women and young people.

MARD's RCC-ARD is also a reasonably good framework for organizing IFAD's strategy and interventions. It is a serious effort to respond to the issues that climate change raises for the sector. The vision it provides to 2050 is comprehensive and recognizes the wide and complex range of interventions needed to support adaptation and enhance the resilience of vulnerable populations countrywide. It identifies the types of policy, institutional, investment and technical responses required to achieve the goal of "Ensuring that [all stakeholders] benefit equally from climate change mitigation and adaptation activities" (MARD, 2011). It recognizes that one size does not fit all and that flexibility and locally adapted responses are important.

On the other hand, the 2011-2015 action framework for the implementation of the longer-term RCC-ARD strategy is unclear on how the broader vision to 2050 will translate into local schemes for adaptation. It lacks guiding principles, criteria or priorities for involving the diverse stakeholders that must be engaged – the private sector, communities and authorities, social organizations and NGOs, provincial governments, etc. – for its execution and to refine and develop its next phases. The 2011-2015 action framework concentrates on a limited set of 'hard' investments in coastal areas to combat sea level rise and, to a lesser degree, on GHG emission reduction (mitigation) investments. With over 90 per cent of the funding earmarked for specific hard investments, there is little room for strengthening capacity for local action or for the types of 'soft' investments important to building capacity and resilience for the long term.

Largely absent are the important themes of adaptation for non-irrigated and/or non-rice farmers, as are investments in strengthening extension and research to support farmer adaptation. Poverty reduction and food security receive limited attention. Some of the proposed GHG mitigation investments constitute the only recognition of the need for a pro-poor climate change response. For food security, important adaptation investments are proposed for rice. Yet the issue of food security among rural poor people – particularly ethnic minorities and other vulnerable populations – is left out of the five-year action framework.

These weaknesses in the action framework provide a number of relevant opportunities for IFAD. Broad support is needed to develop pro-poor policies and approaches for climate change adaptation and mitigation, integrate the concerns of vulnerable groups and establish a bridge between field-level learning and national policy dialogue. These actions are just beginning in the near-term Action Plan and fit well with IFAD's comparative advantages. In addition, they open the potential to promote the retrofitting of existing ARD programmes by mainstreaming climate-proofing tools into SEDP planning and implementation processes.

Together, these actions could provide a coherent approach to addressing climate change when systematically applied across the IFAD portfolio of vulnerability assessment (physical, social, livelihoods); identification of requirements to climate-proof livelihoods and of opportunities for new, sustainable livelihoods; climate-risk and climate-change awareness, education and capacity-building to improve local capacity and resilience;

community-based natural resources management, integrating disaster vulnerability reduction through local land use planning and investments in vulnerable and protection zones; development of knowledge networks among farmers and researchers to identify successful adaptive behaviours and extend them to other groups and communities; support for public-private partnerships in the context of climate-smart value chains; and knowledge management, to bring field learning to policy discussions and donor coordination forums.

Comparative advantages and opportunities for innovation. IFAD can capitalize on its comparative advantages in Viet Nam to ensure that its portfolio and investments are climate smart and provide an effective platform for engagement with the Government and development partners on policy, strategies and initiatives for climate change adaptation and mitigation. One principal advantage derives from IFAD's mission to enable poor rural people to overcome poverty and its agriculture-oriented agenda of improving food security and nutrition, raising incomes and strengthening resilience. At present the international partners in Viet Nam are reducing support for rural development and poverty alleviation, due to the country's success in reducing poverty and its recently achieved middle-income status and World Trade Organization membership.

Many donors, specially bilateral donors, are shifting their policies from a development cooperation relationship to a partnership relationship. Non-refundable aid is decreasing, and the focus is shifting to technical support and trade/business promotion. In parallel is a shift in concessional financing in favour of hard loans from both bilateral donors and multilateral sources (e.g. Viet Nam is now an IDA blend country[14]) as a result of Viet Nam's middle-income and World Trade Organization status. By focusing on pro-poor adaptation and mitigation, IFAD could both compensate for the loss of donor focus on agriculture and rural poverty and support critical ARD objectives that do not receive sufficient attention in the context of current sectoral climate change policy and strategy.

Another strong comparative advantage that IFAD brings into the next COSOP period is the knowledge, experience and institutional relations and capital developed through its current portfolio. Much of what IFAD is currently supporting will remain relevant to and necessary for climate-smart investment in Viet Nam: targeting of the most vulnerable populations among rural poor people (ethnic minorities, women, children and youth); participatory local planning processes and integration into the SEDP; improvements in access to and quality of rural services (extension, credit, input supply); market access and pro-poor value chains; sustainable, natural resource-based livelihoods; capacity-building at all levels to improve the management of development processes and outcomes; strengthening of social capital through support for local groups and the mass organizations on which they depend; and strategic support to local and provincial-level agencies and authorities to adapt and implement central government rural development policies under those programmes that have been decentralized to them.

IFAD has also developed good working relationships with the authorities in the provinces where it works. Those relationships have extended to the national level, where IFAD is recognized as an important source of finance, innovation and learning among both the donor community and the concerned ministries (principally MARD, MPI and MOF). IFAD has the institutional capital and recognition required to engage at all levels and create opportunities to support, influence and strengthen government strategies and initiatives for climate change adaptation and mitigation.

14 International Development Association (IDA) blend countries are those that are eligible to receive IDA resources based on per capita income, but that also have limited creditworthiness to borrow from the International Bank for Reconstruction and Development.

Finally, in the short and medium term, the major opportunities for achieving effective and durable pro-poor responses to climate change lie in synergistically combining concerns for disaster risk management, climate-related risk and climate change threats into the SEDP process through local planning instruments and processes. Given that SEDP is the principal planning instrument for allocating public financing for the ARD sector, linking with SEDP provides the opportunity to institutionalize pro-poor, climate-smart development approaches and see them replicated across the entire country.

General priorities. IFAD should continue approaches and activities that contribute to increasing resilience and enhancing adaptation capacity by accelerating support for best practices in the areas of (i) poverty reduction/sustainable livelihoods; (ii) natural and water resources management; (iii) sustainable agriculture; (iv) securing long-term household access to land, forest and water resources; (v) improving access to credit; (vi) improving access to and effectiveness of services, especially agricultural extension and village-level animal health services; (vii) promoting access and linkages to markets and value chains; (viii) securing physical access to markets (e.g. all-weather and life-line roads); (ix) improving access to education and vocational training; (x) building capacity and strengthening local institutions for decentralized management of public ARD and poverty reduction programmes; and especially (xi), integrating local planning processes into the SEDP.

New priorities emerging from the need to ensure climate-smart investment and to capitalize on existing policies, strategies, programmes and opportunities are: (i) support local land use planning with CBDRM hazard mapping for vulnerability reduction, disaster risk management and orientation of public investments; (ii) mainstream tools for climate proofing local investments into the SEDP planning processes; (iii) target investments to climate proofing, reducing vulnerability, increasing resilience and capacity for adaptation and/or maintenance of environmental services important to water supply and natural resources-based livelihood, and to production systems; (iv) support adaptation-focused research that is relevant to rural poor people; (v) support development of knowledge management capacities and approaches required to learn from experience and feed this knowledge back into policy and planning processes; (vi) provide support at the provincial level and in MARD for developing policy-relevant information on pro-poor climate change adaptation and adaptation financing, integration through the SEDP process, development of local PES schemes and management/mitigation of climate change, including induced migration; and (vii) strengthen mechanisms for coordination of the RCC-ARD through programmatic frameworks, better stakeholder engagement strategy and knowledge sharing.

IFAD's targeting strategy. In integrating climate change concerns into its next COSOP, IFAD should substantially retain its current targeting strategy. First, sensitivity to climate-related risk and climate change impacts is a direct function of social vulnerability. In Viet Nam, rural poor people are the most sensitive and, among them, ethnic minorities, women and children are the most vulnerable. Second, poverty reduction is one way, if not the best way, to enhance household and community capacity for adaptation. To increase resilience to climate change impacts, good rural development and natural resource policies and programmes will be good adaptation policies and programmes. Thus, the factors that drive IFAD's prioritization for the 2013-2017 period will be substantially compatible with those factors that would otherwise drive priority-setting oriented to climate risk. However, in weighing its geographic priorities for investment under the next COSOP, IFAD should give extra weight and consideration to the following regions as areas where rural poor people are particularly sensitive and exposed to climate risk, and thus merit additional consideration. In order of priority, those regions are:

- Mekong River Delta: Based on poverty head count (i.e. not on poverty rate) the delta has a very large population of rural poor people and is the region likely to suffer the greatest impacts from climate change;
- Central Highlands: Because of its high rates of poverty, large ethnic minority population and the prevalence of rainfed subsistence agriculture, the Central Highlands are highly sensitive to climate change risk and natural disasters. Here adaptation and poverty reduction imperatives go hand in hand. In addition, the Central Highlands is already a destination zone for many migrants, but with future displacements of populations from the coastal areas and Mekong River Delta, undoubtedly the Central Highlands will see greatly increased in-migration in future decades;
- Northern Mountains: The northern mountains have the highest rates of poverty in the country and the largest ethnic minority populations. It is also probably the area most sensitive to the impacts of climate-related risk and natural disasters, because of those factors. IFAD already has a strong presence in the Northeast, but as yet none in the Northwest;
- Central Coast, both northern and southern: Poverty rates in the North Coast are similar to those in the Central Highlands (29 per cent), and there are areas in both North and South with pockets of ethnic minorities as well as poor rural communities dependent on fishing or rainfed agriculture. A high percentage of the population in this region is exposed to climate change and natural disaster risk. In the semi-arid south, scarce water resources and drought are severe limitations and risk factors. In many parts of the Central Coast the structure of the economy is rapidly changing to industrial and service-based. Over the long term there is limited opportunity for greatly enhancing agricultural livelihoods, given water and other natural resource constraints.

The appropriateness of this selection is supported by studies from the World Bank and ADB. The World Bank study (McElwee, 2010) analysed exposure to climate change risk in terms of absolute numbers of households potentially threatened as well as sensitivity to climate change risk due to poverty, climate-sensitive resource dependency, migration, education or health status, or status as an ethnic minority, woman or child. The results showed that the greatest numbers of households potentially threatened are in the North and South Central Coasts and Mekong River Delta and that the greatest sensitivity (vulnerability) to potential threats occurs in the Northwest, Central Highlands and Mekong River Delta. The ADB studied natural disaster and damage severity (ADB, 2008), finding that the currently most vulnerable areas to climate risk are the Mekong River Delta, Central Highlands, Northern Mountains (especially the Northwest) and Central Coast (especially the North Coast).

Potential priority investment areas.

The main imperatives that climate change considerations should add to the next COSOP are those related to the importance of ensuring that (i) sustainability concerns are integrated into investment planning and implementation; (ii) appropriate tools and instruments are developed and applied to achieve that integration; and (iii) adequate incentives and follow-up are included in investment programmes to guarantee that appropriate attention is given to execution. In terms of ensuring that the COSOP programme is climate smart and makes significant contributions to the sector, consideration should be given to investments in:

- **Knowledge management:** Knowledge management should be a central thrust of IFAD's support, especially for climate change-related learning. IFAD projects, through their community presence, experience and knowledge, should be exploited to develop systematic learning and knowledge dissemination processes for

pro-poor, climate-smart agriculture and rural development. The goal should be to inform provincial-led implementation efforts and bring field-based learning into national policy discussions. In terms of provincial-led implementation, it is crucial to support provincial governments in learning, given the decentralization of fiscal resources and management responsibilities and these officials' need to learn quickly how to improve practices, methodologies, efficiencies and outcomes. In terms of bringing field-based learning to national policy discussions, there is unmet demand for consultation on policy implementation and field-based learning in support of high-level policy dialogue.

One option would be establishment of a thematic ad hoc group in MARD for RCC-ARD knowledge management and learning from the field. This mechanism was successfully utilized in the past, through the International Support Group (ISG), to support MARD and international donors in ODA coordination and policy dialogue. (One example was for implementation of the Comprehensive Poverty Reduction and Growth Strategy in Agriculture and Rural Areas.) Ideally the coordination mechanisms would also support forums/workshops at provincial and national levels to inform policy dialogue and deliberations. Such forums, which would have broad stakeholder representation, would be held to review lessons and generate discussion on policies and strategies for climate change response.

- **A comprehensive pilot for a climate change and sustainable livelihoods project:** In the Mekong Delta the combination of sea level rise, salinity intrusion, increased incidence of extreme storms, growing deficits in freshwater supply during the dry season and susceptibility to long-term flooding will result in significant upheaval in local livelihoods over the next two to three decades. There is also high likelihood of economic displacement affecting a very large number of rural people as their current livelihood activities are lost to rising sea level and/or salinization and increasingly scarce fresh water resources.

  Assistance is needed to help people adapt to new agricultural and aquaculture systems and shift to entirely new activities (e.g. mariculture) in response to the opportunities created by the new biophysical conditions. They will also need to prepare to migrate under more favourable conditions (e.g. with an education) as conditions require.

  JICA is supporting a master planning exercise in the Mekong River Delta and assisting the Government to develop a coherent approach for managing climate change impacts there. An IFAD programme on pro-poor adaptation to climate change could capitalize on the plan and put into place planning and livelihood elements for the rural sector, thus contributing to overall implementation of the master plan. The project strategy would be to operate along a transect inland from the coastal zone to aid development of comprehensive adaptation and mitigation alternatives along the gradient of sea level rise and salinization impacts. The focus would be on ensuring climate-smart livelihoods for sustainable economic development among ethnic minorities and rural poor households. This would be achieved through scaling up alternative land use systems, farming practices and climate-proof pro-poor value chains; research and development of adapted production systems (e.g. breeding and production of a salinity-tolerant strain of catfish); and policy, institutional and incentive frameworks that support pro-poor adaptation measures.

  As a learning process, the project would provide valuable insights and assist in developing best practices concerning where, when and how to support poor rural communities. In conjunction with an effective knowledge management

programme, such a project would provide a platform to identify, test, adapt, disseminate and replicate instruments, technologies and systems for pro-poor climate change adaptation.

- **Disaster risk management and vulnerability reduction:** Whether it is seen as climate change response or disaster risk management is less important than the fact that climate (or weather) risks are not currently being appropriately factored into the Government's ARD programmes directed at IFAD's target groups. Large and avoidable losses are occurring. Also quite weak are responses for reducing vulnerability to natural disasters, e.g. through application of simple land-use planning tools at the community level and integration of those into decision-making criteria for rural investment (SEDP process) and CBDRM approaches.

- **Policy:** It is not apparent that the national dialogue on climate change in the ARD sector has internalized rural development and poverty reduction objectives or concepts. Increasingly, initiatives related to climate change are claiming limited public resources, and this trend will only continue in the coming decades. It will be important for IFAD to engage in this dialogue to promote climate-smart orientation of adaptation and mitigation resources towards two groups: (i) those who are 'permanently vulnerable', living where persistent, structural poverty makes natural resource-based livelihoods non-viable and alternatives are needed or (ii) those for whom 'temporary' poverty becomes persistent poverty due to recurrent losses from drought, flash flooding and other phenomena related to natural disasters and climate.

- **Research and development:** Support for development of pro-poor adaptation responses would be well-justified in a number of areas, as would policy-oriented research that would support the development of pro-poor approaches in climate change response policy and strategy. Among the former would be R&D for adaptation and climate proofing of production systems that are important for the poor. These may fall into two categories: (i) adaptation of systems in which private sector participation is unlikely, for example, adaptation in maize cropping systems and conservation of traditional maize germ or improving resilience through diversified production systems and landscapes for the uplands; and (ii) adaptation for which private-sector interests exist and therefore public-private partnership approaches are preferable, with some cost-sharing to ensure that smallholders and poor farmers benefit from the outcomes, for example, breeding of saline-tolerant catfish.

  Examples of relevant policy-oriented research include identifying likely adaptation pathways in high-poverty areas and analysing policy and operational needs for removal of barriers to adaptation by the rural poor; and evaluation of current policies and programmes and their effectiveness in assisting those populations most vulnerable to climate-related risk (natural disasters) to adapt and reduce vulnerability.

Key conclusions and recommendations

Conclusions. Viet Nam is clearly a country that will face disproportionate effects from climate change over the coming decades. The Government has thus taken a proactive approach, extending back as far as the mid-1990s with the MONRE-IMHEN vulnerability assessment of Viet Nam's coastal zone by MONRE and the Institute of Meteorology, Hydrology and Environment. In more recent years, Viet Nam has seen an enormous increase in the number of strategic and operational initiatives to confront climate risk and climate change. Since 2008, with approval of the NTP-RCC and the Action Plan Framework for Adaptation to Climate Change in the Agriculture and Rural Development Sector, investment in climate change response has tripled relative to the investment of the previous 15 years. From 2008 to the present, at least US$0.9 billion has been committed for adaptation, mitigation, capacity-building, research and awareness-raising investments. While the NTP-RCC is not yet an operational strategy capable of guiding the direction and use of these resources, nonetheless a mechanism has been established (the SP-RCC) and instruments developed (e.g. policy matrix) to orient both the institutional actors responsible for its implementation and their partners (ODA, NGO, private sector) who would contribute to and support its implementation.

The SP-RCC, which began operating in 2009, appears to be reasonably successful in this coordination role. MONRE, which is charged with implementation of the NTP-RCC, is reportedly developing an overarching strategy. In the meantime, the principal challenges would seem to lie more with the various line ministries, which are charged, under the NTP-RCC, with developing their own strategies and action plans for climate change response.

For the agricultural and rural development sector, MARD developed its national framework in 2009, and earlier in 2012 approved the strategy/action plan for its implementation: the Action Programme in Response to Climate Change of the Agriculture and Rural Development Sector during 2011-2015 and Vision to 2050. As discussed previously, while the longer-term vision is reasonably comprehensive, the priority investments in the five-year plan are unbalanced. Too little attention is given to agriculture and rural development concerns, and social goals are not addressed. The soft investments lack any indication that people are a focus or that the research and development of subsector and regional plans and priorities will be oriented towards meeting the challenges of developing more locally driven approaches to adaptation and avoiding one-size-fits-all approaches.

Critical issues for implementation of the programme are lacking, such as integration into the SEDP process, support for and facilitation of farmer-led adaptation processes, sustainable natural resources management and other 'soft' adaptation measures of the type required to increase local institutional capacity and social capital for building resilience. In addition, the RCC-ARD does not set out to address the mainstreaming of climate change responses into the ARD sector's other programmes, especially the poverty reduction and rural development programmes that fall under the NTP-NRD umbrella. It is clearly through those programmes that MARD and the provinces face the greater challenges (and opportunities) in working through how to ensure that rural development investments are climate smart and support both the building of adaptation capacity and adaptation processes themselves.

The increasing decentralization of fiscal resources and management responsibilities to the provinces means that they will encounter the greatest challenges in the coming years. The provinces will bear much of the burden of articulating ARD sector strategies, action plans and programmes to ensure that, on the one hand, they support adaptation, and on the other, they obtain the inputs and orientations required in order to climate-proof their investments. In addition to policy support and guidance from the national level, the provinces will need help to better understand the challenges, learn from provincial experiences and adapt national policies and programmes to meet their operational needs.

Recommendations for IFAD support to the Government. IFAD support will be needed at the national and provincial levels to help the country achieve the strategic objectives. The types of support required may be grouped into four areas, with the purpose of ensuring that climate change policies, strategies and programmes appropriately consider the needs of rural poor people and that government institutions have the tools for their implementation. The support areas are discussed below.

Institutional support. At both national and provincial levels assistance is required to improve coordination of efforts around climate change in the ARD sector. MARD's efforts, being carried out through ICD, should be strengthened. In particular, a large number of stakeholders – national and provincial government, donors, NGOs, mass organizations, academia and the private sector – must be consulted and organized to effectively participate in the policymaking and strategy development processes and to provide feedback and recommendations on the effectiveness of government programmes. IFAD could provide support directly to MARD and ICD through enhancing its capacity and developing approaches to improve engagement and communication with stakeholders, which in turn will ensure broader commitment by partners to government policies, strategies and programmes.[15] This would provide the institutional framework for discussion and coordination around climate change responses in the ARD sector as well as the platform for dialogue on inclusion of pro-poor climate change adaptation policies and investments.

Knowledge management support should be provided at the provincial level through IFAD's current and future projects. A general framework for capturing, synthesizing, validating and disseminating knowledge and best practices should be designed in consultation with the participating provinces. The framework would be implemented province by province, financed by each province's IFAD-supported projects. Topics of interest would include tools for planning of climate proof/climate smart investments (including CBDRM tools such as community hazard mapping); mainstreaming climate-proofing tools into SEDP planning and implementation processes; pro-poor climate change response options, including climate-resilient value chains and sustainable livelihoods; adaptation by communities and households, pathways for future adaptation, and obstacles to adaptation; emerging opportunities for complementing adaptation financing with mitigation financing; and learning how to scale up from households lands and production systems to land and natural resources management at watershed and landscape scales.

Linkages between the provinces (for exchange of information and learning) could be accomplished through the projects directly, but also through support at the level of MARD (as discussed above) to link provincial field-level learning and national policy dialogue. Dissemination of knowledge within the province (to officials, employees, staff, mass

15 The specific types of support required were defined through a consultancy, supported by IFAD, to evaluate MARD's ISG programme and propose its work programme for 2011-2015 (Smyle and Binh, 2009).

organizations, communes, communities, etc.) would require support for awareness-raising activities and links to the capacity-building activities supported by IFAD and other projects and programmes. The objective of a dissemination strategy would be to avoid creating parallel pathways and feed specific, relevant information to target audiences through existing institutional capacity-building pathways.

Support for research should be provided at the national level. One important area would be policy-relevant research to be carried out by MARD on social vulnerability to climate change and pro-poor adaptation/mitigation of climate change impacts. The other area of research would be in development, adaptation and validation of pro-poor climate change adaptive technologies and systems and on emerging opportunities and livelihood options created by changing climate. Funds could be provided through the proposed MARD coordination mechanism for carrying out research in these areas as agreed and prioritized with its development partners. Additional funding for these types of research would be provided to the provinces through their IFAD-financed projects. To the extent that research is financed on technologies or systems that would benefit private-sector investors in addition to the rural poor, partnerships with private-sector interests should be sought.

Support for the development of strategies for climate change response should be directed to the provinces and through design and implementation of IFAD-financed projects. In all cases, projects should support assessment of overall vulnerability of the ARD sector to climate change with an emphasis on social vulnerability, and the subsequent development and/or updating of climate-related risk/climate change action plans at provincial and district levels. At local levels, projects would do essentially the same thing, but with a focus on developing locally tailored strategies to facilitate adaptation. Within each province's vulnerability assessment, support should be provided to identify the principal, likely pathways for adaptation on an agroecoregional[16] basis. Once these are identified, a review of needs, opportunities and likely obstacles to adaptation should be made in conjunction with an evaluation of current agriculture, forestry, livestock and aquaculture policies to identify any policy obstacles to adaptation. These results would then be part of national discussions with MARD. Finally, to support the development of strategies and plans, it will be necessary to work closely with the institutions responsible (e.g. Departments of Planning and Investment, DARDs, etc.) to develop and/or validate planning tools for climate proofing, such as the IFAD/GIZ climate-proofing tool for value chains used in Tra Vinh.

The extension system should be broadened to include farmer-to-farmer transfer of adaptation technology and promotion of private enterprise service delivery. This is a critical area for continued institutional support and policy dialogue given the constraints (e.g. government cost ceilings).

With Viet Nam's membership in the World Trade Organization there is increasing need for producers to adopt new agricultural practices and meet new standards (e.g. good agricultural practices). This will be difficult for many producers, especially smallholders and poor farmers. If IFAD should support such production, it will take significant resources and efforts to introduce the new practices. Thus these farmers and production systems should be evaluated for climate risk up front, before investing in what might have a limited future. Where it makes sense to invest in increasing farmer capacity to meet good agricultural practices and export standards, given the farmers' significant investment, agricultural/climate risk insurance should be introduced at the same time, as part of the production and financing package.

16 An agroecoregion is a homogenous geographical area where the production environment in terms of agro-climate, resource endowments and socio-economic conditions is homogenous, and the majority of the farmers have similar production constraints and opportunities.

Operational concerns. From an operational perspective, the COSOP should avoid becoming too prescriptive, as threats, practices and opportunities will be determined by the context and content of future projects. However, there are important steps that should be taken during design and implementation of each project. During the design phase, there should be an analysis of current climate risk, potential threats from climate change and social vulnerability to those risks. This analysis should systematically capture local knowledge on current trends and adaptation responses being taken by communities and households. Subsequently, there should be preliminary analysis of likely adaptation pathways and options for vulnerable populations as well as a participatory analysis of the likely obstacles to adaptation. The objective is to incorporate appropriate design elements and risk management strategies into the design. An environmental management matrix is sometimes used to profile a project's approach to avoiding or mitigating environmental impacts, and the same approach could be taken for projects in terms of managing climate-related risk, natural disasters and climate change threats.

This report contains much detail on the important aspects of project implementation, e.g. support to knowledge management, integration through the SEDP process, application of climate-proofing tools in local planning. The policy, institutional and process-related interventions are arguably the most important at this time, given that it will take many years to get these right and to see them effectively applied for pro-poor and climate-smart public and private investments. The scenarios for climate change imply that there is time to get this right. However, should 10 years pass (which is a very short time in terms of reorienting large bureaucracies and institutions) without significant advances in developing appropriate policies, institutional frameworks and processes, the consequences are likely to be quite negative.

Institutional partners. IFAD's principal institutional partners for implementation will be:

- National government: (i) MARD, for policy, coordination and prioritization of investment project orientation and support to MARD's coordination and policy dialogue functions through ICD and its ISG programme; (ii) MPI, for integration of climate change considerations into the SEDP (IFAD should offer support to achieve this commitment, which is a part of the NTR-RCC); (iii) MONRE, for coordination of IFAD's overall support and contribution to climate change response in the ARD sector (this can be done most effectively through the SP-RCC); and (iv) MOLISA, for integration of climate change concerns into the local SEDP planning process for making national poverty programmes climate smart in their investments and implementation.
- Provincial government: (i) the People's Committees at all levels, which are charged with policy implementation and approvals of plans (SEDPs), and they should be a strong focus for awareness, capacity-building and local policy discussion (as recipients of outputs from knowledge management activities) and for raising lessons from the field to central level for policy dialogue; (ii) provincial and district departments of planning, which are charged with implementing the SEDP process; and (iii) DARD, for analysis, planning, research and technology transfer for climate change adaptation in production systems and for implementation of CBDRM.
- Donors: The current pipeline of activities contains little in climate change adaptation and mitigation from 2013 onwards. At present some of the principal opportunities appear to lie with JICA and the World Bank:
  - JICA is carrying out a master planning exercise in the Mekong River Delta. An IFAD pro-poor adaptation to climate change programme could capitalize on that plan and put into place planning and livelihood elements for the rural sector.

- The World Bank is developing a US$150 million Mekong River Delta Water Management for Rural Development initiative (2012-2017) under which IFAD might find opportunities to partner, particularly around support to the most vulnerable populations. It has also expressed interest in exploring opportunities to collaborate with IFAD on translating seasonal and other weather forecasts (including El Niño/Southern Oscillation patterns) into practical advice for farmers (planting decisions, irrigation, pest and disease measures) and early warning systems for financial institutions and input suppliers. This proposal is under development, and initial applications would likely address coffee production in the central highlands. Other crops, locations and types of farmers could be targeted while approaches are refined. A Central Highlands project is in the pipeline for which World Bank Bank staff have expressed willingness to explore collaboration, though at the time of writing no specifics were available. Finally, the World Bank is implementing a grant from the UK Department for International Development, ending in 2014, to provide technical assistance for enhancing capacity in MONRE, MOIT, MARD, MPI and MOF to formulate and implement climate change policies. Any support for MARD and policy research should be provided in close collaboration with the World Bank to avoid overlap.

Strategic objectives. Three key objectives must be achieved for the COSOP to deliver climate-smart outcomes (see table 6 for a results framework covering them). First, it will be critical to elevate the issues of pro-poor climate change adaptation and mitigation to the level of the ARD sector's policy dialogue. Second, the Government's principal instruments for addressing the needs of rural poor and vulnerable populations are its programmes for agriculture and rural development, poverty reduction and disaster risk management. While the RCC-ARD is important as well, it is only a partial instrument. Its role should be to ensure that these other programmes internalize natural disaster and climate change risks; support climate-proofing of rural communities and livelihoods; and make climate-smart investments. Thus there is a fundamental need to align these programmes and ensure that their investments jointly contribute to climate-smart rural development and poverty reduction in the communities where they operate. Third, the local level is where the various government support programmes will require articulation through the SEDP planning process. Therefore instruments and approaches to support local-level climate-smart investment planning and implementation through the SEDP process are essential.

TABLE 6

Proposed elements for consideration in the COSOP results management framework

Strategic objective	Outcomes for achievement of strategic objectives	Milestones showing progress towards strategic objectives
National level Pro-poor policies for agriculture and rural development sector's response to climate change	• Transparent targeting criteria on social vulnerability and sensitivity to climate-related risk • RCC action plans with pro-poor strategy • ARD DRM and poverty reduction programmes with RCC strategy	• Provincial knowledge management activities (IFAD provinces) and national stakeholder coordination mechanism (MARD) informing ARD sector high-level policy dialogue • Provincial assessments (IFAD provinces) of ARD sector vulnerability to climate change by social vulnerability and sensitivity to impacts criteria • Provincial departments of planning and investment (IFAD provinces) with guidelines for integration of RCC and CBDRM into SEDP planning
Provincial level Institutional and implementation arrangements for NTP-NRD, ARD-RCC, provincial DRM action plans and other relevant rural poverty reduction programmes aligned	• SEDP process functions to integrate poverty reduction, DRM and climate-proofing concerns into ARD public-sector investment programmes • Pro-poor targeting criteria for RCC applied to ARD public-sector investments • ARD public-sector investments climate-proofed	• Capacity building programme (IFAD provinces) for local government staff and communities on implementation of CBDRM/RCC-ARD and integration into SEDP developed and being implemented. • Incentive system for district/commune integration of CBDRM/RCC/NTP-NRD into SEDP (IFAD supervision, project indicators, project-based incentives, e.g. additional funding for success) • Climate-proofing tools for district/commune SEDP planning developed and tested (IFAD provinces) • Principal adaptation pathways identified for agroecological regions, barriers to adaptation analysed and institutional response strategies defined (DARD in IFAD provinces)
Operational level SEDP planning and investment climate smart	• Locally tailored strategies for RCC and climate change adaptation developed and under implementation at district/ commune levels (IFAD districts) • Community-based disaster/climate-related risk mitigation models tested (IFAD provinces) • Number of rural poor households reporting losses from natural disasters/weather-related phenomena declining	• Number of districts and communes (IFAD districts) applying climate-smart livelihood planning tools • Number of districts and communes (IFAD districts) with operational CBDRM/climate change schemes (steering committees trained; community hazard and vulnerability maps developed/updated; annual community plans on DRM/climate change adaptation developed; community monitoring implementation) • Proxy indicators for increased climate change resilience (losses from natural disasters/weather-related phenomena) developed, integrated in M&E system, and baseline established (IFAD projects)

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