THE WORKSHOP ON VULNERABILITY, ADAPTATION AND RESILIENCE TO CLIMATE RISKS: AN ASSESSMENT OF EDUCATION AND TRAINING CAPACITIES AND NEEDS IN SOUTHEAST ASIA

Chiang Mai, Thailand, April 1-3, 2007

VULNERABILITIES, ADAPTATION AND RESILIENCE TO CLIMATE CHANGE IN VIETNAM: CAPACITY NEEDS

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2007

1 Scenarios and impacts of climate change in Vietnam

Vietnam is located in the south-eastern extremity of the Indochinese peninsula and occupies about 331,688 square kilometres. It borders the Gulf of Thailand, Gulf of Tonkin, and South China Sea, alongside China, Laos, and Cambodia. The country has a north-to-south distance of 1,650 kilometres and is about 50 kilometres wide at the narrowest point. With a coastline of 3,260 kilometres, Vietnam has approximately 3000 islands with total area of more than 1600 square kilometres, and more than one million square kilometres of sea surface. Vietnam population is more than 83 millions , of which approximately 70% live in and rely on agricultural areas where major cash crop is rice farming. A strong economic growth of an impressive average rate of 7.3% p.a. in the last recent years (World Bank, 2004; UNDP, 2004). The poverty ration in Vietnam decreased from 58.1% in 1993 to 18.1% in 2006 (ADB, 2007). The poor mostly live in rural, isolated or disaster prone areas, which also have less financial support from the government compared to urban areas (Ninh et alt., 2006).
Vietnam lies in the typhoon centre of the South China Sea, which is one of the biggest typhoon centres of the world. Due to coincide of typhoon and rainy seasons, complicated topography floods and typhoons occur very frequent. It is evident that the increasing frequency and magnitude of tropical storms, accompanied by the occurrence of floods, was caused by the rapid climate change (CCFSC, 2005).
Coastal area of Vietnam is one of the most vulnerable areas being affected by climate change. Though accounting for only 12% of territory of Vietnam is the home of 23% population, which would be largely inundated by the sea level rise of 1 m in the future as an effect of climate change (Vietnam News, February 7th, 2007).
Recent progresses in climate change modelling have included the development of regional models with a higher resolution than previously available. New and more reliable projections for regions including South East Asia are now available. The ongoing Fourth Assessment process of the IPCC includes a draft review of the most recent regional climate projections for the South East Asian Region and a few results of these are given here. These regional climate projections are based on the IPCC A1B emission scenario and assess the change in the climate of South East Asia in the period 2079-2098 compared with that of 1979-1998 to be as follows (IPCC, 2007):

- The regional models have predicted between 1.5^{0}C and 3.7^{0}C temperature increase with little seasonal variation,
- Precipitation projections have varied considerable across different models. The average result of the models is a 6% increase in annual precipitation with a variation between -3% and 15%. It is predicted that there can be very large variations in precipitation change within the region as well as within different parts of Indochina.

Vietnam's Initial National Communication to the UNFCCC (2003) provides detailed predictions regarding climate change impacts in Vietnam of which the most important are summarized as follows:

- The average temperature is estimated to increase 2.5°C in 2070. Inland average temperature (focus mainly on the highlands) will increase 2.5°C, meanwhile the average

temperature of coastal area may increase 1.5°C. Possible effects of such increase will include a large area of the country suffer from drought, agriculture crops will be heavily lost, epidemic disease will increase and spread rapidly along the length of the country amongst other serious effects,

- Annual average high and low temperatures are also expected to increase. The number of days with temperature higher than 25°C will also increase. This increase will significantly affect the country's ecosystems, farming seasons, and human health,
- The North and the South regions are affected by the Southwest monsoon but the seasonal rainfall amount decreases in July and August and increases in September. October and November. In the Central, rainfall would increase with approximately 19 percent in the rainy season by 2070,
- The vapour transpiration rate will also increase due to a shift in temperature. Because rainfall is concentrated in the rainy season, rainfall in the dry season will decrease by 2070 in the Central of Vietnam and droughts will occur more frequently,
- Sea level in Vietnam has increased 5 cm within the past 30 years. Sea level is expected to rise up to 9 cm in 2010; 33 cm in 2050; 45 cm in 2070; and 1 meter in 2100,
- Over the past years, the typhoons landed to Vietnam in August in the North, in October in the Centre and in November in the South. But the typhoon season is observed to occur later and more southwardly in recent years,
- Climate change would lead to increasing the sea surface temperature in higher latitude region of Pacific Ocean. It will lead to more typhoons occurring in the northwest Pacific Ocean, affecting Vietnam, and
- In the next decades, sea surface temperature is predicted to rise, which will cause higher wind velocity in typhoons and will last for a longer period. The typhoon intensity will be stronger, especially during El Ninõ year.

Vietnam National Assembly approved the Environmental Protection Law in 1993. In 2000, after consecutive years of implementation of this law, Vietnam developed the National Environmental Protection Strategy for the period of 2001 – 2010. The general objectives of the strategy are to continuously protect and improve environment in order to raise the living standard and health of the people and to ensure the sustainable development of the country.
Vietnam signed the UNFCCC on 11 June 1992 and ratified it on 16 November 1994. The Kyoto Protocol (KP) was signed on 03 December 1998 and ratified on 25 September 2002. The Ministry of Natural Resources and Environment (MONRE) has been assigned by the Government of Vietnam to be the National Focal Agency for implementing the UNFCCC and KP and is the managing government institution for all climate change activities. The Designated National Authority (DNA) for CDM in Vietnam is placed under the International Cooperation Department of MONRE. A Working Team and a Technical Expert Group including officers and scientists from related ministries and agencies have been established to implement climate change projects.
Other ministries involved in climate change activities are: Ministry of Foreign Affairs, Ministry of Finance, Ministry of Planning and Investment, Ministry of Science and

Technology, Ministry of Industry, Ministry of Agriculture and Rural Development, Ministry of Training and Education, and Ministry of Trade.

A number of studies, projects and other activities have been conducted in Vietnam on climate change impacts and related issues.

Vietnam Initial National Communication to the UNFCCC (2003) was carried out under the Ministry of Natural Resources and Environment and includes an assessment of the potential impacts of climate change on major economic activities as well as an overview of key vulnerable sectors and potential adaptation measures. Adaptation measures are considered for water resources, agriculture, coastal zone, forestry, energy and transport, aquaculture, and human health.

Work on 'Vietnam Second National Communication' (forthcoming 2007) is in its initial phase. For adaptation, the focal areas will be water resources, coastal zone management and agriculture. MONRE carries out the work, which is supported by UNEP/GEF.

However, the traditional approaches extending from household practices at the local level, through informal institutions, including the self-reliance inherent, to institutions on a national scale, such as early-warning system on floods, need to be maintained and developed to empower local population to live/cope with, adapt to and in a long run, benefit from climate change impacts (Ninh et alt., 2007).

2. The major gaps with capacity building in Vietnam:

- Lack of comprehensive quantitative V&A assessment for key socio-economic sectors based on established methodologies, and hence the adaptation options derived earlier are only qualitative;
-Previous V&A assessment was only preliminary, and it was not conducted in a holistic and integrated manner;
- Lack of realistic data for assessing climate change vulnerability, including data for cost-effective analysis of various adaptation options and adaptation technologies;
- Lack of a national strategy for adaptation to climate change and its related disaster risk reduction, including prevention, preparedness and management;
- Lack of local expertise in the field of V&A assessment and integrated assessment (including integrated assessment modelling);
- Lack of assessment of the impacts of climate variability and extreme weather events on key socio-economic sectors;
- Capacity building is urgently needed in V&A assessment, including training on relevant methodologies.

(MONRE, 2006)

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