THE NATIONAL STATUS OF CLIMATE CHANGE ADAPTATION AND MITIGATION IN CAMBODIA

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1. INTRODUCTION

The Kingdom of Cambodia is located in Southeast Asia, covers an area of 181,035 km^2 with a total population is about 13.4 million people in 2008. Approximately 80.5 percent of this population lives in rural areas. Administratively, the country is divided into 23 provinces and 1 municipality (NSDPU, 2009-2013). As a least developed country, its GDP per capita has rose from US$297 in 2002 (NIS, 2003) to US$792 in 2010 (NSDPU, 2009-2013). On average, agriculture has accounted for more than 40% of GDP. Agricultural production is dependent on the annual flooding and recession of the Tonle Sap Lake and the Mekong River, which brings fertile alluviums to the central plains. Cambodia's climate is governed by monsoon and characterized by two major seasons: rainy season from May to early October and dry season from November to April. The annual average temperature is 28^oC, with a maximum average of 38^oC in April, and a minimum average of 17^oC in January.

2. IMPACT OF CLIMATE CHANGE IN CAMBODIA

Cambodia is one of the most disaster-prone countries in South East Asia with its vulnerability to annual floods and droughts. Under the low latitudes of tropic climate it is likely to suffer from the effects of global warming and is expected to experience higher and more intense rainfall. The evidence of greater climatic extremes are both declining rainfall in the dry season and more violent rainfall in the wet season, causing flash floods. Increasingly powerful typhoons also appear to be occurring (Oxfam Cambodia, 2005). Flooding and droughts are expected to increase in terms of frequency, severity and duration. Though, it rarely suffers from extreme weather events such as typhoons or even severe storms because it is protected by the surrounding mountain ranges (MoE, NAPA, 2006). One of the reasons why it is vulnerable to natural disasters is that the livelihoods of the majority of people depend directly upon natural resources, with a large proportion of its population occupied in agriculture and related sectors, including animal husbandry, forest as well as fisheries. Extreme poverty, which limits access to food, water and other basic amenities, leads to the increasing of vulnerability. These characteristics heighten Cambodia's exposure to the impacts of climate change too (Oxfam Cambodia, 2005). Recent study shows that Cambodia is not highly exposed to climate hazards (except the Mekong Delta on the border to Vietnam) all its provinces, but are vulnerable to climate change due to their limited and low adaptive capacity and dependence on climate-sensitive livelihood (Anshory Yusuf and & Fransisco, 2009).

Agriculture, fisheries, forestry, human health and coastal zones are most vulnerable against the impacts of climate change. Projected changes in climate could have major consequences on hydrology and water resources, agriculture and food security, terrestrial and freshwater ecosystems, coastal zones and marine ecosystems, and human health (MoE, NAPA, 2006). The potential impacts of climate change will increase threat to life, communities, livelihoods and life-supporting systems, which are likely to cause considerable economic losses, social and environmental impacts. These include changes to rice productivity, to fisheries production and irrigation system; acceleration of forest degradation including the loss of wet and dry forest ecosystems; inundation of the coastal zone and higher prevalence of infectious diseases. Higher temperatures and humidity will create conditions for increased incidence of malaria and dengue fever, increase in the number of people exposed to vector and water-borne diseases. Accelerated loss of biodiversity will cause a decline in ecosystem services. Coastal community and ecosystems are likely to be affected by rises in sea levels. Thus, climate change is likely to have multiple impacts across sectors. The poor and marginalized, particularly women and children, will be worst affect.

3. CURRENT CLIMATE CHANGE ADAPTATION INITIATIVES

3.1 STRATEGIES, POLICIES AND LEGAL FRAMEWORK FOR CLIMATE CHANGE ADAPTATION AND MITIGATION

Responding to the urgent need for climate change issues and impact, **Cambodia ratified the United Nations Framework Convention on Climate Change** (UNFCCC) on 18th December 1995 and launched the first climate change project to help prepare the Cambodia's Initial National Communication (UNDP/GEF) in 1999. In addition, the environmental protection law which was approved by the national assembly in 1994 is also one legal document which is supporting the climate change. **Cambodia acceded to the Kyoto Protocol on 4th July 2002**, which put into force on 22nd August 2002. The first formal communication with UNFCCC and Kyoto Protocol also took place at the same year as the Ministry of Environment was appointed to be the National Focal Point and has submitted the **Initial National Communication (INC)** to the CoP-8 in New Delhi, India.

In 2003, the Ministry of Environment (MoE) started to work with other concerned Ministries to develop a **National Adaptation Programme of Action to Climate Change (NAPA)**, endorsed by the Council of Ministers on 20 October 2006. The **NAPA** is supportive of the RGC's development objectives outlined in The updated of National Strategic Development Plan (NSDP), 2010-2013, adopted in June 2010. The NSDP stresses the need to improve agricultural productivity through the expansion of irrigation and the management of water resources to reduce vulnerability to disasters. Implementation of the Cambodian NAPA will contribute to the achievement of the Cambodian Millennium Development Goals (CMDGs). Furthermore the Rectangular Strategy Phase 2 stresses the RGC commitment to mobilize resources to address climate change. The NAPA project is funded by the international donor community through its contributions to the Global Environment Facility (GEF) and the identification of priority adaptation activities is the main goal of its formulation exercise. The formulation of the NAPA follows a participatory process that involves those who are most affected by climatic impacts, that is rural people and the poor. The NAPA builds upon existing coping strategies implemented by local communities in order to enhance their adaptation capacity. The NAPA process led to the identification of **39** adaptation projects in four key sectors, namely, agriculture, water resources, coastal zone and human health. These are primarily "no-regret" adaptation options focusing on capacity building/training, awareness raising/education and infrastructure development. Of these, 20 are proposed as high priority projects (16 non-health and 4 health), with total estimated budgets of US$129 Millions. *The Prime Minister Samdech Hun Sen urges* "*All concerned ministries and agencies shall make their utmost effort to integrate the priority projects identified (in the NAPA) into their respective sectoral plans*". *More specifically, the objectives of the NAPA project are: (1) to understand the main characteristics of climate hazards in Cambodia (flood, drought, windstorm, high tide, salt water intrusion and malaria); (2) to understand coping mechanisms to climate hazards and climate change at the grassroots level; (3) to understand existing programmes and institutional arrangements for addressing climate hazards and climate change; (4) to identify and prioritise adaptation activities to climate hazards and climate change.* However, Cambodia currently has a limited internal capacity to fund climate adaptation activities. As of to date, two project proposals developed based on NAPA, have received funding from donors: (i) "Building capacities to integrate water resources planning in agricultural development in Cambodia" (UNDP and LDC Fund), and (ii) "Vulnerability Assessment and Adaptation Measures for CC in the Coastal Zone of Cambodia" (UNDP, UNEP, LDC Fund and the EC Global Climate Change Alliance). Beside these two NAPA follow-up projects, a number of small-scale projects on water resource management to adapt to climate change have been implemented under the UNDP/GEF Small Grant Programme by selected community-based organizations and local NGOs. (TP, 2010).

To ensure the issues of climate change have been addressed properly at the national and international level, in July 2003 the Royal Government of Cambodia has appointed MOE as the interim **Designated National Authority (iDNA) for the Clean Development Mechanism (CDM)**.

In 2006 the Royal Government of Cambodia (RGC) has established the **National Climate Change Committee (NCCC)**, which is chaired by the Senior Minister of Ministry of Environment and, Prime Minister is the Honorary Chair. The NCCC is based in the MoE and its secretariat is the Climate Change Office, which has been functioning since 1999 as a project unit although limited staff, financial resources and mandate has restricted its effectiveness and later on it was extended to the Climate Change Department in 2003. The NCCC comprises senior policy-makers from 20 ministries and serves as a policy-making body that coordinates the development and implementation of policies, plans, and measures to address climate change issues within Cambodia. The NCCC is responsible inter alia for (a) coordinating the implementation of climate change activities in Cambodia; (b) developing climate change policies, strategies, legal instruments, plans and programs; and (c) the integration of climate change concerns into relevant policies, strategies and legal instruments. It has been partly effective in carrying out its mandate but has only recently begun to meet regularly to address climate change issues. (PPCR, 2009).

In order to perform its tasks in effective way, the Royal Government of Cambodia (RGC) has established **the Cambodia Climate Change Alliance (CCCA) in 2010** which is launched on 25th February, under the initiative supported by the Climate Change Trust Fund of 8.9 million U.S. dollars which covers the period 2010- 2012 from the European Union, UNDP, SIDA, and DANIDA. Component 1 of the program builds on the activities of UNDP and DANIDA and will focus on capacity building and institutional strengthening of the NCCC and CCD in order for them to support Government, academia, and civil society in mainstreaming climate change considerations into policies, strategies, plans and programs.

3.2 ADAPTIVE CAPACITY BARRIERS

In Cambodia, the NAPA (2006) highlighted the following barriers related to capacity for adaptation that will need to be addressed:

a) Limited financial resources or funding for climate change related activities, especially in the health and agriculture sectors;
b) Few climate change studies and little experience within the country;
c) Lack of climate change research and/or training institutions in the country;
d) Lack of data availability and reliability and , in particular, absence of a formal mechanism for information sharing;
e) Limited cooperation and coordination among institutional agencies related to research or studies on climate change and climate variability;
f) Relatively low technical capacity of local staff;
g) Relatively low government salary and limited incentives from the climate change project;
h) Non-comprehensive national climate change policies and/or strategy;
i) Lack of qualified national experts in the country;
j) Limited public awareness and education on climate change; and
k) Limited technical, financial and institutional resources for adaptation.

4. CLIMATE CHANGE IN FISHERIES AND AQUACULTURE SECTORS

Fisheries are critical to human well-being in Cambodia, where fish provide up to 80 percent of all animal protein in the diet. Capture fisheries and aquaculture contribute about 10 per cent of Cambodia's gross domestic product and are even more important in terms of local livelihoods. Fishing and related activities are the primary sources of income for about one third of the people living around Tonle Sap and a secondary source of income for half of those who live around Cambodia's great lake.

According to World fish Center, there is a recent global study classified Cambodia as highly vulnerable to the effects of climate change on fisheries. These findings were based on assessments of Cambodia's dependence on fisheries, the magnitude of expected climate change in the country, and its adaptive capacity. This vulnerability makes it important that Cambodian fisheries receive the support necessary to adapt to and cope with climate change.

Yet the current Cambodian National Adaptation Program of Action for climate change (NAPA) does not prioritize adaption planning for capture fisheries in lakes, rivers and wetlands, despite their importance to the national economy and their vulnerability to climate change. However, current 10 year strategic plan of FiA has included measurements to adapt to CC as the following:

- Promote Coastal and inland aquaculture and rice field fisheries to supply of fish and give the important role of women in this work, for generating employment and income opportunities.
- The Growth Seaweed culture in coastal has demonstrate the potential of small scale fisheries expansion.
- The use of crab banks will offer the considerable potential improving the wild stock and and for crab fattening.
- Collaborative approach between government/NGOs and landless poor people also have potential turn unused but suitable state owned land into farming areas to help poor people graduate out of poverty.
- The Expansion of rice filed fisheries production through the improvement of wilder wetland management and the wild spread introduction of fish refuges in many areas of the country.

7. CONCLUSION

In conclusion, Cambodia is one of the vulnerable countries to climate variability. The climate change issues in Cambodia are concerned with the natural disaster hazards, mainly flood and drought that affect mostly to socio-economic development and environmental and biodiversity conservation. Therefore, national policies, strategies, mechanism as the national framework for responding these climate change issues and challenges climate change adaptation to the related hazards have been adopted. Furthermore, integrating adaptation into development cooperation is very important, as it provides practical support with the integration of adaptation measures into project activities, for example, in

projects relate to disaster risk reduction, coastal zone and water management, the conservation of natural resources and ecosystems, or rural development, as well as poverty reduction.

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