



CLIMATE CHANGE ADAPTATION AND LIVELIHOODS IN INCLUSIVE GROWTH: A REVIEW OF CLIMATE CHANGE IMPACTS AND ADAPTIVE CAPACITY IN CAMBODIA

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KEY MESSAGES

- Climate change is likely to disrupt forest productivity, decrease biodiversity and hasten forest degradation. Human-induced change could have further disastrous consequences, depleting forest resources, and hampering local livelihoods.
- The combined effects of changes to the natural system (rainfall, temperature) and human-induced (upstream land-use) changes are disrupting hydrological regimes. If this situation is left unregulated, fish stocks will diminish and fishers will face greater hardship.
- Environmentally sustainable development and natural resource co-management are imperative for inclusive economic growth, social progress and poverty reduction. Climate change adaptation and mitigation are key to this.
- Adaptive capacity – individual, institutional and community – should be developed to enable Cambodians to prepare for disasters and to adapt to climate change. The financial, technical and human resources, and legal frameworks, needed for this are not yet in place.
- Rural women are especially vulnerable to the impact of climate change. Disasters such as

flood and drought damage livestock, fields and crops, as well as other assets, pushing them into even greater hardship.

THE PROBLEM

The majority of rural Cambodians rely heavily on natural resources – mainly water, fisheries, forests and land – and agriculture for their livelihoods. Because irrigation systems cannot supply sufficient water, farming is mostly rainfed. This leaves men and women farmers dependent on rainfall distribution, which is vulnerable to climatic variability.

In response to this threat, and recognising that future agricultural development and sound climate change adaptation depends on effective land and water management and community strengthening, Cambodia has committed to rehabilitating and constructing irrigation systems. At the same time the government has begun to implement the National Adaptation Programme of Action (NAPA) to Climate Change, and supported the adoption of integrated water resource management (IWRM) and participatory irrigation management and development (PIMD). These principles encourage farmers' greater involvement and participation in water management. Even so,

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factors such as limited human and financial resources, lack of information, low governance and local participation, and so on, constrain local communities' capacity to conserve the water on which they depend.

THE CASE STUDY

This policy brief reviews the main findings of a recent CDRI study² that examined existing knowledge of climate change impacts, vulnerability and adaptation, and assessed the limitations of different frameworks and approaches used by various initiatives in Cambodia. Specifically, the study explored the impacts of climate change on livelihoods through three dimensions: (1) agricultural practices and policy; (2) the role of community-based natural resource management (CBNRM) in managing natural resources and implementing community-based adaptation (CBA) strategies; and (3) gender equality. The study drew conclusions from an extensive literature review.

KEY FINDINGS

Agricultural Technology and Extension Services

Agriculture: Government institutions, private sector and civil society organisations (CSOs) have gradually stepped up the provision of agricultural extension services and training for farmers in the most climate sensitive areas. They have done this through on-farm demonstrations of new heat- and drought-resistant crop varieties, land and water management, and soil fertility enrichment and restoration. The introduction of climate-

² Nang P. (2013), *Climate Change Adaptation and Livelihoods in Inclusive Growth: A Review of Climate Change Impacts and Adaptive Capacity in Cambodia*, Working Paper Series NO. 82 (Phnom Penh: CDRI)

³ REDD+ is a global initiative designed to pay groups or countries for protecting their forests and reducing emissions of greenhouse gas pollutants, especially CO₂. It aims to reduce net emissions on a global scale.

smart agricultural practices and technologies should help to improve land husbandry and water use efficiency. However, the under-resourcing (funds, equipment, qualified extension workers) of agriculture and related research means that these are insufficient to meet the needs of local farmers, particularly women (CDC 2002; MAFF and MOWRAM 2010).

Community-Based Natural Resource Management and Climate Adaptation

Forestry: Effective forest management plays a vital role in climate change mitigation and adaptation. Tin (2010) draws attention to practical adaptive measures for maintaining forest ecology, including the creation of green corridors as protected passageways for wildlife and to conserve biodiversity, reforestation of denuded land, introduction of drought-tolerant species and improvement of soil and land use management. A number of forestry communities have joined the Cambodia Reducing Emissions from Deforestation and Forest Degradation (REDD+) programme.³ However, recent assessments of REDD+ have found that its progress is slow. This is because public and private sector institutions and NGOs have limited capacity and working knowledge of REDD+ benefit-sharing policies and mechanisms, and poor understanding of carbon markets, carbon pricing and budgeting (Stevenson 2012).

Fisheries: The government has worked to establish effective fishery (marine and inland) management communities and to reduce illegal habitat destruction. Climate change in Cambodia could intensify many water demand and supply problems. However, community fisheries are frequently ill-prepared, technically, financially and institutionally, to take on responsibility for larger areas. These hinder them from improving their livelihoods despite the government's bold fishery reforms that have notably released former private fishing lots for public access (Kim *et al.* 2013). The MOE (2002) reports that a one metre rise in sea level would permanently submerge about 0.4 percent of the total area of Koh Kong

province and seriously damage mangroves, forest, aquaculture, grassland and human settlements. Local people's resilience is relatively weak and likely to remain so without concerted efforts and proper integration of water, food (from natural resources and agriculture), energy, climate change adaptation and local knowledge into decision and policy-making.

Water security: Cambodian farmers are still highly dependent on rainfall distribution, which determines the size and success of the harvest. To ensure water security for agriculture and to protect against climate-related risks (flood and drought), the government has rehabilitated existing irrigation systems, built new water infrastructure and committed to establishing effective water management along the principles of integrated water resources management (IWRM) (MOWRAM 2007). However, some irrigation schemes have been designed with sparse hydrological knowledge, lack of information and little local participation.⁴ These limitations have led to inequitable water allocation, water scarcity, conflict among water-users, lack of ownership, unclear stakeholder responsibilities, poor maintenance and ineffective irrigation management (Chem and Someth 2011).

Women's role in CBNRM and CBA: A combination of mitigation and adaptation strategies is required to help local communities to build resilient, sustainable livelihoods (Buechler 2009). There is a need for multi-stakeholder participation (grassroots men and women) in public affairs at all levels. Women are encouraged to take decision-making roles in CBNRM committees, but traditional cultural and socioeconomic barriers, coupled with low literacy and weak skills, inhibit them from expressing their views and fully participating. As a result, CBNRM committee work is mainly led by men.

⁴ Reasons include too short a time for project implementation, and undertaking the project during busy cultivation or harvesting periods.

RECOMMENDATIONS

National Level (Policymakers, Development Partners, Academics)

- Improve cross-sectoral coordination to ensure coherent policy interventions, information sharing, incentive mechanisms and financial support. These will foster the uptake of new strategies and technologies to cope with climate change.
- Integrate adaptation initiatives into agriculture and irrigation system development and natural resource management to reduce vulnerability and to secure agricultural sustainability.
- Strengthen CBNRM and CBA while minimising unfair governance practices, inequalities and lack of livelihood diversification opportunities.
- Assess different effects of climate change in Cambodia's four agro-ecological zones and shape climate adaptation strategies accordingly.
- Apply a "gender lens" to all aspects of policy formulation and development planning, particularly in the agriculture sector, and CBNRM to ensure that benefits reach both men and women.

Sub-national Level (Practitioners, NGOs, CSOs, Private Sector)

- Improve people's capacity to manage the natural resources and environment, to reduce disaster risks, and to adapt to climate variability in the short and medium term.
- Strengthen coordination between and within state departments, community organisations and private sector agencies, and among academics, to improve CBNRM and CBA.
- Heighten law enforcement measures to eliminate illegal activities that threaten natural resources and local livelihoods, and strictly monitor economic development activities to ensure that they follow state policies.
- Promote investment in "smart" agriculture development and climate resilient livelihoods, and explore new opportunities, practices and

technologies that would help farmers to cope.

- Improve agricultural extension services, and weather and climate variability forecasting and information sharing.
- Promote gender mainstreaming and women's participation in decision-making and implementation processes for climate change adaptation.

Community Level (Local Authorities, CBNRMs, NGOs, CSOs, Private Sector)

- Promote coordination between provincial departments, NGOs and private sector agencies to build the capacity of communities and foster their greater involvement in decision-making on natural resource management and climate change adaptation.
- Minimise unsustainable agricultural practices while encouraging the adoption of climate-smart agricultural techniques and technologies and livelihood diversification.
- Collaborate with relevant institutions to assess the effects of climate change, identify the areas most at risk from climate hazards (flood, drought, windstorm), and assess the adaptive of communities in general and vulnerable households/groups in particular to determine appropriate mitigating strategies and measures.
- Improve and strengthen community ownership, legitimacy, co-management roles and responsibilities, and local participation (men and women) to ensure the success of CBNRM.
- Establish mechanisms to provide awareness-raising and training for men and women in resource-user communities and other vulnerable social groups so that they can participate effectively in CBNRM and CBA.

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