

# RURAL WOMEN, GENDER, AND CLIMATE CHANGE



## A LITERATURE REVIEW AND INVITED PERSPECTIVES ON CLIMATE CHANGE IMPACTS AND PROCESSES OF ADAPTATION IN CAMBODIA



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## EXECUTIVE SUMMARY

Cambodia is considered one of the most disaster prone countries in South East Asia due to a lack of adaptive capacity in addressing climate related hazards. Hazards such as floods and drought are often cited as the country's main climate risks, but the country's vulnerabilities to climate change go well beyond these cyclic events. The climate challenge for Cambodia is dealing with persistent poverty, social and economic marginalization, and gender inequalities that exacerbate climate change impacts - often resulting in further food insecurity, environmental degradation, and the limiting of options for the poor to adapt to climate change. Knowing this, Oxfam America has taken an active role in highlighting connections between climate change and its impact on the livelihoods for poor men and women - with particular emphasis on adaptation financing and awareness-raising. However, Oxfam America sees much room for improvement and expansion to their efforts respective of women's rights, and gender equity in the climate change arena; ensuring that climate change policies and adaptation support incorporate the needs and interests of women as well as men, and to ensure that women's constituencies are represented in the climate change decision-making and planning processes.

To help guide future work, Oxfam America has commissioned this literature review and invited perspectives to gain further insight into women and gender related vulnerabilities to climate change, and to learn more about how government and the development community in Cambodia is addressing these vulnerabilities through climate change adaptation support. Hence, the aim of the review is to surface root problem causes, knowledge and capacities gaps, and preliminary actions needed to address women and gender equalities in a climate change context.

This literature review notes that much of Cambodia's vulnerability to climate change is a consequence of its dependency on climate-sensitive livelihood sectors such as agriculture and fisheries - two (2) sectors highly dependent on the availability of natural resources; resources that tend to be reduced by climate extremes. This presents problems for the poor, especially women, mainly because they represent the majority of Cambodia's poor and are proportionally more dependent on threatened natural resources. This scenario has spurred numerous climate change adaptation efforts throughout the country focused on improving the management of natural resources and the productive use of ecosystem services. Other efforts have focus on building resilience in the agriculture sector through infrastructure and technology inputs, and on improving resilience at the community level through robust efforts on disaster risk reduction related to human safety, health, and nutrition... but have women benefited equally from such efforts?

Literature reviewed consistently points to gender and social stereotypes as influences to who will be most affected by climate change impacts, and has defined the constraints to women's adaptation as constraints resulting from resource access, allocation, and elements of society. Hence, Cambodia's challenges in dealing with climate change are not unique, and that overcoming these challenges will highly depend on how sustainable development in the country will be expressed, and how effective gender mainstreaming initiatives can address social stereotypes - from discourse to actions. Literature and invited perspectives also highlight that for gender mainstreaming to become effective, such must begin with investing in the building of women's capacities to effectively participate in and benefit from development initiatives, e.g. improving women's access to land, control of credit, and ensuring that agricultural inputs meet their immediate needs; and the sensitization of 'leaders' to understand and express equity, equality, and human rights actively.

Literature reviewed highlights Cambodia's climate change gender related insecurities - from lapses in opportunities for women to participate in decision-making processes that affect their lives, to women's increased dependence on informal loans to ensure family food security, to the lack of mobility for women to avoid 'disaster' stemming from their domestic and agricultural responsibilities, and a lack of access to capacity building services such as education, credit, training, and health. Deeper analysis of the literature notes that these 'gender insecurities' are directly related to traditional gender roles for women... strongly indicating that Cambodia must direct equal attention towards addressing both climate and social vulnerabilities. And yet, literature reviewed also brings forth discourse around distinguishing between

vulnerabilities associated with poor sectoral responses to the needs of the rural poor and the causes of women's vulnerabilities and gender inequities in a climate change context.

Issues identified in this review respective of women, gender, and climate changes are:

- Disproportionate access to financial resources, land, natural resources, education, health, rights, and development services;
- Lack of capacity (knowledge, assets, and access to development services) to capture opportunities to diversify agricultural practices and lessen dependencies on climate sensitive and stressed natural resources amongst the extreme poor;
- A marked skew in economic development – that which puts emphasis on creating opportunity at the expense of the disempowered – a result of governance being selectively implemented on the ground; and
- Barriers to women's participation and gender mainstreaming because of social stereotypes active within government and the development community itself – Minds, Attitudes, and Processes (MAP) employed.

Capacities are needed to address these issues effectively; the following are brief examples of knowledge and analysis needs identified in the literature:

- Knowledge on how social networks and alternative micro-finance mechanisms can be integrated with aspects of livelihood climate change adaptation capacity building;
- Knowledge on, and analysis of the interconnections between natural resource based livelihood activities and dimensions of vulnerability – including gender and ecosystem sustainability;
- Analysis of sector production declines, land use changes and the impact this has on the production and post-production activities of paid and unpaid women workers – particularly in the agriculture and fishery sector; and
- Analysis on the effectiveness of gender mainstreaming within government and non-government institutions – respective of policies, respective of policies, modes of implementation, and barriers to achieving positive impacts and forward momentum at the field level.

Recommendations brought forth suggest that first and foremost, institutions and organizations need to review their gender mainstreaming initiatives, and reflect on these vis-à-vis dimensions of practicality and risk; then focus on reducing identified risks to gender mainstreaming. Also recommended is the need to strengthen links between mainstream climate change adaptation practices, with ecosystem sustainability, community resilience respective of health and nutrition, and the impacts of livelihood amongst all sectors. To do so, research is needed to fully understand what drives autonomous adaptation, and how these strategies can be supported to move from a coping strategy to an effective gender responsive planned adaptation strategy... one that accounts for risks involved in taking on social stereotypes in the arena of community development.

Further recommended is the building of adaptive capacities at the grassroots level in how risk and vulnerabilities respective of the development processes we employ. Noted is that good solutions are easy to come by, but often lack practicality – in part because of available resources at hand... and in part how other sectors of society react when they see that 'solutions' will not benefit them equitably – be it economic to dimensions of empowerment to reductions in climate change risks. Moving past this will require Cambodia to make use of participatory multi-stakeholder process more effectively, e.g. adopting participatory approaches to project planning to policy making, to conducting participatory research consistently.

Overall, expressed is that climate change has distinctive gender dimensions in the sense that women and children are more exposed to its consequences, and that they have less influence over decisions related to climate change adaptation. The literature does not debate this, as it does not debate the need to push beyond gender mainstreaming and begin to address social stereotypes more aggressively for it is very plausible that this a key root problem cause of women's vulnerability to climate change impacts. Needed are scaled efforts to improve women's access to land, control of credit, agricultural inputs, and technologies. However, given efforts will first require marked adjustments to how development practitioners approach 'community empowerment', how government approaches equality and equity, and how Cambodians themselves openly express their own empowerment.

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## ACRONYMS USED

ACIAR	Australian Centre for International Agricultural Research
AIT	Asian Institute of Technology
ASDP	Agriculture Sector Development Programme
AusAID	Australian Agency for International Development
CBDP	Cambodian Community Based Disaster Preparedness
CBNRM LI	Community Based Natural Resource Management
CCDM	Commune Committees for Disaster Management
CCWC	Commune Committees for Women and Children
CDI	Centre for Democratic Institutions
CDRI	Cambodia Development Resource Institute
CEDAC	Cambodian Center for Study and Development in Agriculture
CI	Conservation International
CRCD	Cambodian Research Centre for Development
DPA	Development Partnership in Action
DRR	Disaster Risk Reduction
EEPSEA	Economy and Environment Program for Southeast Asia
EM-DAT	Emergency Events Database
FAO	Food and Agriculture Organization
GB	Great Britain
GDP	Gross Domestic Product
GEF	Global Environmental facility
HBF	Heinrich Böll Foundation
ICM	Integrated Coastal Management
IFPRI	International Food Policy Research Institute
IPM	Integrated Pest Management
IPPC	Intergovernmental Panel on Climate Change
IUCN	World Conservation Union
IWRM	Integrated Water Resource Management
MAFF	Ministry of Agriculture, Forestry, and Fisheries
MoE	Ministry of Environment
MoH	Ministry of Health
MoRD	Ministry of Rural Development
MoWVA	Ministry of Women's and Veterans' Affairs
MRC	Mekong River Commission
NAPA	National Adaptation Programme of Action
NBSAPs	National Biodiversity Strategies and Action Plans
NCDM	National Committee for Disaster Management
NGO	Non Government Organization
NTFP	Non Timber Forest Products
PADEK	Partnership for Development in Kampuchea
Prolinnova	Promoting Local Innovation in Agricultural and Natural Resource Management
RGC	Royal Government of Cambodia
UN-DAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNEP-AIT	United Nations Environment Programme – Asian Institute of Technology
UNFCCC	United nations Framework Convention on Climate Change
UNIFEM	United Nations Development Fund for Women
USDA	United States Department of Agriculture
WCCC	Women's and Children's Consultative Committees
WFP	World Food Program
WHO	World Health Organization
WWF-GMP	World Wildlife Fund Greater Mekong Programme

# RURAL WOMEN, GENDER, AND CLIMATE CHANGE: A LITERATURE REVIEW AN INVITED PERSPECTIVES ON CLIMATE CHANGE IMPACTS AND PROCESSES OF ADAPTATION IN CAMBODIA

## BACKGROUND

Oxfam America has been actively involved in international and national climate change advocacy work around climate and poverty impacts, with particular emphasis on adaptation financing and awareness-raising over the impacts of climate change on the livelihoods of poor men and women. Valid as this work is, still there is room for improvement and expansion to the scope of Oxfam America's work respective of women's rights, and gender equity in the climate change arena. By doing so, Oxfam America hopes to play an active role in ensuring that climate change policies and adaptation actions incorporate the needs and interests of women as well as men, and ensure that women's constituencies are represented in the climate change decision-making and planning processes.

Climate change is expected to compound and amplify development challenges, stresses, and problems in Cambodia; the driving force to this is likely to be severe water scarcity, and more frequent and intense cycles of flooding and drought, resulting in crop failures and food shortages. Additionally, accelerated losses in Cambodia's biodiversity will cause a decline in ecosystem services; services important to the rural poor's survivability and as assets to be harnessed to adapt to climate change impacts. Coastal communities and ecosystems are likely to be affected by rises in sea levels, and higher temperatures and humidity will create conditions for increase incidence of water borne diseases such as malaria and dengue fever. The poor and marginalized, particularly women and children, will be worst affected.

Literature points clearly to women being impacted more by climate severities; stressing further current burdens shouldered by women; in turn widening existing gaps in gender inequalities. Thus, the incorporation of women's interest and a gender lens must be a prerequisite for any effort to address climate change impacts effectively. Subsequently, to build effective responses to climate change impacts, integrated information about women, gender, and climate change at the household to national level of society is essential. Unfortunately, there has been little research on or analysis of women and gender vulnerabilities to climate change in Cambodia, but there may be useful resources available from previous 'gender' work on topics of environment, rural livelihoods, community managed health, and community empowerment that can be tap to highlighting key issues and to identify areas where further in-depth research is required. This literature review is a first step towards capturing learning from past initiatives, making connections, bringing forth current issues, and identifying areas for further research and analysis.

Important to this review is the setting of its 'understanding; how women's empowerment and gender is viewed. From Aguilar L., Castañeda, I. and H., Salazar (2002), women's empowerment can be taken in the context of the 'process through which women gain increasing power and control over their own lives. Such may involve aspects of awareness raising, development of self-confidence, and extended opportunities and options... a dynamic process where women gain increased access to decision-making which results in the transformation of unequal power relations between genders.' In the context of 'gender' and or gender relations; commonly cited in the literature... 'relations established between women and men as reflected in their daily life'. From the perspective of this literature, focus is placed on rural men and women in a living context; that encompassing the use, access and control of natural resources, development services, and relations within a given household, community and society.

Climate change impacts vary among regions, generations, age, classes, income groups, and gender. Based on the findings of the Intergovernmental Panel on Climate Change (IPCC), it is evident that people who are already most vulnerable and marginalized will also experience the greatest impacts. The poor, primarily in developing countries, are expected to be disproportionately affected by climate change; they are also the same people identified as having the least capacity to adapt to climate change; thus being significantly at higher risk to hazards brought on by climate variability and intensity (IOL, 2008). Additionally, the impact of climate change on men and women is not the same. Women are increasingly being seen as more vulnerable than men to the impacts of climate change, mainly because they represent the majority of the world's poor and are proportionally more dependent on threatened natural resources. Research by Mitchell, T., T., Tanner and Lussier, K. (2007), gives a brief, yet concise, overview of climate change, women, and gender, noting that women will suffer the most, simply because they are women, and women are poorer. Women make up 70% of the world's poor; they have less access to financial resources, land, education, health and other basic rights than men, and are seldom involved in decision making processes. As a reflection of this, women are less able to cope with the impact of climate change and are less able to adapt. However, research indicates that rural poor women have started to adapt to a changing climate and can clearly articulate what they need to secure and sustain their livelihoods more effectively: a safe home for family and livestock, better access to development services such as agricultural extension; training and information about adaptation strategies, and access to resources to implement effective strategies (Mitchell, T., T., Tanner and Lussier, K., 2007).

Taking 'climate change vulnerability' in context – exposure, sensitivity, and the degree of resident adaptive capacities to address climate hazards, women's vulnerabilities are bound closely to paradigms of equity and sustainable development. A look around Asia indicates that women are impacted far more than men in times of natural disasters. For example, women comprised 90% of 140,000 who died in a cyclone in Bangladesh in 1991 (Yocogan-Diano, V., and T., Kashiwazaki. 2009). This is a common experience among rural women in Asia for they have less access to information on how to lower their risk to hazardous events, and have less capacity to move from the path of oncoming hazardous events before they strike. Research also indicates that post-disaster, women again are more likely to become victims of domestic and sexual violence, more vulnerable to health related problems like nutritional deficiencies, and girls are often forced to drop out of school to help with recovery efforts. From a differing, yet linked perspective, financial resources channeled towards climate change discourse hardly include women's needs, yet women tend to bear a disproportionate burden of adjustment to climate change, and contribute less than men to greenhouse gas emissions (Peralta, A., 2008).

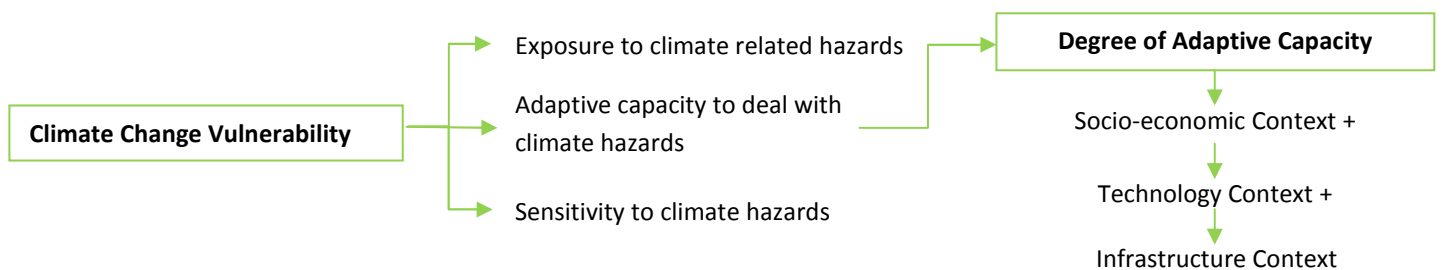
The World Conservation Union (IUCN) has produced a collection of gender focused 'factsheets' based on their global experiences and research on climate change and natural resources. Detailed consistently is a 'disproportionate burden' on women for they are more reliant upon common property natural resources for survival and income. In the context of natural resource conservation, be it for water, food, or livelihood etc., gender inequities can be summed up in differences between 1) roles and responsibilities, 2) tenure and access, 3) knowledge and information, 4) income and education, and 5) participation and power (CI, 2008). Interestingly, Siles (2010) points to women as a solution to climate change mitigation, but identifies the exclusion of their participation in natural resource management – ignoring half the population – resulting in a decrease in efficiency and effectiveness of natural

resource management strategies. These strategies often aim to mitigate the effects of drought and flood, and secure livelihoods as climate variability increases.

Climate studies have indicated that global warming will alter precipitation patterns. The 2007 assessment by the Intergovernmental Panel on Climate Change (IPCC) concluded that subtropical and some tropical areas will likely have increases in precipitation variability - declines and increases in rainfall intensities during and between monsoon periods (Schneider et. Al., 2007). The magnitude of this is important to areas of Southeast Asia, including Cambodia, where agricultural activities are concentrated on the cultivation of rice. As a consequence of such a great emphasis being placed on rice production as a staple food and as a livelihood for the rural poor; increased drought and flood intensities and seasonal variability respective of these will exacerbate current issues of food insecurity, household income instability, and household nutrition (CI, 2008). It is also important to note that increases in diarrhoeal disease, malaria, and dengue correlate with prolonged periods of flood and drought. Expected is that increased climate intensities and variability will also cause increases in endemic morbidity and mortality respective of the aforementioned (Schneider et. Al., 2007, and Haigh, C., and B., Vallely, 2010).

Literature shows a strong link between climate change and the ability of Cambodia and the global society as a whole to meet Millennium Development Goals, e.g. Goal 1 - Eradicate extreme poverty and hunger, and Goal 3 - Promote gender equality and empower women (UNFCCC, 2007). Thus, climate change impacts go beyond challenges to mitigating disasters, but to the heart of how gender inequities hamper society from gaining climate change resilience. Consistently referred to are the disproportionate impacts climate change has on men and women brought about by gender inequalities respective of access to natural and human resource, education, and or participation in society. Noted is that this often leads to a lesser capacity of women to cope with climate change, and to a lesser degree to adapt. In the following sections, this review will look at the nature of Cambodia’s vulnerabilities to climate change from a women and gender perspective. Following will be a brief review of Cambodia’s past and current efforts on the ground to adapt to climate change; and efforts that attempt to take a gender fair lens to these initiatives. Finally, this literature review will provide a synthesis to the aforementioned and recommendations for forward actions respective of knowledge, processes, and policy and governance needs to achieve equity amongst men and women respective of adapting to the impacts of climate change.

## 2.0 CAMBODIA’S CLIMATE CHANGE VULNERABILITIES



Climate change vulnerability and adaptive capacity in context - Anshory, A., and Francisco, H., 2009.



## 2.1 Flood and drought vulnerabilities

Cambodia is considered one of the most disaster prone countries in South East Asia due to a lack of adaptive capacities capable of addressing climate change related hazards (Anshory, A., and Francisco, H., 2009). The country has been hit by natural disasters, especially floods and droughts in the last decades, sometimes both disasters occurring in the same year. The occurrence of these disasters has not been uniform over years respective of geographical areas, or in terms of severity. EM-DAT (2007) data indicates that water-related disasters in Cambodia during 1987 to 2007 were dominated by incidents of flood; approximately 66.67% of incidents. A common scenario reported in the literature indicates that both runoff from the Mekong basin and heavy rains around the Tonle Sap Lake flood smaller rivers and parts of Siem Reap, Banteay Meanchey, Kampong Thom, Kampong Chhnang, Pursat and Battambang provinces. This flooding reduces the absorption capacity of the Tonle Sap Lake; resulting in water channeling downstream towards the Mekong river, subsequently causing floods in Kampong Cham, Kandal, Prey Veng, Svay Rieng and Takeo provinces (NCDM, RGC, and WFP, 2003a and NCDM, RGC, and WFP, 2003b, and MRC, 2005).

Specific to Cambodia, floods in 1999 affected 37,527 people, destroyed 17,732 hectares of rice fields, and 491 homes. In 2000, they affected 3,448,629 people, damaged 317,975 houses, and caused 347 deaths. This was shortly followed by 62 deaths, 70% of which were children in the 2001 floods; and the list goes on (WHO, 2007). In 2002, the Ministry of Health (MoH) reported 2,017,340 people were affected by drought.

During recent years, the occurrence of droughts in the Mekong region in general and in Cambodia in particular have caused concern, as this traditionally flood-vulnerable region has started to show signs of increasing vulnerability to drought (EM-DAT, 2007). A notable example was the drought of 2004, which began a couple of years earlier and grew to serious proportions. Literature points to Cambodia's vulnerability to drought as a result of its high dependency on agriculture. In 2004, 84% of Cambodia's population was engaged in agriculture or related activities, contributing to 31.1% of the country's GDP. However, assessments on climate change impact on, for example rice production, are perplexing in terms of the accuracy of climate impact reporting. Statistics indicate from 1999 to 2008, wet season crop area and production expanded 2.2% and 7.2% annum respectively, while dry season area and production increased by 5.5% and 10.5%. These figures indicate a degree of resilience to both flood and drought (USDA, 2010). Recent communications with District representative amongst the coastal provinces in Cambodia indicate that this is, impart, a result of dike expansion, improved irrigation management, and a switch to shorter stalk rice varieties that are more resilient to storm damage.

The continuous flow of water in the Mekong River is of high significance for Cambodia and it is essential that such effects are better understood in terms of climate change vulnerability. Literature points to climate variability resulting in a significant reduction in water supply in the Upper Mekong, exacerbating drought conditions in the lower Mekong in the dry season, and the deterioration in water quality (Chinvanno, 2006). Yet, literature also points to water management issues throughout the Mekong Basin; drought being more of a people and water resource management systems weakness to drought stresses rather than just a lack of water (Navuth, T., 2007). Noted has been the broad division between what is termed "physical scarcity", when natural water supply is simply insufficient to meet demands made on the resource in a sustainable manner, and economic scarcity, when it is lack of infrastructure that creates difficulty in accessing water for human needs. For Cambodia, placement of dams and the extraction of water by countries in the upstream reaches of the Mekong River will inevitably alter flow regimes and patterns of sediment and nutrient

transport. In addition, expansion of such programs in Cambodia will have the same consequences within the country. The implications of these activities are that downstream users will not necessarily have the same access to water as their upstream counterparts and that certain downstream activities (such as fishing) will be seriously degraded (CDRI, 2008).



Overall, literature indicates that Cambodians are specifically vulnerable to climate change because they depend upon subsistence rice agriculture for their food and livelihoods. Disasters like floods and droughts often exacerbate current conditions of food insecurity, low agricultural productivity, and poverty (Chinvanno, et. Al., 2006).

Un-sourced Photo: Damage to rice fields after Typhoon Ketsana hits Siem Reap, Cambodia, 2009

## 2.2 Livelihood vulnerabilities

Cambodia is highly vulnerable to climate change, due to the large proportion of its population dependent on climate-sensitive livelihood sectors such as agriculture, animal husbandry, and fisheries. These sectors are 'climate sensitive' as they are impacted by the availability of natural resources – often reduced by climate extremes (UN-DAF, 2010). Noting this importance, this literature review focuses on two (2) sectors mentioned.

### Agriculture

Research conducted by the Climate Change Department (formally known as the Climate Change Office) of the Cambodian Ministry of Environment state that agricultural productivity has declined between 2004-2007 and onward because of increased flooding, drought, and sea water intrusions (Oxfam, 2007). Impacts on rain-fed agriculture are of particular concern because farm livelihoods are largely based on this form of cultivation and highly vulnerable to climate stresses (Chinvanno et al., 2006). Variability of rice production in Cambodia does correlate with climate variability, primarily due to the occurrence of flood and drought as mentioned, and also storm damage. Data from the past five years showed that production losses were mainly due to flooding (more than 70% losses), followed by drought (nearly 20% losses). Production loss due to pests and diseases were insignificant in comparison. Literature also indicates that the frequency and intensity of floods may increase with changing climate conditions; in turn exposing farming households to even greater climatic risks as a result of their mono-culture farming dependency, and 'negative' climate change adaptation strategies that lower climate change resilience at the family and community levels (UN-DAF, 2010); for example:

- Withdrawing children from school (especially girls) to reduce family expenses, often resulting in an increase in child labor for off farm income generation;
- Reducing expenditure on health services perpetuating cycles of ill health and losses in livelihood productivity;
- Changing food choices to less expensive and often less nutritious food; and
- Reducing the intake of food (especially for women and older girls), which again perpetuates a cycle of ill health.



Photo and interview by Minette Arzadon, 2010

*... 'Separated from my husband 13 years ago, left with 5 children, I am able to cope with the changes in the village by having a small vegetable garden, raising chickens, and fishing when I can. My children have only reached grade 3 – as long as they can read and write, that is good enough... then they have to take on productive work just so we have food. Despite this situation I still participate in village development initiatives... and contributing what small money I can. Thinking of adapting to climate change... we can't do more than just try to survive the day.'*

Tach Heang from the commune of Prey Nup,  
Sihanouk Province - Cambodia

According to the International Food Policy Research Institute (IFPRI), Cambodia remains within 'alarming' levels of hunger. Among the rural poor, the main causes of food insecurity include the lack of access to land, livestock, credit, markets and agricultural inputs – note that climate risks are not highlighted (UN-DAF, 2010). The USDA (2010) notes that key vulnerabilities in the sector are a result of 1) extreme under-funding of agricultural crop extension programs, 2) significantly inadequate funding for scientific agricultural research, 3) extremely low production and availability of improved rice seed, 4) lack of commercial farm credit systems, and 5) poor engineering and system maintenance for irrigation expansion. Given the aforementioned, it is highly probable that for poor rural households dependent on their own limited and irregular food production and their low-paid casual wage labor, their situation will be further challenged by 'climate change' due to a lack of sector reform, and investment in ensuring local participation in planned reforms for 2011.

## Fisheries

Cambodia is highly vulnerable to the effects of climate change on fisheries, which supply livelihoods for millions and up to 80% of all animal protein in the diet. Hydrological variation in the Mekong Basin induced by climate change may amplify an emerging boom-and-bust cycle of fish catches, with banner years followed by years of shortage. Changes in fishery production are likely to have the greatest impact on the people most dependent on fisheries, whose poverty, marginalization and lack of livelihood alternatives leave them ill-equipped to cope. Literature points to fisheries and aquaculture as a sector capable of reducing Cambodia's vulnerability to food insecurity and the effects of poverty, however, often pointed to are uncertainties, e.g. the effects of climate change on fish species composition and abundance are dependent on patterns of fertility, recruitment, nutrition and growth, and also depend on species interactions and changing environmental conditions. Johnston *et al.* (2009) indicates that many freshwater species will thrive in a changed climate, while others may die out. Also noted is that Cambodian fish catches are increasingly made up of species such as *Henicorhynchus* spp. ("trey riel" in Khmer); considered as an unstable source of food and livelihood because their abundance is largely driven by annual flood patterns.

Extreme weather events magnified by climate change could further harm fish production in Cambodia by causing loss of aquaculture stock and destroying fishing and aquaculture infrastructure (Johnston *et al.*, 2009). Noted by the FAO (2009) is that the building of hydropower dams and irrigation structures is often not a win-win scenario, i.e. improved water storage and management can improve water availability in the dry season for agriculture but they can also block fish migrations and reduce fishery productivity – a loss to families dependent on fisheries production for their livelihoods.

From a different view towards vulnerability, the WorldFish Center (2007), has stated that climate change will bring about rising sea levels and increased flooding; render some existing farmland unsuitable for cropping – yet suitable for fish cultivation. Thus, providing for alternative livelihoods and offsetting losses. They also point out that water and nutrients from fishponds can improve farm productivity and sustain the farm under drought conditions. Thus, all the aforementioned only add to the uncertainties emerging in the sector.

### 2.3 Ecosystem services vulnerabilities

Humankind benefits from a multitude of resources and processes that are supplied by natural ecosystems. Collectively, these benefits are known as ecosystem services; grouped into four broad categories: *provisioning*, such as the production/ supply of food and water; *regulating*, such as the control of climate, water temperature, and disease; *supporting*, such as nutrient cycles and crop pollination; and *cultural*, such as spiritual and recreational benefits. As human populations grow, so do the resource demands imposed on ecosystems and the impacts of our global footprint. Natural resources are not invulnerable and infinitely available. The environmental impacts of human actions are becoming more apparent – water quality is increasingly compromised, oceans are being overfished, pests and diseases are extending beyond their historical boundaries, and deforestation is exacerbating flooding downstream. Hence, ecosystem services are not only limited, they are threatened.

Reported by WWF-GMP (2009) and Oxfam (2007), ecosystem services are under a number of stresses related to human development. These 'drivers of change' include trends that fall under the categories of economic development; hydropower, roads, and other infrastructure; mining; agriculture; fishing and aquaculture; human migration and population growth; recreation and tourism; and policy and governance. Climate change is expected to exacerbate these pressures and impact the sustainability of key biological values in the region. According to an Oxfam (2007) report; *"the ability of natural resources to continue to support poor peoples' livelihoods in the Mekong is at a crisis point"*. These reports note that climate change is yet another layer of pressure magnifying the effects of unsustainable development and will profoundly affect the region's biodiversity, water resources, and economy. Literature commonly points to the following as areas of ecosystem services that that will be impacted by climate change in Cambodia:

- Fisheries productivity;
- Nutrient flow/deposition on floodplains;
- Regulation of water levels, water quality, and flood pulse;
- Prevention of saltwater intrusion;
- Water quantity for agricultural production and domestic use; and
- Pollination and other co-dependent services provided by biodiversity.



*... as part of a field based research project on 'drivers of climate change adaptation', preliminary results from UNEP-AIT researchers indicate that changes in land use via dike building has greatly increased the area for rice cultivation, but altered the mangrove forest fisheries production. Villages have expressed ... "our fisheries production is almost gone, dikes to keep out salt water have improved our rice production by 30%, but with changes in water availability, weather extremes, and increases in production costs... we are not sure if we have benefited at all".*

Village consensuses - Prey Nup, and O Oknhaeng Communes,  
Sihanouk Province - Cambodia

Often cited in the literature is the impact climate change will have on fisheries and agricultural production, noting that ecosystems provide regulation of water quality, flow, salinity and temperature; and increasing levels of carbon dioxide in the atmosphere are expected to lead to a gradual acidification of the ocean with negative consequences for marine organisms' life cycles. WWF-GMP (2009) and CDRI (2008) both make references to human activities significantly disrupting important exchanges between river and water systems. Indicated is that disruptions in natural water flows reduce ecological diversity, reduce ecosystem health, and potentially reduce the sustainability of floodplain activities such as irrigated and non-irrigated agriculture. In reference to freshwater ecosystems, climate change is expected to increase wet season flood risk while decreasing dry season water availability. Changes in water flow regulation and patterns combined with warmer temperatures is expected to diminish water quality, shift location and size of species' ranges, affect migration and breeding success, and alter the composition and structure of wetlands and flooded forests.

Also noted in the literature; the loss of coastal ecosystem functions will likely shift species' ranges, abundance, and migration patterns because the landward migration potential of mangrove forests is limited. These factors likely will lead to serious coastal erosion and place further stress on fragile infrastructure. Furthermore, in dry forests, warmer temperatures and altered rainfall patterns are expected to alter fire regimes, change forest types, dry isolated ponds and seasonal wetlands. This will result in altering the availability of fruit resources; in wetter forests, these changes may shift or shrink suitable habitat for rare, threatened, and endemic species because of changes in availability. Hence, climate change not only will put pressure on forest and aquatic ecosystems directly, but also will interact with habitat loss and infrastructure projects that fragment and stress ecosystems further. This will ultimately lead to a decline in ecosystem resilience, and to losses in adaptive capacities for both biodiversity and people to climate change impacts.

## 2.4 Community safety, health and nutrition vulnerabilities

Climate change will greatly impact the health of poor and marginalized groups in Cambodia. Their lack of resources reduces their ability to adapt. In Cambodia, approximately 84% of the population is living in rural areas, many of which live in risk-prone areas – much of which is a result of environmental degradation. Climate-sensitive vulnerabilities include heat-related diseases, vector borne diseases, infectious waterborne diseases, and diseases related to extreme weather conditions such as floods, droughts, windstorms, fires, and heat. For example, poor infrastructure, poor water and environmental management, and high poverty rates make malaria treatment unaffordable for large segments of Cambodia's population. Additionally, it should be noted that only 55% of the population has geographical access to public health facilities (Akachi, Y., D., Goodman, and D., Parker, 2009).

Statistics also indicate that human safety in time of extreme weather is also a concern, e.g. as previously stated floods in 2000 took 347 lives, and in 2001, 62 lives (WHO, 2007). Yet, literature also points to drought as having the largest impact on population health by threatening food supplies and nutrition. In addition, diarrhoeal diseases, scabies, conjunctivitis and trachoma are associated with poor hygiene and may result from inadequate sanitation as water resources become depleted (Prüss *et. al.*, 2008). During droughts, water availability is diminished forcing people to access poorer quality and or degraded water supply sources (Tibbetts J., 2007). This also has strong economic consequences for a country like Cambodia. A WSP (2008) report estimates economic losses due to poor sanitation and hygiene in Cambodia exceeds US\$450 million annually; amounting to some 7% of the GDP in 2005.

Under changing climatic conditions, vector borne diseases, in particular malaria, may become more widespread. With some 800 deaths per year, Cambodia has the highest fatality rate from malaria in Asia. The actual death toll due to malaria may be five to ten times the officially recorded figures. In 2004, a total of 95,558 malaria cases were treated. Incidents of malaria have been on the decline since 1999. However, noted is that under current changing climate conditions, the incidence of malaria might increase in a range of -1% to +16%. Hence, more than 60,000 malaria cases were reported in 2005. Noteworthy, in 2007, reported was the prevalence of dengue fever on the increase. In the first six months of the year, reported were 7,655 cases and 122 deaths, in 2006, 156 deaths (WHO, 2007).

### 3.0 LINKS AMONGST WOMEN, GENDER, AND CLIMATE CHANGE VULNERABILITY

The empowerment of women is a related concept to gender equality. While gender explores the socioeconomic position of women and men in relation to each other, empowerment of women is necessary where women are in a disadvantaged position in comparison to men in terms of their socio-economic status. Indeed, the aim of empowering women is to close or narrow the existing gap between women and men by supporting women in various ways.

In many societies, socio-cultural norms and childcare responsibilities prevent women from seeking refuge or migrating to other places for working when a disaster hits. Osman-Elasha (2009) points out that it is situations like this that increase a women's burden in times of disaster, e.g. needing to travel longer distances to get drinking water and wood for fuel. Literature reviewed indicates that climate change will be an added stressor that will aggravate women's vulnerability; however, the example given seemingly is minor in comparison to common place 'women and gender' issues in Cambodia. Women, in many developing countries suffer gender inequalities with respect to human rights, political and economic status, land ownership, housing conditions, exposure to violence, education and health; most literature reviewed indicates that climate change is posed to exacerbate the effects of such issues... rather than add to the current list.

Poverty is also a driving force behind vulnerabilities to climate change for such limits the poor's ability to adapt appropriately; not mal adapt which is often the case. In times of disasters, e.g. flood, drought and agricultural failure, poor Cambodians often resort to selling assets; parents migrate in search of paid labor leaving children without care; to the more extremes like the trafficking of women and children. Vulnerability levels are high and the ability to cope with shocks is further compounded by household size, composition and underlying social vulnerabilities within the family. These underlying trends include land concentration, and declining access to common property resources such as fishery and forests which have traditionally served as social safety nets for the poor. However, as indicated in this review, the consequences of social and economic stresses are not the same for men and women, and not the same in the face of climate change.

The following discusses the aforementioned in a more specific context to women and gender respective of various climate change vulnerabilities both men and women, and Cambodia face. Subsections are integrated with actual climate change adaptation and adaptation research initiatives occurring in Cambodia – initiatives aimed at helping field-based practitioners understand better dimensions of women, gender, and climate change, and to help the reader contextualize the discourse presented in this literature review. Each subsection is also closed by a brief analysis and identifies areas for further research and analysis.

### 3.1 Women and gender dimensions towards vulnerabilities to natural disasters

*The field of Disaster Risk Management in Cambodia is also crisscrossed by a host of actors. The field appears uncoordinated and external support fragmented; it remains saturated with reports containing good recommendations that wait to be implemented; and interventions that are yet to make sustainable impact.*

*ISDR and WB, 2009*

Reducing vulnerability to disasters is paramount and such is supported systematically through a multitude of Disaster Risk Reduction (DRR) education initiatives within schools. However, few studies indicate if this is an effective approach to reducing a women's vulnerability to climate change. Cannon (2007) stresses that addressing all elements of 'poverty' must go hand in hand with DRR educational initiatives for such to be successful. With education, young women can be empowered to demand better protection from social inequalities, and organize themselves to reduce their 'disaster risks', however, access to DRR education is not within reach for most rural Cambodian women or girls. Cannon (2007) points out that impoverished households will prioritize educational expenses for boys and young men, plus the need for poor households to withhold children from school for labor purposes are key factors in reducing the participation of children (especially girls) from poor families in educational opportunities.

Literature also notes that during extreme weather conditions, women tend to work more to secure household livelihoods and subsistence needs. In a country like Cambodia where drought and flood impacts are cyclical, this commonly leaves women with little time to access training and education, develop skills or earn income; all resources and capacities needed to lessen their vulnerability to natural disasters. This limited mobility, i.e. being tied to the household, places women disproportionately at risk to climate induced natural disasters (Cannon, T., 2007). Reacting to this context, there are recent efforts in Cambodia to reduce climate risks for women near their homes. Currently, the Joint Climate Change Initiative<sup>1</sup> is supporting four (4) small Ecosystem Based Disaster Risk Reduction<sup>2</sup> (EcoDRR) pilot projects throughout Cambodia, aimed at reducing climate risks specific to women; improving local health and nutrition status, reducing livelihood risks through diversification, and integrated approaches to ensuring soil stability through agroforestry. Efforts are tied to the formulation of commune DRR action plans that deeply consider women's needs in times of climate stress proactively; actions are linked to education and empowerment through the building of local organizations and gender focal persons using Rights Based Approaches to promote equitable multi-stakeholder cooperation.

Other DRR efforts that reflect a women and or gender focus can be attributed to organization such as Oxfam Great Britain, e.g. disaster relief for woman headed households in the form of replacing fishing gear and local transports losses associated with their livelihoods. It can be said that many forms of DRR efforts are taking place all over Cambodian, however, literature seemingly refers to 'gender' as a consideration within the DRR training processes, and not a theme or focused topic, i.e. often 'gender' is centered on a women's role to reduce

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<sup>1</sup> Joint Climate Change Initiative: A capacity building programme on climate change implemented by Cord Asia, Dan Church Aid/ Christian Aid, and ForumSyd.

<sup>2</sup> EcoDRR uses the principles of risk reduction from the traditional DRR framework but does not extend into the disaster response side of this framework. EcoDRR focuses on reducing risks associated with climate change through the sustainable improvement and maintenance of ecosystem services – land, water, and rural livelihoods through an encompassing risk reduction strategy. The concept of EcoDRR is currently focused on four components 1) Natural Resource Management, 2) Natural Asset Based Livelihoods, Community Managed Health and Nutrition, and 4) Organizational Development.

the risk of children contracting dengue and malaria, and to a lesser degree on how DRR relates to Human Rights.



Photos by Robert W. Solar, Siem Reap, Cambodia, 2010.

Facilitated through a Cambodian NGO, Banteay Srei; district, commune, and community representatives work together to define a cooperation mechanism to implement Siem Reap's first Ecosystem Based DRR pilot project - a project focused on reducing women's risks to climate change impacts in the Kampong Thkov Commune.

Key Activities 2010-2011:

- Conduct an Eco-DRR baseline assessment with multi-stakeholder participation related to vulnerabilities in sectors of natural resources, agriculture, health and nutrition, and local organizational development; and
- Support Gender Focal Groups, Communes, and the District Council to develop EcoDRR action plans and reduce climate related vulnerabilities through mini-project implementations.



For organizations such as Lutheran World Federation, Cambodia, this is a challenge they have undertaken in 2010. Overall, from the literature reviewed, when considering women, gender, and Disaster Risk Reduction, reflected is that the point of integration between the three (3) is really on women empowerment process, and to a far lesser degree on drought and flood impact mitigation and preparedness technologies akin to women's needs. Additionally, without specifics given, literature points to the heightened impacts of climate induced disasters on women as a result of traditional Cambodian culture respective of productive and reproductive roles – productivity taken precedence over the other; and of the realities noted in section 2.2 of this paper.

There are great efforts being made and improvements on delivering DRR initiatives, but they still have a narrow focus. What is lacking from research and or analysis is the effectiveness of DRR education and how this has translated to climate change resilience on the ground. Also not known is how rural women and men view risk reduction measures, and how this translates to decisions made and actions prioritized in local level DRR actions plans – are they resource driven or driven by traditional patriarchal thinking? Also unclear in the literature is how DRR education and on the ground action plans really reflect gender equality, i.e. beyond manuals, training programs, even gender mainstreaming policies. The aforementioned are just a few question not answered by the literature reviewed, and at times asked within the literature itself.

### 3.2 Women and gender dimensions within the agriculture and fisheries sectors

*'... labor division in rural Cambodia shows that men and women cooperate in agricultural production. Ideals about the division of labor state that men should carry out the more physical work and work which involves greater skill, intelligence or technical knowledge, whereas women carry out the less physically demanding tasks. In practice, the division of labor is quite flexible, but the ideals remain. Women are additionally responsible for domestic work. Once a value is attached to work, the underlying social attitudes towards gender relations become more visible. The work of women is valued less than men's, and this is reflected in rates of exchange and remuneration.'*

Mak, S. (2008)



Cambodian women are the most economically active in Asia and while gender attitudes are changing, significant gender inequalities continue to persist. Cambodia has the lowest levels of gender equity in Asia as measured by the Gender-related Development Index (0.593 in 2009), and a Gender Empowerment Index of 0.377 in 2008, due to poor access to health and education services, productive employment opportunities and land ownership (UN-DAF, 2010, and UNDP, 2010). The same report, and others, point to climate change vulnerability of both the agriculture and fisheries sector and a heightened level of risk for women's livelihoods as they have a significant involvement in post-harvest activities (MAFF and CBNRM LI, 2008). This vulnerability is further heightened for women in agriculture for they are often unpaid family workers with little options for coping with disasters. Even for women headed households active in both subsistence and waged agricultural activities; when 'disaster' hits the sector, prevalent low levels of literacy and education limits their options in the form of livelihood alternatives assessable to them.

The aforementioned are data driven statements combined to conjecture stated within the literature. However, for Cambodia, what is missing from the literature reviewed is an expressed understanding of gender dimensions in both subsistence and wage agriculture and fisheries. Chansothea *et. al.* (2007) states that this would require detailed knowledge of family operations... that which goes beyond statistics that are widely available. For example, household farming operations on one hand generate cash for daily consumption, i.e. subsistence fishers and backyard farmers; on the other hand some activities are spread out over time, i.e. rice and livestock farmers. And in many cases, families are involved in the aforementioned at one time, and other livelihood activities throughout the year. From literature reviewed, often reported is data in the form of segregated numbers; thorough analysis of the interconnections between livelihood activities and dimensions of vulnerability is absent. Absent also is analysis geared towards sector production declines and the impact this has on the post-production activities of paid women workers. Women do have on-farm and off-farm productive roles (some paid, some not), even that between the two sectors throughout a year. Hence, are declines in economic productivity equitable respective of the productive roles for both men and women in times of climate stressed conditions? If so, how, if not, why? Do declines in sector activity come at the same time (agriculture and fisheries) given specific climatic conditions or is it possible that stresses in one sector are offset by favorable conditions in another. This idea has been presented in the literature cited, but no definitive experiences have been well defined. Outlined in very recent research conducted by UNEP-AIT in the village of Otasek, O Otnhaheng Commune, in the District of Prey Noub, Sihanouk Province, it was clear that both agricultural and fisheries sectors can decline at the same time via climatic stresses; exacerbated by poor social and governance contexts.

Noted by researchers, coinciding climate induced conditions of drought, heat, and pest infestations dramatically impacts agricultural production; driving a shift to fisheries and NTFP based livelihoods. Intense extractive activities at these times, without proper resource management in place, actions have decimated the natural resource base. As both men and women headed households are involved in these 'extractive process', clear is that men have fared better due to better access to the resource base itself, physically, and via access to technological assets. For women headed household, access to the resource base is difficult respective of obtaining assets to fish, and time available outside of their reproductive roles to do so – adapting out of necessity, their children are involved in the fisheries at a very young age. Villagers have noted that in the past, moving from one ecosystem to the next worked well for them, until outside interests began to exploit their natural resources illegally. Hence, climate stresses can shift livelihood strategies; however, benefits to be derived are influenced by a multitude of social factors – not just gender differences.

*'... For our family livelihood, both my husband and I are agricultural workers. I work as a paid labor on others farms consistently, while my husband works on our own farm... land which we rent. During harvests, I work on both farms.*

*Despite our difficult financial situation, I still want to ensure that my four (4) children go to school... the oldest is in grade 8 now. I hope my children can gain vocational training in the future... even establish a small business within our community. This is very important because so many of our village children are going outside of the community for work, even the country, with no skills. This worries me because most of the girls end up as prostitutes...'*

Sao Yoeun from the commune of Prey Noub, Sihanouk Province - Cambodia



Photo and interview by Minette Arzadon, 2010

Questions put forth in this section are very basic, but difficult to answer through data assessments currently in use. To gain data that is accurate and useful, assessments need to be done in real time – not after the effect has been noted, and done so consistently. The collection of 'data' should also incorporate the many facets of multiple family coping strategies - assessing where, when, to what degree, and for whom climate change vulnerabilities will occur given chosen economic activities and if possible, correlated with climate stress contexts. Also required to bring usefulness to data is understanding migrating family member movements during crop and fishery failures, i.e. understanding the risks involved and benefits gained by these movements respective of a family's overall vulnerability to food insecurity, poverty, even social exclusion. Ultimately, as agriculture and fisheries carries a significant importance to the rural poor and to the country's well being – we must be able to distinguish between vulnerabilities associated with poor development practices, and those that are climate induced. Yes, sector reforms are needed and addressing climate change should be part of this, but not the only part.

Ultimately, new information could also lead to resources mobilized in an equitable manner to achieve a more gender balance development and empowerment index within the sectors, i.e. moving from coping strategies to well planned climate change adaptation responses. This can be as simple as improving local water and sanitation management, improvements made to the natural resource base, to more complex planning that ensures options and safety nets are in place for rural women prior to extreme stresses.

### 3.3 Women and gender dimensions towards ecosystem services and conservation

Previously stated, literature pointed to the connections between the sustainability of ecosystem services, biodiversity, people, and the further pressure that climate change places on the viability of forest, agricultural, and aquatic ecosystems. Therefore, it is extremely important to have information regarding people's specific relations with the components of ecosystem services... land, water, biodiversity, and human elements. Clear is that different social groups tend to use different natural resources in different ways; but do they possess the needed diversity of knowledge, skills, and relationships to manage these resources effectively?

Where issues of gender equality and equity are concerned, there is the general tendency in the literature to assume that gender is exclusively about women's issues. However, in the context of natural resource management and biodiversity conservation; implied is that gender is about the differences in relationships held by women and men in relation to their

environment, its resources, and the benefits each derives from such relationships, i.e. local natural resource use and management. Without being specific, MAFF-CBNRM LI (2008) community forestry and fisheries case studies express the importance of 'gender mainstreaming' in community forestry and fisheries management – equitable participation in management planning, decision-making, and implementation for men and women have differing demands on and uses for non-timber forest and fisheries products. They also note differences in capabilities with respect to collecting natural resources, i.e. dissimilar opportunities for participation in resource extraction and conservation activities during different times and seasons. For the most part, differences, even inequities, have been contributed to tradition respective of a women's role in the household – both from the point of reproductive and productive roles and stereotypes.

For many women involved in the fisheries sector in Cambodia, participation in the conservation of ecosystem services is exemplified by their interest in savings groups (established through community fisheries projects) and information dissemination on natural resource conservation and protection. MAFF and CBNRM LI (2008) point out that their interest is part of their traditional norms, i.e. being responsible for the household. Interestingly, from six case studies, noted is that women have been more successful than men at convincing those that are harming the environment to give up such activities. Also stated is that women are in need of capacities, those traditionally awarded to men to be able to participate and benefit equally from conservation activities, e.g. understanding natural resource management laws, technology respective of agriculture and fisheries production and post production, and literacy, i.e. indicating a gender imbalance respective of women gaining access to sustainable development efforts and resources, subsequently gaining resilience to climate change equally. MAFF and CBNRM LI (2008) point towards significant 'gender' barriers for the aforementioned to happen:

- Lack of support from husbands and other women in the community to support women's participation in training, gender awareness building, and other livelihood occupations;
- Multitude of reproductive and productive responsibilities (traditional divisions of labor placing more burden on women and on their time); and
- Lack of training venues accessible to women to encourage their participation, e.g. venues that consider child care needs during training.

For the most part, there is a wealth of gender research and analysis respective of community based natural resource management and in the preservation of ecosystem services. As such, women and men do negatively impact the resource base through exploitation, and men and women are playing important roles in turning negative trends around. However, women's involvement is far behind that of men, thus the benefits they derive from ecosystem services and conservation activities is also lacking behind. Reported by Mak, S. (2008) of the Fisheries Action Coalition Team, female-headed



Photo and statement courtesy of FACT, 2010

*The Fisheries Action Coalition Team (FACT) representatives note that for 2009, up to 66.2% of fishing families around the Tonle Sap lake are buying food on credit as a result of falling incomes... "women are at the forefront of this debt"*

fishing household are the poorest of the poor households, and that women are expected to carry the burden of food security for their families.

Looking at the list of barriers listed by MAFF and CBNRM LI (2008), again thinking is around the traditional roles of women and their lack of opportunity to access appropriate development services responsive to their immediate needs, and to improve their position in society as one – this is one of the leading causes of gender equity imbalances in this sector. Hence, one has to ask the question... is it a lack of 'how to knowledge' to bring gender sensitivity into natural resource dependent communities and spur change, change that encourages and supports gender fair participation, or does the barrier sit with those that are tasked to do this? Recent experiences of the author of this paper can note that NGO facilitators, male or female, tend to focus on information derived by male representative when activities are done with mixed groups. These facilitators have noted difficulty in breaking their own stereo types, i.e. the higher the position of the participant (most often a man), the more attention must be given out of respect to ensure community participation as a whole, conversely, household representatives, men and women, tend to let community leaders take center stage in discussions. Hence, barriers are not purely gender orientated, rather socially constructed. This brings about several questions; do development workers have the appropriate mindset, attitude, and processes at hand to engage communities in gender mainstreaming, and what can we expect respective of change in gender equality and equity when people are just trying to survive – their focus, and when change agents are still struggling with facilitating sustainable development processes as a whole?

### 3.4 Women and gender dimensions towards health

Women represent a high percentage of poor communities dependent on local natural resources for their livelihood, particularly in rural areas where they shoulder the major responsibility for household water supply, energy for cooking and heating, and family food security. Gender dimensions of this have been covered in other sections of this review, however, there is still a need to bring forth important dimensions respective of climate change and health, particularly that of water borne diseases and why women tend to be vulnerable. This importance is captured in UNFCCC (2007) reports indicating that climate change threatens to reverse progress in fighting diseases of poverty, e.g. malaria, dengue, even mental health.

Reported by Oxfam (2009), the Cambodian Ministry of Environment has projected significant increases in malaria incidents under changing climatic conditions in the area of 16%. The Ministry contributes projected rises as a result of natural disasters upsetting already fragile ecosystems further. Currently, clear is that natural disasters have coincided with increased reports of contagious diseases such as malaria, and other physical and psychological disorders; but there are discrepancies in the literature respective of dengue fever. The UNFCCC (2007) has stated that so far no connection has been established between climate change and the exceptionally high number of dengue cases being seen in Asia... however, there seems little doubt that rising temperatures and unseasonably high rainfall have a role in this.

Neither of the aforementioned reports have expressed gender dimension to impacts or projections. But, Haigh, C., and B., Vallely (2010) have expressed that there are gender dimensions indirectly that need further investigation, understanding and discourse. Through testimonies, they report incidents of widows and orphans having real difficulty in adapting to climate change for they are weak and easily get ill. Also noted is that during incidents of disaster, food prices rise, and this tends to lead to a reduction in the quality or quantity of the

food rural poor families are able to purchase, with women most likely to make sacrifices. From the ground, Mak, S. (2008) states that ‘women’ often borrow money from informal money lenders to make up for food shortages and to pay for health treatments; paying interests of 10% per month due to a lack of assets to borrow from cheaper formal lending services... in turn purchasing the minimal amount of food as necessary - resulting in physical weakness and falling ill to disease such typhoid, dengue, and fever... again consuming already stressed levels of income – starting the borrowing cycle over.

The resulting poor nutritional status of women also increases their vulnerability to disasters, and makes the physically strenuous tasks of water and fuel collection more difficult. Haigh, C., and B., Vallely (2010) go on to connect ‘food hierarchies’ as a source of protein deficiency for women, and that as climate change may impact fresh water systems and fish populations; this will have a disproportionate effect on women’s nutrition and health. Observations by Osman-Elasha, B., (2009), MAFF-CBNRM LI (2008) and Sun, V., and T., Kouk (2002) take Haigh, C., and B., Vallely (2010) state collectively that the disproportionate impact on women’s nutrition and health can be contributed to their limited access to and control over ecosystem and development services; further stating that women have negligible participation in decision-making and are not involved in the distribution of environmental management benefits. Consequently, women are less able to confront vulnerabilities associated with climate change. Hence, again there is a need to distinguish between vulnerabilities associated with poor sectoral responses to the needs of the rural poor and the causes of women’s vulnerabilities – are they because of climate variability, because of tradition/ cultural barriers, because of gender insensitivities, or how development service agents go about creating awareness, assistance, and feedback amongst the development community for more responsive actions. Hence, needed is analysis into where true barriers are to improving women’s health, i.e. preventing malaria and dengue is not a technical matter. On the other hand, more accessible women centered technologies to home food production are still needed to resolve family based nutrition deficiencies.

### 3.5 Gender and decision-making at household, community and national levels

The National Biodiversity Strategies and Action Plans (NBSAP) report (Sasvari, *et. al.*, 2010) indicates the importance of equitable participation in decision-making, “*Experience has shown that equitable gender representation, involvement and participation of local communities and concerned stakeholders is a prerequisite for successful conservation and sustainable resource use initiatives*”. The report goes on to indicate the importance of women in decision-making processes to ensure the appropriate management of not just household resources, but also community resources to improve conservation approaches towards biodiversity and resilience to climate change. Accordingly, literature often refers to the importance of gender balanced decision-making; and as often, notes that women have negligible capacities to participate in decision-making processes respective of natural resource use (Osman-Elasha, B., 2009). Information distributed through Care (2010) expresses that this inequity in decision-making is deeply rooted in Cambodian society from an early stage; pointing out that adolescent girls are an increasingly marginalized group. Stated is that only 32% have completed grade six, compared to 67% of boys, and that young women are seen as less important due to their lower status within the community.

A CDRI report by Somatra *et. al.*, (2008) discusses theories around participation - its evolution, advantages and loopholes, and some arguments related to the concept and applicability of participation in the Cambodian context – not specifically from the point of gender but the importance of local participation as a whole. Looking at irrigation water governance, this report discusses what it means for people to participate in making use of

water from an irrigation scheme and the main factors behind their decision to do so. The article also discusses people's participation in operational decision making. The report concludes that people's participation in the use of irrigation water is largely driven by economic reasons; how much they are willing to make use of water is determined by how much profit they see in doing so, but their decision to do so is constrained by their limited resources, equipment, finance, and sometimes labour. As for participation in operational decision making, people participate more actively now, but this still has limited influence on operational policy changes as farmers are afraid to act against the majority.

CDRI (2008) contributes the aforementioned discourse to 'participation' as a lack of national development services being responsive to local needs, thus resulting in disproportionate social and environmental impacts. Furthermore, CDRI (2008) goes on to state that unlike large-scale schemes, a small-scale approach is usually more decentralized, and better enables women and men to communicate their needs to local officials and service providers. Noted is that principles of solidarity, without reference to women or gender specifically, encourage decision making at the lowest appropriate level in the planning and implementation of water projects. Sun, V., and T., Kouk (2002) further add to this discourse, but in the context of forestry resource management decision making. Indicated is that women are responsible for 67% of NTFP extractive activities, yet their involvement in local level decision making is negligible. Understood by women are their rights, but not in the context of gender. Traditional attitudes towards women's work, lower education attainment and the lack of peer support – women to women – pose serious barriers to participating in planning, implementation, and decision making process locally.

From the Heinrich Böll Foundation (HBF, 2009), Cambodian women working in NGOs generally are fully familiar with their foreign promoters' gender discourse and that rural women struggle with harsh circumstances. Fundamental to their struggle is the lack of access to education, illiteracy, economic dependency, and hierarchical gender relations founded on traditional role stereotypes. The latter problem contributes to excluding women from active participation in decision making and political processes. HBF (2009) goes on to state that even in those cases where women hold leading roles in local communities or organizations; they are heavily dependent on men in the process of laying claim to their rights. In the climate change context, the selling off of natural resources and the social and ecological consequences of this form of economic development model only caters to the interests of a small political and economic elite... negative impacts are borne especially by women.

Noted throughout this literature review has been the limited space government and society allows women in household and institutional space to influence decisions; often not seen is enthusiasm by government and NGOs to take on women empowerment activities in rural Cambodia – and even less enthusiasm by government to give a voice to NGOs and local level institutions battling for accountability and sustainability. However, there have been some movements forward. The recently established Commune Committees for Women and Children (CCWC), the proposed provincial and district Women's and Children's Consultative Committees (WCCCs) and Commune Committees for Disaster Management (CCDM) have been delegated the responsibility of addressing social and 'climate induced' disaster management issues. However, they are underfunded and lack support from the District level. Hence, the potential of these committees to address gender imbalance in local participation in the planning, budgeting and delivery of development services becomes highly questionable. As a reality, gender representatives at the local level have contented themselves with collecting health and hygiene statistics, working on improvements to sanitary facilities, and to a far lesser degree, building gender sensitivity and equity within their target areas (HBF, 2009).

As women remain greatly under-represented in the executive branches of government (UN DAF, 2010), this only ensures that obtaining gender equity in 'development' and 'climate change responses from the aforementioned councils may prove to be a challenge. Expressed in the literature by HBF (2009) and others, is that the Cambodian government, even NGOs, have simply taken over 'gender' terminology merely as a development policy slogan, empty of any professional or personal confrontation with the related ideas. A wider political understanding is still absent in many cases and further analysis into why this is, is desperately needed. What actually promotes meaningful participation; can/ do incentives devised breach cultural or traditional stereotypes without negative consequences? Two questions that need further thinking and action.

## 4.0 WOMEN AND GENDER: CLIMATE CHANGE KNOWLEDGE, ADAPTATION, AND GOVERNANCE

It is important to see how Cambodian development services are responding to the issues and needs presented in previous sections of this literature review. In this section of the literature review, highlighted are recent, current, and planned climate change adaptation initiatives that give consideration to women and gender issues and to that which elevates the discourse on women and gender in the climate change arena.

### 4.1 Knowledge and analysis

In some way, one might say that there has been and is a wealth of climate change research and analysis happening in Cambodia, and to some extent this research and analysis activity indirectly connects to dimensions of gender, e.g. improving agricultural livelihoods to improving water management and ecosystem conservation. However, research and analysis with direct connections to women, gender, and climate change is far less – but present.

NAPA research has been building upon existing coping strategies implemented by local communities in order to enhance their adaptive capacity. This research work has focused on enhancing understandings related to: 1) the main characteristics of climate hazards in Cambodia (flood, drought, windstorm, high tide, salt water intrusion and malaria), 2) coping mechanisms to climate hazards and climate change at the grassroots level, and 3) existing programs and institutional arrangements for addressing climate hazards and climate change (RGC, 2006). Respective of agriculture, the Australian Centre for International Agricultural Research (ACIAR) has recently implemented a new program of research to assist adaptation to climate change at the farm level; developing capacity for more efficient use of soil and water resources in Takeo, Kampot and Kampong Thom provinces (ACIAR, 2009). The Cambodian Center for Study and Development in Agriculture (CEDAC) is also involved in farm level research focused on small farm holdings. Their research entails looking at carbon storage capacities between traditional methods of rice farming and that of a Systems of Rice Intensification (SRI) approach to rice farming. Indicated by Solar, W., R. (2010), Oxfam America is to be taking a specific focus on further understanding the relationship between SRI and its potential for climate change adaptation and mitigation. Additional studies to be conducted will be the inception of a 'Saving for Change' participatory action research project that links micro-savings to groups vulnerable to climate change – including

women. Hence, although these researches and countless other alike do not specifically state a 'women or gender' focus, what can be learned from them is applicable in this context.

Other example cited by Solar, W., R., (2010) are:

- The Southeast Asia START Regional Center - scientific research on climate change impacts and adaptation strategies in Cambodia with emphasis on agriculture, water, and forest-related impacts and adaptation strategies;
- The Mekong Climate Change Project – focus is on agricultural impacts and adaptation through an assessment of climate change impacts vis-à-vis hydrological regimes in the Mekong using the AQUACROP model developed by FAO. This research is to be integrated with research that studies the impact of climate change on agriculture, fish and food security, and adaptations strategies;
- DRR research of the Economy and Environment Program for Southeast Asia (EEPSEA). The EEPSEA - has produced climate-related hazard maps, human and ecological sensitivity maps, and adaptive capacity mapping in alignment with the vulnerability assessment framework of the United Nations' Inter-governmental Panel on Climate Change (IPCC). Noted is that there is a significant gap in this research respective of community based disaster risk management and health and nutrition in direct relation to climate change adaptation; seemingly processes put forth are taken at face value by practitioners;
- The Cambodia National Capacity Self-Assessment project – an analysis focused on current and proposed response measures to mitigate human induced impacts on biological resources – climate change being one of these; and
- The learning Institute – research agenda for 2010 – 2013 on community fisheries and forestry practices; how the rights, roles, responsibilities, and returns of small scale fishers can be enhance, in particular, those of women.

Like other countries, Cambodia uses a number of assessment models, tools and methodologies as well as various scenarios, including those provided by the IPCC, to help provide an analysis of the future impacts of climate change. In the literature reviewed, climate change impact data is being integrated with socioeconomic data and analyses across a range of sectors. However, it is also reflected that vulnerability assessment models do not perform well in representing human and gender interactions.

The aforementioned gives credence to the difficulty noted in the literature in making gender links to climate change other than reporting statistics and stating traditional 'ways'. In 2004, cited by UNIFEM *et. al.* (2004); their gender analysis work in Cambodia titled 'A Fair Share for Women: Cambodia Gender Assessment' also had difficulty in understanding changing gender relations and issues affecting women. Since then, literature shows that better, more complete attempts at assessing elements of interaction between women and gender are happening, and connecting to climate change. For example:

- Oxfam (2008) has done studies on the impacts of drought on women and men of different age groups; with some confusion. Stated through focus group discussions, 'both men and women believed that men are more affected by drought than women'. This spurred deeper analysis into the roles of men and women within the family structure... noting very different results through the use of segregated data. Yet, Oxfam (2008) noted difficulty in judging the degree of awareness of the importance of gender among local authorities in drought response; and



- In its implementation phase, UNEP and AIT have engaged the Learning Institute and the author of this literature review to conduct research detailing the drivers of climate change adaptation (from local to provincial levels in the coastal provinces of Cambodia) to provide guidance to climate change policy and program development on local, provincial, and national scales. As the research design takes 'gender' and equitable participation as guiding principles to its research framework, it focuses on climate change impacts and the assets both men and women access to adapt their livelihood strategies. Through the use of participatory tools, the research also outlines development services profiles from the commune to provincial levels; identifying capacity gaps respective of addressing climate related hazards as well as social and governance barriers and risks involved in climate change adaptation strategies.

## 4.2 Adaptation: Project and programme interventions

As with much of the research and assessment work relative to climate change in Cambodia deals with non-gender specifics, this is also true for climate change adaptation projects and programme interventions. To begin this component, a brief review of autonomous (also known as coping) and planned adaptation strategies is given followed by specific examples relevant to women, gender and climate change, then more current efforts that directly address issues of women, gender inequality and climate change.

The most commonly cited adaptation strategies noted by Solar, W. R. (2010) were the selection of appropriate crop varieties and the planning of cropping systems, where both men and female farmers grow flowers and vegetables that can fetch a good price at the market, rather than traditional staple food crops such as rice. Storing rice for use during lean seasons seems to be a standard 'safe practice' in communities as a means to cope with shortages in the future. Also noted in the literature is the taking up of animal husbandry practices such as culling, which give villagers a 'buffer' against fluctuations in income from agriculture production during flood and drought periods. Other coping strategies noted is the reduction of water use domestically. Field based research by UNEP-AIT also shows that villagers move from one ecosystem to another where competition amongst people and climate stresses are considerably lower. This has prompted village families to plan their livelihoods strategies careful – breaking away from a sense of collectiveness as in the past, to stay ahead of others doing the same. Results yield two distinct outcomes; for those more mobile, positive results respective of natural resource extraction, negative results respective of village solidarity, negative results in combating poverty, and negative results respective of the sustainability of the natural resource base. Both men and women are equally concerned over these outcomes that could be considered as climate change mal-adaptations.

For planned adaptation strategies, often relied upon are inputs of external actors such as government and non government institutions in the provision of better crop seeds, digging wells, irrigation and dike building, and training on agricultural techniques. Direct examples are pump wells provided by Santi Sena, rice seed provided by the Partnership for Development in Kampuchea (PADEK), water pumps provided by Oxfam, pump wells provided by private companies, and agricultural training and infrastructure support through the United Nations Food and Agriculture Organization and Danida in the coastal provinces.

Local adaptation practices to flooding include the construction of small dikes and canals supported by NGOs and moving animals to roads and higher grounds. Water pumping during drought is also used to irrigate fields located close to the Tonle Sap River, and dikes

have been built to prevent seawater intrusion and to expand agriculture lands in the south of the country. Local authorities have also used resource management tools such as closing fishing areas within lakes seasonally during fish breeding events to ensure stable fish stocks for surrounding agricultural fields; established community forest buffers to provide for additional food security and to prevent soil erosion in surrounding areas. Farmers have also attempted to expand irrigation of dry season rice crops by digging wells reaching 30-40 m into groundwater resources (Solar, W., R., 2010). In several cases these have yielded water for a season only and subsequently lowered the water table - limiting access to others using shallow wells for domestic purposes (MAFF, GEF, and UNDP, 2005). Other failures in adaptation result from the lack of local weather forecasting; shifting rice varieties and planting dates without success. Literature also notes that villagers may be aware of possible coping and adaptation mechanisms such as rehabilitating water storage structures and irrigation canals, building dikes and water control structures, strengthening dwellings against windstorm etc., however, the lack of financial resources has generally prevented local communities from implementing these options.

Looking at specific planned adaptation initiatives relevant to women, gender and climate change is drought management planning, floodplain management and the establishment of early warning systems, more efficient water supply and irrigation technologies, and institutional reforms through Integrated Water Resource Management (IWRM) to sustain water and food supplies. In addition, Integrated Coastal Management (ICM) in coastal areas and ecosystem-based approaches to fisheries is helping to reduce vulnerability to multiple hazards, including saltwater intrusion into water supplies while sustaining fish protein sources (GEF, 2009). These are perplexing initiatives, and times contradictory to perspectives of women shared with UNEP-AIT researchers in the coastal villages, i.e. dikes have limited their access to marine fisheries resources traditionally used to ensure food stability in the family.

In the case of the Cambodian Community Based Disaster Preparedness (CBDP) program, DRR assessments have been followed by micro-projects constructed with local contributions, e.g. small bridges to facilitate evacuations; culverts to help floodwaters recede faster; to dams that facilitate evacuation, but also allow the impounding of water to irrigate a second crop. Van Aalst, M. K., T. Cannon, and I. Burton (2008) report that these efforts resulted in improvements in the social and organizational capacity of villagers. Noteworthy is that the Ministry of Education Youth and Sports has piloted the integration of disaster risk reduction measures into the education sector. This work includes developing and integrating DRR into school curricula. Additionally, as previously mentioned, the Joint Climate Change Initiative is supporting four (4) Ecosystem Based Disaster Risk Reduction (EcoDRR) pilot projects, in addition to two DRR livelihood orientated pilot projects aimed at reducing climate risks specific to women; improving local health and nutrition status, reducing livelihood risks through diversification and resilience building, and by better integrating land use and management technologies. It should be noted that these efforts have just begun at the time of writing, thus climate change adaptation activities have not been defined – only the process to define risk reduction measures that will define supported adaptation actions.

Looking towards livelihoods; MWBP (2005) points to a number of 'climate change' initiatives in Cambodia in areas that broadly support community resilience. In Koh Chrim, the Cambodian Association of America has been supporting communities to conserve fisheries and improve health, hygiene and sanitation. Integrated Pest Management (IPM) and Farmer Field Schools have also been introduced. For CEDAC, they are the hub for Cambodia's involvement in the global network 'Promoting Local Innovation in Agricultural and Natural Resource Management (Prolinnova)'. This network focuses on informational exchanges in farmer to farmer extension (by both women and men) - gender is a core principle to all efforts to be acted upon within the network. CEDAC's current Prolinnova activities focus on

experiments into how to grow vegetables year round considering wind, rain, and water logging.

Also noted in the literature is NAPA with projects allocated to the agricultural sector centered on the promotion of household integrated farming, and the development and improvement of community irrigation systems. With a cross sector focus, aligned are five (5) projects aimed at improving farmers' incomes, food security and livelihoods in areas affected by flood and drought. Partnered to this are Rehabilitation of Coastal Protection Infrastructure projects to increase agricultural production in coastal areas, reduce coastal erosion, and improve the safety of local residences. It is well known that NAPA actions have been slow, however, starting in 2011 NAPA priorities number 2, 3G, and 4B will commence under the guidance of the Cambodian Climate Change Alliance with programme funding support from the Global Environment Facility. The programme will function at the national, provincial and community levels in the four coastal provinces of Cambodia. The programme implements proposes to strengthening national policy, regulatory and institutional coordination for managing climate change adaptation by preparing a vulnerability assessment and adaptation plan for coastal zone adaptation, and by demonstrating coastal flood control measures and ecosystems based resilience measures for livelihood improvement. Although current documents do not make concrete references to addressing the needs of women or to gender equality and equity improvements, intuitively, elements of the aforementioned would be indirectly touch upon; this and from much of the literature cited in this review is often how gender is dealt with respective of climate change adaptation support.

Literature also details out actions of the NGO Development Partnership in Action (DPA), helping communities cope with climate change impacts on their health and livelihoods by assisting communities to adapt their agricultural practices to changing climatic conditions through the introduction of more resilient strains of rice, but also by taking a disaster risk reduction lens to their initiatives, e.g. encouraging communities to develop disaster preparedness and disaster response plans to reduce their vulnerability to disasters such as crop loss (Van Aalst, M. K., T. Cannon, and I. Burton, 2008). Although these efforts do address indirectly women's issues and gender equity is noted in project documents, it is unclear if this has been translated to related impacts on the ground.

The MAFF has taken significant steps in developing and implementing gender components within its work profile alongside international institutions. Some past examples from literature published by UNIFEM *et., al.* (2004) are:

- The National Rice Integrated Pest Management Project: Forty-four percent of the 4,137 farmers trained were women. This high rate of success was due to the scheduling of training at times that were convenient for female farmers, recruiting female trainers, providing gender awareness training to all trainers and making special efforts to encourage women to participate.
- The Agriculture Quality Improvement Project (AusAID): This project developed a gender and development policy and strategies which require that gender be taken into consideration in all phases of the project cycle, and that attention be paid to ensuring that both men and women are involved at all levels in the planning, implementation and evaluation of project activities as well as in decision-making bodies, associations and working groups.
- The Cambodia-Australia Agricultural Extension Project (AusAID): The percentage of female extension workers increased to 18 percent in target districts and special initiatives were introduced to accommodate the low literacy levels of female farmers. Fifteen percent of farmers contacted by extension workers were women; and

- Women in Irrigation, Nutrition and Health Project (FAO): Training was provided to 239 farmers in homestead production (home gardening, cash crop production, livestock raising and water management); 187 of these farmers were women (78 percent); 188 farmers (80 percent women) were trained in Integrated Pest Management (IPM) in vegetable growing and 150 farmers (59 percent women) in IPM in rice cultivation. WIN also facilitated the formation of 10 farmer groups headed by women; 15 farmer water-user communities (5 headed by women); and 16 farmer water-user groups (15 headed by women). Project participants at all levels participated in gender training.

A more recent, and focused example of gender and climate change work is that of Danida implementing an agricultural enhancement project in Siem Reap Province focused on improving women's economic empowerment and community development through increased agricultural production (Danida, 2008). Although there are few examples in the literature related to gender and climate change directly, efforts by ForumSyd, Danish Church Aid/ Christian Aid and Cord Asia, respective of their Joint Climate Change Initiative, are supporting multiple pilot initiatives throughout Cambodia that directly integrate a gender lens into local NGO climate change resilience building responses. Many of the ten (10) pilot projects for 2010-2011 integrate the securing of agricultural and fisheries based livelihoods through the use of an ecosystem management and DRR livelihood framework to build resilience to climate change.

Respective of building climate change resilience in ecosystem services; literature indicates that a multitude of activities are taking place, e.g. improved water management to community based natural resource management approaches, however, most documents have little or no mention of women or gender perspectives, or directed interventions focused on gender issue basis. For the most part, gender responses are loosely blended in with community empowerment activities. For example, the Natural Resource Management and Livelihoods Programme in Cambodia had an objective focus on reducing vulnerability, improving livelihoods and reducing poverty by increasing the 'community voice' in natural resource use and management. The program strategy was driven by the belief that in the longer term, improved natural resource management governance not only reduces vulnerability to climate change impacts, but also leads to more sustained resource use (Danida, 2007).

Reducing vulnerability to climate change also includes a variety of efforts based in the health sector. NAPA's distribution of priority activities in this sector comprises six (6) malaria reduction projects entitled 'Safer Water Supply for Rural Communities' to reduce the risk of contracting water-related diseases. Additionally, local authorities and NGOs such as CONCERN, CRCDC, FAO, UNICEF, WFP, have focused on the development of healthcare centers and posts to assist the Ministry of Health (MoH) in combating malaria in high risk areas that are especially vulnerable to climate change. Providing 'safe water' in high risk malaria regions is being executed by the Ministry of Rural Development (MoRD), and in collaboration with NGOs. The World Health Organization and the MoH have focused on the surveillance of *Anopheles* mosquitoes, improving the education and treatment processes for Village Malaria Workers, and providing bed nets and residual spraying of houses (Mony, K. E., and C. C. Thou (MoE), 2007). Other related initiatives are being undertaken by the Programme d'Appui au Secteur de l'Education Primaire au Cambodge and the Cambodian Red Cross; supporting DRR education, disaster relief, and health sector improvements. Hence, this is an active sector focused on the most vulnerable; intuitively such would have a strong women focus as recipients of assistance. Oxfam GB (2008) also indicates that 'some' government departments have been involved in the distribution of medicines and

other health-related assistance – decision making in these efforts are done in consideration of gender-specific impacts to disasters such as drought.

### 4.3 Climate change and gender mainstreaming policies and empowerment

Prior to the local government elections in 2002, many, but not all villages have a Village Development Committee. These were structurally designed to include three men and two women. Decentralization experiments conducted under the Seila program up until 2001 achieved considerable success in increasing popular participation in governance and in particular increasing women's participation in decision making. Anecdotal evidence from various literatures and the MoWVA suggests that over the first stage of the decentralization process, women's active participation in decision making increased and the choice and design of projects became increasingly responsive to the needs of female constituents. From this point forward, progress for meaningful and equitable participation of women in decision making has been forward but slow.

Building upon policy initiatives, the Asian Development Bank along with the RGC have made strides in mainstreaming gender within the agricultural sector respective of their Agricultural Sector Development Programme with the Cambodia Government (ADB, 2010). The programme has built an institutional framework for gender mainstreaming; outlining the MAFF Gender Policy in Agriculture, operationalized through a three (3) year work plan. This plan was integrated with that of the RGC Agricultural Sector Strategic Development Plan 2006 – 2010. To date, a handbook on Gender Analysis and Planning in Agriculture; in Khmer and English, and a report on frameworks, curriculums and modules for gender mainstreaming have been produced. However, literature does not report any field level impacts to these efforts. This may be attributed to a lag in developing farmer extension service learning materials and services that focus on tasks performed mostly by women. Note that extension service materials developed are used to train members of farmer groups under the ASDP Project, 50% of who are to be women. Still needed is an analysis of the impact this work has had on addressing women, gender, and climate change issues reviewed in the literature review.

Another key policy effort in Cambodia is the Guidelines for Mainstreaming Gender into National Biodiversity Strategies and Action Plans. Guidelines are based on the premises that successful conservation policies cannot neglect the wider socio-economic setting of societies. These guidelines assist the development of National Biodiversity Strategies and Action Plans (NBSAPs) to meet the objectives of biodiversity conservation and simultaneously the promotion of gender equality. They provide general guidance to Parties on the inclusion of gender considerations into their existing and forthcoming NBSAPs (Sasvari, A., Aguilar, L., Khan, M., Schmitt, F., 2010).

Thiel, F., (2010) has highlighted the work of the German Development Cooperation as 'progress' for meaningful and equitable participation of women in decision making. A recent undertaking is the development of a Priority Strategy Paper for Rural Development underlining the following impacts:

- The living conditions of the poor rural population of Cambodia, especially for women, have been sustainably improved;
- The poor rural population, in particular women, makes use of the improved infrastructure and the extended scope for action to participate to a greater extent in sustainable economic development; and

- The socially-balanced, gender-equitable and secure access to land is improved in rural as well as in urban areas, as is the well-ordered utilization of land.

As previously mentioned, recently established Commune Committees for Women and Children (CCWC), the proposed provincial and district Women’s and Children’s Consultative Committees (WCCCs) and Commune Committees for Disaster Management (CCDM) have now been delegated the responsibility of addressing social and ‘climate induced’ disaster management issues. It is hope that once these initiatives are streamlined they will open up more space for women and gender balanced discourse over the needs of the rural poor.

Lastly, associated with much of the literature has been the importance ‘land’ is to women and their empowerment. Thiel, F., (2010) and others have pointed out that gender equality is guaranteed in the Cambodian Constitution, which prohibits all forms of discriminations against women (Article 45). Both men and women should have equal opportunity to exercise their civil, political, economic, social and cultural rights. Under the current Land Administration Sub Sector Program, 1.6 million parcels have been registered as of 2009 with an equivalent of 1 million land titles. Statistic show that female owners outnumbered male owners for 20 % of the land titling was made in the wife’s name, 5 % in the husband’s name alone, and 70 % consist of joint ownership titles. As significant of an achievement this is in policy implementation and empowerment, field surveys also brought evidence about the lack of security in ‘joint titles’ in the event of separation, divorce, abandonment, and multiple marriage relationships. Also pointed out were that approximately 9.5 million parcels of land remain unregistered which means an ongoing land registration process for approximately another 30 years.

In closing this section, one of the general principles put forth is that climate change is about people and peoples’ livelihoods; how they perceive their security and how policies and development services need to build appropriate capacities on the ground. Special efforts are required to include women in the climate change adaptation process – improving gender equality and equity, and good governance must be a cross-cutting theme to all actions.

## 5.0 CONTEXTUALIZING WOMEN AND GENDER WITHIN CAMBODIA’S CLIMATE CHANGE VULNERABILITIES: KNOWLEDGE, ACTIONS, AND FORWARD NEEDS

### 5.1 Contextualizing women and gender within Cambodia’s climate change vulnerabilities

This literature review has tried to contextualize and ascertain the level of understanding and actions of stakeholders respective of women, gender, and climate change in Cambodia. Beginning with a regional perspective of the discourse, clear is that Cambodia’s challenges in dealing with climate change are not unique, and that overcoming these challenges will highly depend on how sustainable development in the country will be expressed, and how effective gender mainstreaming initiatives can address social stereotypes – from discourse to actions in the coming years.

To begin this section it is important to establish a simple base-line scenario of Cambodia’s climate change vulnerabilities to contextualize this section of the review.

## Cambodia's vulnerability context:

*Cambodia's rural poor are disproportionately dependent on public goods for their livelihoods, so declining quality of, or access to, natural resources negatively affects the poor. The poor are more vulnerable to external shocks due to a limited asset base, livelihood opportunities and little access to decision-making, and have less ability to adapt to environmental changes such as climate change. The poorest households seem to be the most vulnerable due to their weaker asset base and narrow livelihood opportunities.*

The literature has consistently pointed to gender influences as to who will be most affected by climate change effects, and has differentiated the types of adaptation strategies of women and men respective of constraints to resource access, allocation, and society. Danida (2008) has pointed out that Cambodia's climate change impacts are not isolated or possible to separate from other conditionality of development and poverty reduction. Hence, the existing causes of poverty and constraints to equitable development take center stage in the discourse, e.g. resource inequality, gender inequality, and poor governance.

Literature reviewed has pointed to climate change as a human security and gender issue since it affects women and men in different ways by exacerbating their existing economic, political, livelihood, and resource vulnerabilities. These differences have amounted to gender inequalities; and stark differences respective of a women's capacity to adapt to climate change – being far less. Consistent with literature reviewed, Resurreccion, B., (2009) has put forth a list of gender related insecurities relevant to Cambodia's current and future climate change scenario:

- The specific needs of women may be over looked because they are less involved in decision-making with regards to improving infrastructure;
- A tendency to place increased burdens on women due to shifts in the gender divisions of labor, cropping choices, patterns and schedules;
- Women being traditionally tasked to transact loans and repayments, thus increased dependence on loans place new pressures on them;
- Access to income generating opportunities depends on time, skills and networks: women and men may vary on these; and
- Increased mobility of men for alternative income sources, and women are left behind to manage domestic and agricultural activities.

Literature reviewed also indicated gender mainstreaming policy and governance movements reaching across changes to, and additions to, local governance mechanisms, to capacity and policy enhancements across Ministries. However, these efforts have not been evaluated as to their impacts on the ground. But, nonetheless, 'climate change' activities on the ground are happening... yet it is still unclear if these efforts will really meet the needs of the rural poor in a gender fair way. As mentioned by HBF (2009), one of the fundamental challenges to obtaining gender fairness is addressing hierarchical gender relations founded on traditional role stereotypes. For some organizations in Cambodia 'gender mainstreaming' is happening; especially in the agriculture, fisheries, and natural resource management sectors – but few efforts show modality towards addressing traditional gender stereotypes. If one looks closely at the list of climate change gender insecurities given, each is directly related to traditional gender roles. For Cambodia, two key sets of vulnerabilities must be challenged at the same time – those attributed to climate change and those attributed to inequities in society, i.e. the meaningful integration of gender in climate change adaptation responses.

## 5.2 Women, gender, and climate change knowledge and forward needs

As pointed to in this review, Disaster Risk Reduction (DRR) knowledge needs to be built in areas of evaluation, e.g. knowing the effectiveness of rural DRR education and that of implementation of locally formed risk reduction action plans. By doing so it may help in understanding how rural women and men view risk reduction measures and on how decisions are made and actions prioritized. This knowledge is critical for the development and improvement of policy and legislation to address localized challenges posed by climate change and disaster risks in an integrated manner - and through a gender lens. To get this knowledge, needed is meaningful gender-equal participation in decision-making bodies at all levels to get supporting policy and legislation right. Also needed is the building of local and provincial capacity in monitoring and evaluating the impact of policies and governmental programs, and that of local level decision-making – including terms of gender equity and how this is understood and expressed. However, it must be noted that knowledge gathered, to analysis, such is often influenced by the predisposition of the ‘researcher’ themselves molded their own expressions of gender stereotypes. Thus, it is important to continue gender mainstreaming efforts, but to also find ways to pilot and reflect on these efforts and their results at the field level before launching broad based altruistic gender mainstreaming efforts. It is better to have doable changes rather than changes on paper; perhaps in smaller increments to enable a better understanding of the societal risks involved in challenging cultural norms.

When thinking of the agricultural and fisheries sector, data production is abundant – simply put we know what goes up, and what goes down, but ultimately, we must be able to distinguish between up and down as a cause of the form of development employed, or as a result of climate change. We also need to be clearer about climate change adaptation strategies - are coping strategies effective and equitable at the family level? Known is that women do carry further burdens when things are ‘down’, and this burden can be increase through mal-adaptation strategies - attributed to themselves or by others. For example, when women are forced to access credit (as part of their traditional roles), or out of need for female headed households; relations in their households, community, and market tends to weaken their use of the loans, and or exacerbates their impoverished situation – often resulting in further problems.

Much work is still to be done on understanding the risks involved and benefits gained from livelihood mobility, credit schemes, and shifting livelihoods as coping and planned adaptation strategies. For example: there is a need to lower a ‘woman’s’ risk when a family seeks to diversifying their livelihoods through short and long term migration strategies - especially in places where women are the ones the move. However, to do so effectively we need to understand more about who is migrating, where, and what new hazards they are being exposed to – and what new vulnerabilities are created for those left behind. Additionally, we must improve our understanding of the assets necessary to enable migration, particularly of the poorest groups who may lack needed financial capital, skills, knowledge and capacities to do so safely.

As forward needs respective of livelihood resilience for subsistence and small-scale fisher folk and farmers – needed is to understand who has better access to enabling climate change adaptation mechanisms, and whose voices are least heard. There is also a need to explore and further develop win-win scenarios (climate change mitigation and adaptation) for rural people – including women – who rely on natural resource for their livelihoods, e.g. Ecosystem based Disaster Risk Reduction.



When thinking of ecosystem services, knowledge around use and impact is abundant; most built from years of community based natural resource management initiatives. Yes there are still gaps in broader themes around the accuracy of related vulnerability assessment, e.g. impacts of climate change on hydrological regimens and the variability of such on local livelihoods... but the fundamentals are sound. What is lacking in our understanding is how to approach development and gender sensitivity awareness building in the sector to bring about change, change that encourages and supports gender fair participation and equitable benefit sharing without negative consequences. This requires that initial focuses must be on women – building their capacity to engage and participate from an empowered position; and a focus on sensitizing others to the benefits of women being empowered – a non threatening position of empowerment.

Respective of the health sector; understood is how climate change can exacerbate the current impacts of poverty on women's health – although these are only generalities and loosely correlated to climate change - more so towards being impoverished and marginalized. Oxfam (2008) has identified the following knowledge gaps:

- Identification of direct and indirect impacts of climate change on human health on different gender and social groups; and
- Identification of barriers to successful health-related autonomous and planned adaptation to climate change stressors.

Forward needs to improve health resilience to climate change for the rural poor – especially women, requires the building of capacities in areas of surveillance and the ability to anticipate and address changing disease vectors locally. This would entail the building of pathways for rural women and men to strengthen their participation in health related activities, and their claim making abilities for better health systems. From a broader view; instituting social, technological, institutional, and policy measures to improve participation, responsiveness and collective ownership over gender inequities in Cambodia's health sector is a must.

Empowerment of the poor – men and women participating in equitable and meaningful decision-making processes has been mentioned in all segments of this literature review and of that cited. Clearly, local participation is needed to build a nation's resilience toward climate change impacts and to address the many gender and societal inequalities. To bring the 'how' to this 'need' to the agenda of institutions and organizations, research on the driving forces behind climate change adaptation strategies must be expanded beyond the pilot testing of a methodology amongst a few coastal communities. Additionally, research of scale is needed to build consensus on and action towards addressing the underlining mechanisms of social and gender exclusion and the impacts of such on building climate change adaptation capacities.

It should be stated that to build climate change adaptation capacities, efforts must be rooted in field-based contexts, i.e. community and governance capacity building based on addressing local hazards. This is NOT to say that attention is not needed at intermediate and national levels of governance, for it is at these levels where climate change risks to women can be addressed via greater scales of support. Yet, literature points to these levels of governance where the 'gender gap' respective of participation widens. As a connected forward need, climate change adaptation planning needs to become holistic – that considering both women and men's autonomous adaptation strategies and cross-community, cross sectoral planned adaptation strategies. This cannot happen if both women and men cannot effectively take up leadership roles at the intermediate level of governance. Hence, it is important that we build our knowledge to gain a wider political understanding of what actually promotes/ or allows for meaningful participation.

### 5.3 Concluding statements, recommendations and starting points

Putting this literature review together was a challenge for few documents really expressed detail knowledge of women, gender, and climate change. In some cases, documents on country vulnerability studies and climate change adaptation gave no reference to the words 'women' and or 'gender'. Collectively, all cited literatures were valuable in presenting a true picture of women, gender and climate change in Cambodia. However, There is a need to distinguish between vulnerabilities associated with poor sectoral responses to the needs of the rural poor and the causes of women's vulnerabilities and gender inequities – are they because of climate variability, because of tradition, cultural, or social stereotypes, because of gender insensitivities... or something else?

#### Statements

The following are key women, gender, and climate changes issues highlighted in this review:

- Disproportionate access to financial resources, land, natural resources, education, health, rights, and development services;
- Lack of capacity (knowledge, assets, and access to development services) to capture opportunities to diversify agricultural practices and lessen dependencies on climate sensitive and stressed natural resources amongst the extreme poor;
- A marked skew in economic development – that which puts emphasis on creating opportunity at the expense of the disempowered – a result of governance being selectively implemented on the ground;
- Poor and often inequitable sustainable development practices and an absence of sectoral reforms to create specific safety nets for women in times of climate stresses;
- Barriers to climate change adaptation and meaningful participation in decision making processes because of social stereotypes/ traditional norms;
- Barriers to meaningful gender mainstreaming because of social stereotypes active within the development community itself – Minds, Attitudes, and Processes (MAP) employed; and
- Sever knowledge and process gaps respective of understanding climate change as an impact on sustainable development, and gaps in the use of knowledge to inform initiatives aimed to address climate change vulnerabilities.

To address these issues effectively, noted are the following knowledge and analysis needs:

- Knowledge of how social networks and informal institutions operate to facilitate gender fair climate change adaptation;
- Knowledge on alternative micro-finance mechanisms, formal and informal, and how such could work with multiple livelihood and asset portfolios respective of multiple local livelihood strategies;
- Knowledge of barriers to successful health-related autonomous and planned adaptation to climate change stressors;
- Analysis of the interconnections between natural resource based livelihood activities and dimensions of vulnerability – including gender responsiveness and ecosystem sustainability;
- Analysis of sector production declines vis-à-vis land use changes and the impact this has on the production and post-production activities of paid and unpaid women workers;

- Analysis on the effectiveness of informal and formal credit and saving institutions; what have been the consequences of such on gender relations to how credit can be tied effectively to building community resilience; and
- Analysis on the effectiveness of gender mainstreaming within government institutions and non-government organizations – respective of policies, modes of implementation, and barriers to positive impact at the field level.

## Recommendations and starting points

Literature has not alluded to concrete steps as to how to address the aforementioned knowledge and analysis needs, and in many ways capacities will have to be built to garner knowledge, and to put such knowledge to use. As a starting forward action, perhaps institutions and organizations would need to review their gender mainstreaming initiatives, and reflect on these vis-à-vis dimensions of practicality and social and economic risks... then focus on reducing identified risks to gender mainstreaming. By doing so, the many barriers to successful climate change adaptation for women mentioned could be revealed, lending to plausible actions that empower women without negative consequences.

Among the various research institutions cited in this literature review, identified is the need to strengthen links between mainstream climate change adaptation practices with ecosystem sustainability, health and nutrition, and livelihood strategies across sectors. Yet, literature has shown there to be significant knowledge gaps in understanding autonomous strategies at individual and household levels, and of the underlying systems that may assist or directly enable adaptive capacity to be built. To do so we need to fully understand what drives autonomous adaptation, and how these strategies can be supported to move from a coping strategy to an effective gender responsive planned adaptation strategy. Moreover, we need to understand the risks involved in taking on social stereotypes in the arena of community development and environmental management – where sensitivities to change may be challenged; and find innovative ways of mitigating these risks.

If we aim to build climate change resilience through the development of adaptive capacities at the grassroots level, areas of risk and vulnerabilities respective of the processes we employ must be known and mitigated. Subsequently, often it is easy to come up with good solutions to a given problem – sometimes they are altruistic in nature, but often they lack practicality – in part because of available resources at hand... and in part how other sectors of society react when they see that ‘solutions’ will not benefit them equitably – be it economic to dimensions of empowerment to reductions in climate change risks. Moving past this will require Cambodia to make use of participatory multi-stakeholder process more effectively, e.g. adopting participatory planning and consultation processes openly, conducting participatory research consistently – from design to implementation, to taking more of a multi-stakeholder approach to policy development. Notably, these are basic processes involved in sustainable development, processed used by others to meet their Millennium Development Goals and importantly, processes exemplified in the International Bill of Human Rights – the right to participate.

Climate change does have distinctive gender dimension in the sense that women and children are more exposed to its consequences, and that they have less influence over decisions related to climate change adaptation. The literature does not debate this, as it does not debate the need to push beyond gender mainstreaming and begin to address social stereotypes more aggressively for it is very plausible that this is one of the more prominent root problem causes of women’s vulnerability to climate change impacts. Needed are scaled efforts to improve women’s access to land, control of credit, agricultural inputs, and useable technologies. We must also institute social, technological, institutional and policy measures to overcome barriers hindering full participation in climate change discourse

and processes of adaptation by all stakeholders – women included. If we want to understand and act towards the many issues basis stated in this literature review, the later seems to be the most appropriate place to begin. However, this will first require marked adjustments to how development practitioners approach ‘community empowerment’, how government approaches equality and equity, and how Cambodians themselves openly express their own empowerment.

End

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## Annex 2 Bibliography of key referenced materials

ADB, 2010. *Gender and Development Report on Agricultural Sector Development Programme*. Asian Development Bank. Retrieved on 18 October 2010 from <http://www.adb.org/gender/practices/agriculture/cam003.asp>

An ADB on-line report discussing the expected inputs, impacts, and targets of gender mainstreaming efforts with the Ministry of Agriculture, Forestry, and Fisheries under the *Agricultural Sector Development Programme loan*. The report also discusses up-to-date achievements in categories of 1) gender-inclusive design, 2) gender policy implementation respective of extension support to farmer groups, support services for agro-based enterprises, institutional strengthening for agricultural commercialization, and project management, and 3) project implementation. Also provided is a synopsis of lessons learned.

Danida, 2008. *Climate change screening of Danish development cooperation with Cambodia*. Ministry of Foreign Affairs of Denmark Danish International Development Assistance (Danida). 104.DAN.4-52-9-2.

A climate change screening of the Danish development cooperation with Cambodia was carried out from May 19 to 26, 2008, for the Danida Representation in Phnom Penh in collaboration with the Cambodia Climate Change Office (CCCO) of the Ministry of Environment (MoE). The climate change screening includes proposed recommendations for the Danida Representation to provide support to the efforts to address adaptation to climate change. Additional funding can be made available by Denmark to fund the implementation of proposed recommendations in addition to funds already available in the development programmes. Recommendations and follow-ups are given to develop close collaboration with development partners including the Cambodia Climate Change Office and other donors in the concerned sectors. The climate change screening is integrated where relevant with the Danida action plan on Disaster Risk Reduction.

Haigh, C., and B., Valley, 2010. *Gender and the Climate Change Agenda: The impacts of climate change on women and public policy*. Women's Environmental Network © 2010 20 Club Row, London.

This report by Women's Environmental Network examines the distinct impacts of climate change on women in both developed and developing countries, women's contribution to climate change, and their involvement in decision making about tackling climate change. The report gives specific findings respective of the likelihood of living in poverty and their gendered social roles. The report also summarizes the impacts of climate change on women respective of existing gender inequality. Key findings state that on average, women tend to contribute less to climate change because of their poverty - lower consumption roughly equates with lower greenhouse gas emissions - and their social roles. Finally, the report considers women's involvement in decision-making about climate change.

The report concludes that remedial action is required on three fronts, 1) gender-sensitive strategies to mitigate climate change – the more radical the cuts in emissions in the next few years, the better chance there is of limiting the negative effects of climate change on women, 2) addressing gender inequality – until gender inequality is addressed, women will continue to suffer climate injustice, and 3) gender-sensitive strategies for adapting to climate change are vital and should take account of women's considerations. Other strategies suggested include a gender audit of stakeholders, and inclusive mainstreaming policies and resources for women-centered solutions.

MAFF and CBNRM LI, 2008. *Gender Implication in CBNRM: The roles, needs, and aspirations of women in community fisheries*. Fisheries Administration of the Ministry of Agriculture, Forestry and Fisheries (MAFF), and the Community based Natural Resource Management Learning Institute (CBNRM LI). Cambodia.

This is a research document in book form that looks deeply into six case studies respective of the gender implications on community based natural resource management approaches. The research builds on former work related to the roles, needs, and aspirations of women in community fisheries in Cambodia. Outlined in the document are a 1) description and analysis of the roles of women and men in fisheries related livelihood activities and community

fisheries, and in the associated decision-making at the household and community level. The book also identifies the needs and the aspirations of women associated with community fisheries. Provided are recommendation – strategies and opportunities – for increasing women’s participation in community fisheries planning and implementation.

Mony, K. E., and C. C. Thou, 2007. *Health Impacts of Climate Variability and Change in Cambodia*. Presented at the Workshop on Climate Change and Health in South-East and East Asian Countries Kuala Lumpur, Malaysia. Retrieved on 18 October 2010 from <http://www.wpro.who.int/NR/rdonlyres/6BE01257-DA1C-45A4-9886-EE79F75F90FE/0/CCpptCambodia.pdf>

This workshop presentation gives data on health related impacts as a result of climate change. Outlined are the “current burdens of climate-sensitive health outcomes” indicating that the impacts of climate change on health are likely to have an unequal impact on the poor and marginalized groups because of their limited access to resources which in turn limit their ability to adapt. The presentation also connects health related impacts to issues of poverty, geography and the country’s infrastructure as the main causes of health related vulnerabilities – particularly malaria. Furthermore, the presentation highlights data and research needs on the impacts of climate variability respective of malaria and dengue fever; research on water born diseases related to climate change and addressing measures, and the need for adequate seasonal forecasting to improve public awareness and responding actions. Noted is that health sector institutions are cannot deal with climate change impacts nor the building of adaptive capacities alone, that an integrated response from various sectors is the only answer.

Osman-Elasha, B., 2009. *Women In The Shadow of Climate Change*. UN Chronicle. Retrieved on 18 October 2010 from [http://www.un.org/wcm/content/site/chronicle/cache/bypass/home/archive/Issues2009/pid/5080?ctnscroll\\_articleContainerList=1\\_0&ctnlistpagination\\_articleContainerList=true](http://www.un.org/wcm/content/site/chronicle/cache/bypass/home/archive/Issues2009/pid/5080?ctnscroll_articleContainerList=1_0&ctnlistpagination_articleContainerList=true)

This is an important article that outlines climate change challenges based on the findings of the Intergovernmental Panel on Climate Change (IPCC). In brief, the article discusses why women are more vulnerable to climate change, and offers recommendations to improving women’s adaptation to climate change. Recommendations focus on adaptation initiatives identifying and addressing gender-specific impacts of climate change particularly in areas related to water, food security, agriculture, energy, health, disaster management, and conflict. Important gender issues associated with climate change adaptation, such as inequalities in access to resources, including credit, extension and training services, information and technology should also be taken into consideration. Furthermore, the article suggest that women’s priorities and needs must be reflected in development planning and funding and that women should be part of the decision making at national and local levels regarding allocation of resources for climate change initiatives.

Oxfam GB, 2008. *Drought Management Considerations for Climate Change Adaptation: Focus on the Mekong Region*. Cambodia - Oxfam Cambodia and Graduate School of Global Environmental Studies of Kyoto University, Japan.

The study was commissioned by Oxfam Cambodia. The aim of the study was to understand factors contributing to climate vulnerability and to improve resilience mechanisms in some of the most climate risk-prone areas in Svay Rieng province, Cambodia. The study was regarded as a pilot initiative, with the aim of understanding various issues related to climate change and drought risk reduction, so that areas of focus for intervention in climate risk-prone areas can be identified and implemented with a long-term perspective. With specific objectives, the study assesses the climate vulnerability of rural communities in the most drought-prone areas of Svay Rieng province, and to determine their perceptions of how climate risk shapes their vulnerabilities. The study also identifies possible adaptation measures to mitigate the impacts of ever increasing climate variability and change on rural communities, in particular the effects of drought, with an emphasis on identifying impacts on a gender-disaggregated basis.

Resurreccion, B., 2009. Presentation: *Gender, Human Security and Climate Change Adaptation in Southeast Asia - The Challenges for Gender-responsive Adaptive Strategies*. Gender and Development Studies, School of Environment, Resources & Development, Asian Institute of Technology, Thailand.

This is a presentation as part of the Center for Non-traditional Securities Studies conference on Climate Insecurities, Human Security and Social Resilience held in Singapore, August, 2009. All presentations can be retrieved from [http://www.rsis.edu.sg/nts/Events/Climate\\_Change\\_Conf.html](http://www.rsis.edu.sg/nts/Events/Climate_Change_Conf.html). This particular presentation outlines climate change in Southeast Asia: respective of general characteristics, places of vulnerability and peoples vulnerabilities. The presentation links climate change as a human security and gender issues respective of 1) the role of gender in climate change adaptation, 2) effects of climate change – gender influences and who will be most affected by climate change, 3) adaptation strategies – differentiating the types of adaptation strategies of women and men, and 4) the efficiency of strategies - what enables or constrains the adaptation strategies of people.

RGC, 2006. *National Adaptation programme of Action to Climate Change (NAPA)*. Royal Government of Cambodia, Ministry of Environment, Phnom Penh, Cambodia.

This document reviews the national circumstance of Cambodia in reference to climate change vulnerabilities and efforts needed to adapt to varying climatic threats. Put forward is a framework for an adaptation programme that links national socio-economic development objectives with that of climate change adaptation priorities. Identified within are key adaptation needs respective of policy and on the ground strategies and initiatives. A criteria for selecting priority activities is given along with a sector focused list of projects – from health, water, natural resource management, to infrastructure. The document is to be used as a basis of funding allocations from international institutions to build Cambodia's resilience to climate change impacts.

Sasvari, A., Aguilar, L., Khan, M., Schmitt, F., 2010. *Guidelines for Mainstreaming Gender into National Biodiversity Strategies and Action Plans*. Gland, Switzerland: IUCN. viii + 97pp

This comprehensive document and subsequent *Guidelines are to assist in the development of National Biodiversity Strategies and Action Plans (NBSAPs) for Cambodia to meet the objectives of biodiversity conservation and simultaneously the promotion of gender equality*. They provide general guidance to Parties on the inclusion of gender considerations into their existing and forthcoming NBSAPs. The *Guidelines* build on the experience of the 166 NBSAPs submitted to the Secretariat of the Convention on Biological Diversity up to July 2008. The *Guidelines* are in two modules. Module 1 "Linking Conservation of Biological Diversity and Gender Equality" explains the purpose and goals of the *Guidelines*, the background of their development, the international framework they fit in, how gender and biological diversity are mutually enhancing goals creating a win-win situation, gender issues relevant for conservation, the added value of gender mainstreaming into national conservation policies and the importance of gender mainstreaming into NBSAPs. Module 2 "Mainstreaming Gender into National Biodiversity Strategies and Action Plans – Process and Content" provides practical step-by-step guidance; first, about the incorporation of a gender equality perspective into the NBSAP development process; second, about making gender equality visible, in a systematic and coherent way, in the text of both national strategies and action plans.

Somatra K., Phalla C., Daravy K., and Vanny S. (2008) *Defining Participation in Irrigation Development and Management*, Annual Development Review 2007-08

This article is part of an Annual Development Review and discusses theories around participation - its evolution, advantages and loopholes, and presents arguments related to the concept and applicability of participation" in the Cambodian context. Focused on irrigation water governance, this article discusses what it means for people to participate in making use of water from irrigation schemes and the main factors behind their decision to do so. The article also discusses people's participation in operational decision making. The article concludes that people's participation in the use of irrigation water is largely driven by economic reasons; how much they are willing to make use of water is determined by how much profit they see in doing so, but their decision to do so is constrained by their limited resources, equipment, finance and sometimes labour. As for participation in operational

decision making, people participate more actively now, but this still has limited influence on operational policy changes as farmers are afraid to act against the majority.

Solar, W. R. (2010). *Scoping Study of Climate Change in Cambodia, Regional Climate Change Adaptation Platform for Asia (Adaptation Knowledge Platform)*. Copyright © AIT-UNEP RRC.AP 2010, Bangkok, Thailand

Commissioned for the Regional Climate Change Adaptation Knowledge Platform, the scoping study give a comprehensive view of climate change adaptation in Cambodia – from knowledge, systems, and structures, to policy related initiatives in the country. The study brought together years of literature, research, and directly, perspectives of key climate change stakeholders in the country. Through consultation and workshop efforts, put forth are recommendation areas of action in the form of a capacity development strategy for Cambodia. The study has four main components, 1) Institutional responses to climate change adaptation, 2) In-country adaptation actions: knowledge, systems and structures, 3) Climate change knowledge, research and needed actions, and 4) A capacity development strategy that defines capacity gaps and priorities, a strategy for adaptive capacity development, and the development of a climate change adaptation platform for Cambodia.

Note that the study is part of a wider regional effort through the Stockholm Environment Institute (SEI), the Swedish Environment Secretariat for Asia (SENSA), the United Nations Environment Program (UNEP), and the Asian Institute of Technology (ATI) Regional Resource Centre for Asia and the Pacific (RRCAP), and others to help advise countries in Asia as to their state of climate change resilience, and to encourage joint learning from in-country efforts.

UN-DAF, 2010. *United Nations Development Assistance Framework 2011-2015*. United Nations in Cambodia, Cambodia.

The document has been devised based on an analysis of a 'Common Country Assessment'. This 2011-2015 UNDAF provides a framework for coordinated UN development assistance in keeping with the UN reform process and the commitments laid out in the Paris Declaration on Aid Effectiveness (reaffirmed in the 2008 Accra Agenda for Action). The UNDAF is anchored in and aligned with the Cambodian Government's Rectangular Strategy Phase II and the National Strategic Development Plan (now extended to 2013). It builds on the achievements and progress made over the last decade and leverages the UN's position as a trusted and neutral partner of the Royal Government of Cambodia and the people of Cambodia. The process of building the document adopted a Human Rights-based Approach to the country analysis to advocate for priorities in the National Development framework. This key principle is shown to require a specific focus on the marginalized, the disadvantaged and the excluded, and form one of the core programming principles of the UNDAF – gender fairness. Provided are five (5) priorities that will form the core of the UN's support to Cambodia between 2011 and 2015. The content of the document covers Cambodia's development context, UNDAF research results, resource requirements for implementation, implementation arrangements and the monitoring and evaluation of initiative to be undertaken.

Van Aalst, M. K., T. Cannon, and I. Burton, 2008. *Community level adaptation to climate change: The potential role of participatory community risk assessment*. *Global Environmental Change* 18 (2008) 165–179.

This paper explores the value of using community risk assessments (CRAs) for climate change adaptation. CRA refers to participatory methods to assess hazards, vulnerabilities and capacities in support of community-based disaster risk reduction, used by many NGOs, community-based organizations, and the Red Cross/Red Crescent. We review the evolution of climate change adaptation and community-based disaster risk reduction, and highlight the challenges of integrating global climate change into a bottom-up and place-based approach. Our analysis of CRAs carried out by various national Red Cross societies shows that CRAs can help address those challenges by fostering community engagement in climate risk reduction, particularly given that many strategies to deal with current climate risks also help to reduce vulnerability to climate change. Climate change can also be explicitly incorporated in CRAs by making better use of CRA tools to assess trends, and by addressing the notion of changing risks. Noted within the document are key challenges and areas that will demand special attention in the modification of CRA tools; in the background materials and

trainings for CRA facilitators; and in the guidance for interpretation of CRA outcomes. A second challenge is the application of a limited set of CRA results to guide risk reduction in other communities and to inform national and international adaptation policy. This requires specific attention for sampling and care in scaling up qualitative findings. The document also suggests where stronger linkages are needed between organizations facilitating CRAs and suppliers of climate information, particularly addressing the translation of climate information to the community level.

Yocogan-Diano, V., and T., Kashiwazaki, 2009. Rural Women and Climate Change: Challenges and Recommendations. Asia Pacific Conference on Climate Change, Asia Pacific Research Network (APRN) 23-24 March 2009, Bangkok, Thailand.

The paper moves beyond the usual climate change discourse around ecology, poverty, gender relations, and natural hazards; rather the paper highlights discourse around the developed world's greed, and the nature of "imperialist governments and their corporations" desire to control and plunder the world's remaining resources. Focus is placed on institutions such as the World Bank, the International Monetary Fund, and the World Trade Organization and their development policies and packages which have placed women at the center of climate change vulnerability. The paper also makes connections to local level development policies and process noting an existing and deepening agrarian crisis within Asia linked to land concentration to landlords, rural underdevelopment, liberalization of agriculture, and land conversion policies causing indebtedness and bankruptcy among peasant families. Recommendations given focus on rural women overcoming constraints associated with access to resources, technological support and climate change adaptation capacity development initiatives.