



WOMEN AT THE FRONTLINE OF CLIMATE CHANGE

**GENDER RISKS
AND HOPES**

A RAPID RESPONSE ASSESSMENT



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WOMEN AT THE FRONTLINE OF CLIMATE CHANGE **GENDER RISKS AND HOPES**

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PREFACE



“Women play a much stronger role than men in the management of ecosystem services and food security.”

Women are often in the frontline in respect to the impacts of a changing climate. Globally the world is seeing increasingly frequent droughts and floods which are having economic but also profound social consequences. The women and people of Asia are currently at greatest risk with over 100 million people affected in this region annually.

Patterns of development and settlements put the poor and the vulnerable at increased risk with many forced to settle on the only land available at the time – land that all too often is prone to flooding and mud slides. This report underlines that women are disproportionately likely to lose their lives in such events.

During disasters, such as drought or floods, women are also more vulnerable to organised criminal traffickers as a result of communities being scattered, and protective patterns in families and society become disrupted: a point underlined by INTERPOL and non-governmental organisations in this report and a pattern of exploitation known from armed conflicts and other disasters.

More than 1.3 billion people live in the watersheds of Asia’s mountain ranges. With more than half of South Asia’s cereal production taking place downstream from the Hindu Kush-Himalayas, the impacts on food security will become ever more important with increasing climate change. Here, adaptation will become crucial.

Women represent a primary resource for adaptation through their experience, responsibilities, and strength. This report

provides ample information to show that women play a much stronger role than men in the management of ecosystem services and food security. Hence, sustainable adaptation must focus on gender and the role of women if it is to become successful.

Women’s voices, responsibilities and knowledge on the environment and the challenges they face will need to be a central part of the adaptive response to a rapidly changing climate. UNEP welcomes the collaboration and contributions of the countries and regional institutions such as ICIMOD in strengthening the research, understanding and outreach on the important role that women play in the climate change challenge and will increasingly play in this century.

Governments have a responsibility to make gender considerations part of the response and UNEP hopes this report will play a part in providing a focus for relevant agencies operating across the spectrum of development and climate assistance to put women at the centre of their strategies.

Achim Steiner

UN Under-Secretary General and
UNEP Executive Director

SUMMARY

Adaptation, vulnerability and resilience of people to climate change depend upon a range of conditions. These vary from their degree of exposure and dependency upon weather patterns for livelihoods and food security, to varying capacities in adaptation, which are influenced by gender, social status, economic poverty, power, access, and control and ownership over resources in the household, community and society. Mountain peoples are especially vulnerable since climate impacts and changes are predominantly acute in mountainous regions. This is particularly true in the Andes, Africa and Asia.

A key challenge in responding to climate change is the increasing number of events of too much and too little water. From 1999 to 2008, floods affected almost 1 billion people in Asia. The corresponding figures were about 4 million in Europe, 28 million in the Americas and 22 million in Africa. For instance, the 2010 flood in Pakistan affected more individuals than the combined impacts of the Indian Ocean tsunami (2004), the Kashmir earthquake (2005) and the Haiti earthquake (2010). Flash floods in the Himalayas are estimated to cause the loss of at least 5,000 lives every year.

Women in the South are particularly vulnerable to the impacts of disasters due to skewed power relations and inequitable cultural and social norms. At the same time, women are essential for developing sustainable adaptation options due to their knowledge, multiple and simultaneous responsibilities and as well as roles in productive areas. These include all sectors from agriculture, rangelands, biodiversity and forests, to households, income-generation, livelihoods and other socio-cultural and political-economic institutions and relations. Worldwide, women are an estimated 43% of the work force in agriculture. In Asia and Africa, this proportion is higher, often above 50%, especially in mountain regions. Hence, women play a key role in adaptation efforts, environmental sustainability and food security as the climate changes.

However, several dynamics make adaptation more difficult for some women due to a lack of access to formal education, economic poverty, discrimination in food distribution, food insecurity, limited access to resources, exclusion from policy

and decision-making institutions and processes and other forms of social marginalisation. These dynamics put women at a distinct disadvantage, and few programmes include or focus on them for adaptation.

Women generally have far less access to and control over the resources they depend upon. Nor do they have opportunities for direct governance and effective influence in politics from the household to community, national, regional and international levels. In some contexts, women are often subject to gender-based violence, harassment and psychological violence within the household. Some studies suggest that 95% of women and girls surveyed reported first-hand knowledge of violence with 77% by family members. Such situations affect women in negative ways, and further impede women's ability to adapt to extreme events and changes in their environment.

During extreme events such as drought, floods and other climate-related disasters, women face additional risks, due in large part to gender inequities that result in women bearing the disproportional brunt of disaster impacts. Moreover, women are often discouraged from learning coping strategies and lifesaving skills, such as how to climb trees or swim. Both factors put them at a disadvantage when floods hit. Often women are not permitted to evacuate their homes without consent from their husbands or elder men in their families or communities. Gendered cultural codes of dress may inhibit their mobility during crises, resulting in higher disproportionate mortality during many disasters. During such events, women and girls are frequently subjected to intimidation, gender-based violence,

sexual harassment and rape. Women and girls also face an even more serious risk with the onslaught of climate-induced disasters: organised trafficking.

Organised trafficking of women is emerging as a potentially serious risk associated with environmental problems. Climate-related disasters such as flood, drought or famine may disrupt local security safety nets, leaving women and children unaccompanied, separated or orphaned due to the erosion and breakdown of normal social controls and protections. This makes them especially vulnerable to the exploitation of human trafficking.

After a natural disaster, economic and security challenges may lead women who are in charge of households and livelihoods to seek temporary relief, shelter and amenable living conditions in acutely insecure contexts, making them potential targets for exploitation and human trafficking. Disasters that lead to increased physical, social and economic insecurity, and affect women and children, are among some of the push factors that give rise to trafficking. Therefore, insecure disaster regions must be considered as potential areas for such harmful activities.

In Nepal, an estimated 12,000–20,000 women and children – including some boys – are abducted or deceived into forced labour (ca. 30%) and brothel-based sex work (ca. 70%) every year. Economically impoverished mountain families are particularly vulnerable to being deceived with false offers of remunerated work and education for girls, ensnaring them into a well-established system of abuse, forced labour and sex work. Some of this trafficking occurs within national and regional spheres, but foreign destinations also include India, China and the Middle East. The negative impacts from disasters may be exacerbated by the probability of contracting HIV/AIDS. For instance, approximately 12–54% of women, boys and children trafficked under normal circumstances contract HIV/AIDS. They are aged typically from 7 years of age to 22 years and averaging 16 years. Trafficked children are at particular high risk and some surveys suggest that at least 15% of them experience other forms of violence on a weekly basis in addition to sexual abuse.

Great uncertainty exists regarding the possible elevated levels of exploitation during political conflicts or climate-related disasters. Estimates based on emerging data from anti-trafficking organisations such as Maiti Nepal suggest that trafficking may have increased from an estimated 3,000–5,000 in the 1990s to current levels of 12,000–20,000 per year. The data also suggests that trafficking may have increased by 20–30% during disasters. Indeed, INTERPOL has also warned that disasters or conflict may increase the exposure of women to trafficking as families are disrupted and livelihoods are lost. Hence, targeted efforts to reduce exposure of women and children to exploitation and abuse must be supported and implemented due to increasingly extreme climatic events and rising populations and intensifying land use change, pressures and grabbing.

Women experience acute and differential impacts given the accelerated pace of climate change. These impacts exacerbate existing inequities in socially constructed gender roles, responsibilities, perceptions and skewed power relations that tend to disadvantage women. However, women also provide vital hope for successful adaptation through their critical knowledge, experience, agency and unique role in agriculture, food security, livelihoods, income generation, management of households and natural resources in diverse eco-systems, and participation in a variety of socio-cultural, political-economic and environmental institutions.

Strategically placed for both dealing with impacts and adaptation, mountain women are at the front line in sustaining their environments. Learning from them and investing in them will provide a crucial stepping stone and catalyst for future adaptation efforts far beyond mountain regions. Imagine what is possible in terms of adaptation to climate change if women are given due recognition and are included in international development efforts and policy processes as strategically important development actors in their own right. Although women are among the frontline managers of the environment, often lacking equitable access to resources and disproportionately bear the risk of climate change, they simultaneously offer the greatest hope for the future.

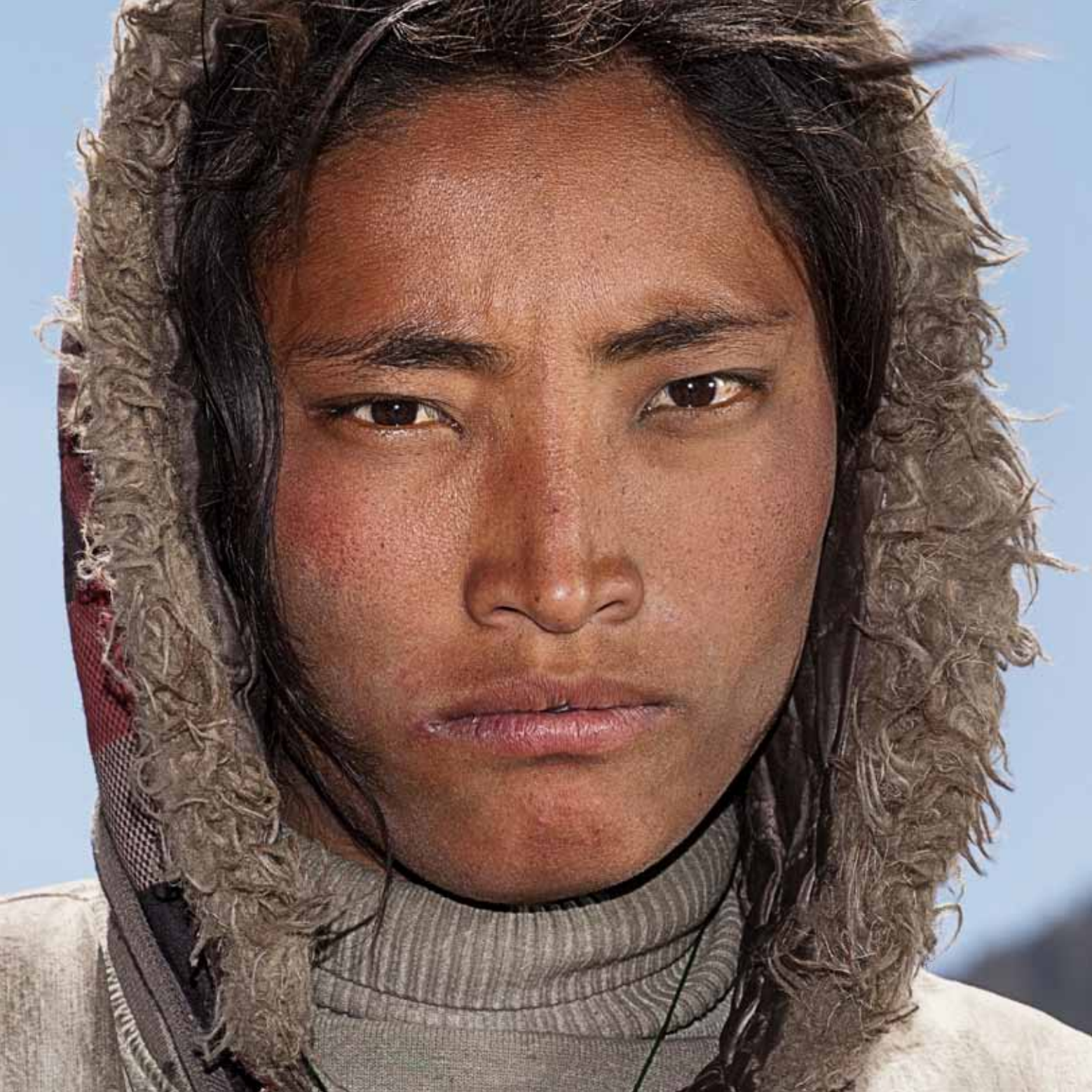
RECOMMENDATIONS

- 1** Design adaptation programmes in food security, agriculture, rangelands and managing natural resources in ways that are sensitive and responsive to the different and multiple roles women and men play in various spheres of natural resource management, as well as their households, communities, livelihoods, and customary and statutory institutions and relations (local, national, regional and international). The programmes should have a strong focus on women and gender equity to ensure successful implementation and that adequate resources are allocated to translate this vision into tangible action.
- 2** Improve women's livelihoods and strengthen adaptation by ensuring women's access, control and ownership of resources (such as land, livestock, property and income opportunities), and access to development resources such as credit, information, training and outreach, and culturally appropriate and labour-saving technology.
- 3** Invest in gender sensitive and culturally appropriate labour-saving green technologies, water harvesting, storage, irrigation systems, and substitutes for fuel wood and use (including mechanisms for maintenance). Design and implement these investments in collaboration with women to reflect their needs and concerns. Ensure that physical, cultural, social, economic and practical elements are compatible with their livelihood practices within diverse ecosystems supporting agriculture, pastures, forests, watersheds, households and communities.
- 4** Conduct a systematic analysis of climate change from environmental, development and gender equity perspectives to fill urgent gaps in research, knowledge and data. Disaggregate data by gender and other domains of difference, such as class, age, marital status, lifecycle positioning, ethnicity, caste, profession, and ensure they are understood within the context of power relations emanating from these differences. Research should focus on the differentiated experiences of women and men in terms of adaptation, impacts, responses, vulnerabilities and opportunities provided by climate and other simultaneous drivers of change. However, there should be a distinct focus on women's needs, priorities, constraints, impacts, local strategies, knowledge and meaningful participation that defines their local responses in the context of often unequal gender relations.
- 5** Ensure an enabling environment for the increased participation and substantive inputs of women in decision and policy-making in local, community, national, regional and international institutions, processes, negotiations and policies related to climate change issues. Adaptation programmes should have long-term goals of increasing gender and social security needs, safety nets and active participation of women in governance at every level through participatory policies and targets, and capacity strengthening, development of leadership and technical skills, and clear recognition and support of their rights, agency and knowledge.
- 6** Ensure that education, training, awareness raising and information programs address the vulnerability and risk of gender-based violence, sexual abuse and trafficking in the context of mountain regions, but especially in high-risk flood, drought and disaster prone areas.
- 7** Collaborate among and between national police authorities, customs authorities, anti-trafficking NGOs, research institutions and INTERPOL to detect, intercept and combat national and trans-boundary trafficking of women and children.



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MOUNTAINS AND PEOPLE IN CLIMATE CHANGE

Mountain regions have a crucial impact on weather patterns, precipitation, and snow and ice. They are also salient early warning systems that enable people to monitor and learn how we may adapt to climate change. Like the polar regions, they are characterised by greater changes in temperature than the global average (UNEP, 2010).

Recent satellite observations have confirmed that glaciers in many mountain regions are thinning (Berthier *et al.*, 2007; Paul *et al.*, 2007; Bolch *et al.*, 2008a, b) and the majority of mountain glaciers worldwide are losing their mass (Kaser *et al.*, 2006; Lemke *et al.*, 2007; Arendt *et al.*, 2009; Bhambri & Bolch, 2009; Nicholson *et al.*, 2009; Wang *et al.*, 2009; Yang *et al.*, 2009; Yao *et al.*, 2007; Caidong and Sorteberg, 2010; Federici *et al.*, 2010; Kaser *et al.*, 2010; Liu *et al.*, 2010; Peduzzi *et al.*, 2010; Shahgedanova *et al.*, 2010; Shekhar *et al.*, 2010; UNEP, 2010).

Effects of intensified land use, demographic shifts and climate change pressures are increasing the occurrence of events of water related disasters in downstream areas. Glacial lake outburst floods (GLOFs) and the frequency of flash floods have also increased in recent times (Cenderelli and Wohl, 2003; Richardson and Reynolds, 2000; Carey, 2005; Chen *et al.*, 2010; Dussaillant *et al.*, 2010). Within the Hindu Kush-Himalayan region, such changes have great regional variability (Immerzeel *et al.*, 2010; Pellicciotti *et al.*, 2010), spatial variability and immense socio-cultural diversity. This variability and diversity has important implications in terms of adaptation responses.

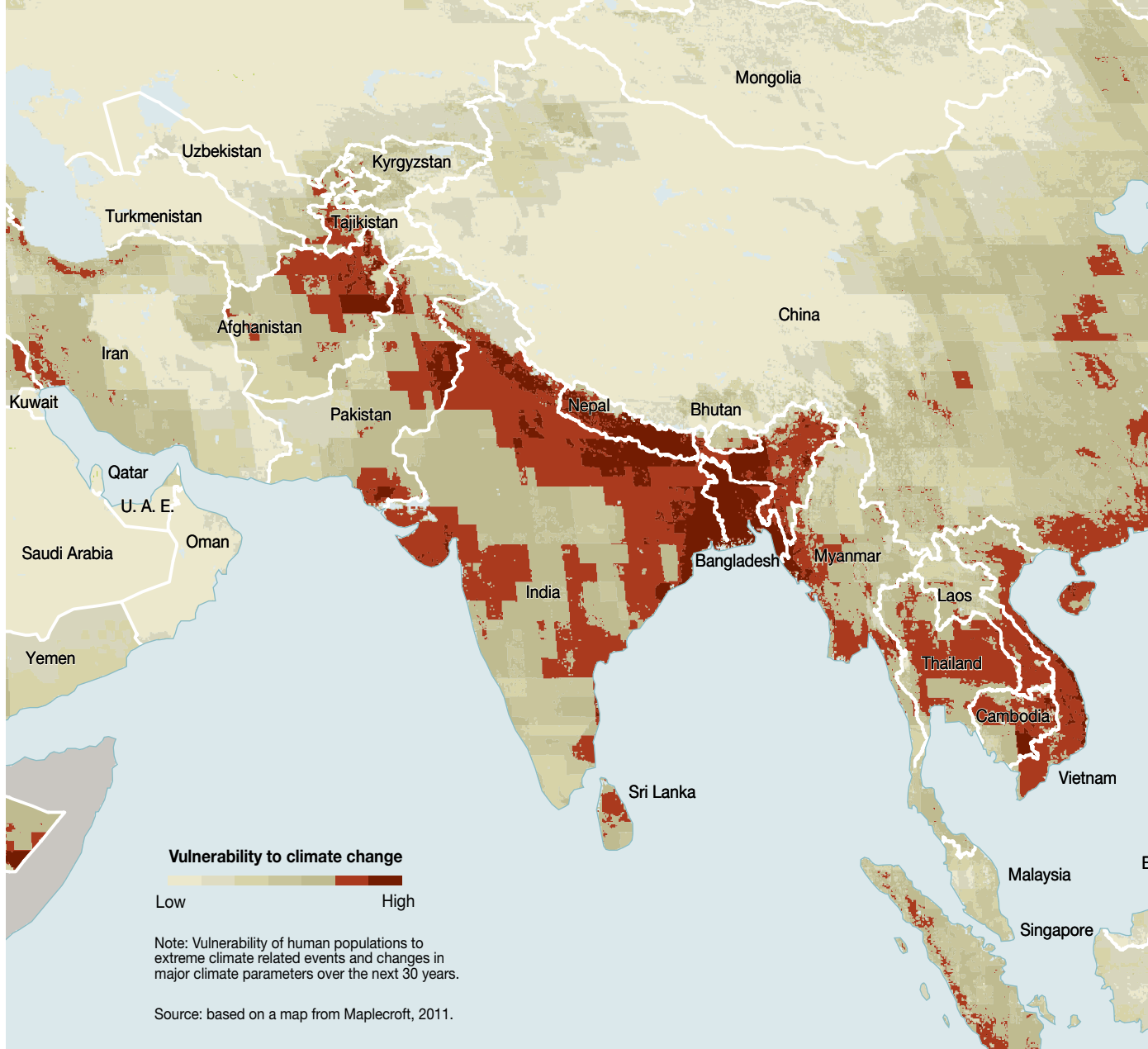
The Hindu Kush-Himalayas supplies water resources, together with the monsoons, for irrigation – some 75-90% of the water consumed for over 55% of Asia's cereal production and nearly 25% of the world's cereal supply (UNEP, 2009). Correspondingly, mountain regions worldwide supply water to livestock and clean drinking water to billions of people around the planet (UNEP-WCMC, 2002; 2004). However, they also have another crucial resource in a changing world: mountain people.

Over 210 million people inhabit the Hindu Kush-Himalayas and about 1.3 billion people populate the water basins located downstream. Mountain peoples' livelihoods are based on agriculture, livestock raising, management of natural resources, migration, labour-intensive household management and income generation through small scale trade, and wage and casual labour (Leduc and Shrestha, 2008). For millennia, mountain people have learned to adapt to changing seasons and extreme weather conditions (*ibid.*), while planning for regular disastrous events of too much, too little water and extreme temperature changes that affect their wellbeing and survival (UNEP, 2004; Rhoades, 2007; ICIMOD, 2009a).

Simultaneously, this situation has generated experiences and adaptation techniques relevant to such crucial aspects as disaster preparation and mitigation, food security and planning capacity, especially for water storage (Leduc, 2009; Salick *et al.*, 2009; UNEP, 2010). For instance, farmers in several Himalayan contexts, such as in the Mulkrow Valley in Chitral, northern Pakistan, are now increasing food and water storage capacities to better prepare for floods and droughts (Dekens and Eriksson, 2009).

There are signs that increasing climate variability may pose challenges to indigenous knowledge in terms of new modes of coping with environmental stress (ICIMOD, 2009a, 2009b). For instance, climate change will have impacts on the entire hydrological cycle in mountain areas (Eriksson *et al.*, 2009), strongly exacerbating existing challenges and pressures of land use where they exist, demographic changes and other

Climate change vulnerability



pressures that may lead to enhanced flood risk or drought. At the same time, indigenous knowledge also provide important opportunities for context and culturally specific early warning systems, modes of engineering and architecture that are often less expensive and take little time and resources to reconstruct following disasters (Verma, 2007).

Women play a crucial role in mountain societies as a very significant proportion of the work force in food production (FAO, 2011) and as key players in managing and sustaining their natural resources and environments. At the same time, while being central for opportunities to adapt to changing climates, they are often disadvantaged in terms of power relations and accessing resources, and exposed to increased risks associated with

climate change during disasters and lost incomes from climate shocks. These risks include further marginalisation, exclusion from decision-making, dislocation from access to resources for survival, and exacerbation of risks of being trafficked for forced labour and the sex trade.

The following chapters present an overview of central issues relevant to opportunities for adaptation – and also the risks that women are exposed to with climate change in mountain regions. Strategically placed for dealing with both impacts and adaptation, mountain women are the front line sustainers of their environment. Learning from them and investing in them will provide a crucial stepping stone for future adaptation efforts far beyond mountain regions.





CLIMATE CHANGE IMPACTS

In mountain regions and downstream communities, the challenges of ‘too much and too little water’ are among the primary concerns resulting from climate change (Chettri *et al.*, 2008; Schild, 2008; Eriksson *et al.*, 2009; Sharma *et al.*, 2010; Bajracharia *et al.*, 2010; Rasul, 2011; ICIMOD, 2009). The following findings illustrate the impacts of climate change on people and their environment across the region.

IMPACTS ON THE ENVIRONMENT AND WATER RESOURCES

Over the last 100 years, warming in the Himalayas has been much greater than the global average of 0.74°C (IPCC, 2007; Du *et al.*, 2004). The particular sensitivity of the Himalayas to climate change raises concerns about its role as a major supplier of water to the Asian region. Himalayan glaciers and rivers contribute a high percentage of the water resources for Asia’s main watercourses and basins. The amount and distribution of water in the region has a profound effect on the overall health of many South Asian industries, economies, agricultural production, food security and livelihoods.

As well, the dependence of Asia’s countries on mountain water supplies is even more complex because the average rainfall in the region is so varied and unequal. It ranges from extremely low amounts (<100 mm) in the Kunlun Shan of China to the highest average annual rainfall on earth of more than 12,000 mm in Cherapunjee, India.

For example, the rivers of Nepal contribute to about 40% of the average annual water flow in the Ganges Basin, which is home to 500 million people or about 10% of the total human population of the region. More importantly, these rivers contribute about 70% of the water flow in the dry season (Alford, 1992) and therefore have significant impacts on the bio-physical environments, biodiversity and people.

In China, the Yangtze River supplies water to industry, agriculture, and 500 million domestic consumers. In 2006, the river experienced the flow in its lowest upper reaches since

the 1920s. Upstream dryland expansion, melting glaciers, and aggravated sediment deposits affect downstream flood discharge capacity (Wang *et al.* 2005) and present risks to the world’s largest hydroelectric installation, the Three Gorges Dam, and its downstream populations.

The importance of runoff originating from snowmelt and glacial melt is also relevant to irrigation use. The Indus Irrigation Scheme in Pakistan depends on runoff originating from snowmelt and glacial melt from the eastern Hindu Kush, Karakoram, and western Himalaya for 50% or more of its water (Winiger *et al.* 2005). This affects the lives of many people and their livelihoods.

The impact of climate change in the Himalayan region will also lead to more unpredictability of natural disasters. Not only are natural hazards becoming more likely to happen, they are also increasingly destructive and fatal. According to the United Nations International Strategy for Disaster Reduction (UNISDR), seven of the top ten natural disasters in 2008, quantified by the number of deaths, occurred in countries such as Afghanistan, China, India and Myanmar (UNISDR, 2007). In 2007, disasters in Bangladesh, China, India and Pakistan accounted for 99% of the total deaths in disasters worldwide (82% in 2007) (UNISDR, 2007).

TOO MUCH AND TOO LITTLE WATER

Climate change results in increased occurrences of natural disasters and the Himalaya is particularly affected by water related-disasters, often floods. The intensity and duration of such disasters is highly variable and generally exacerbates



existing environmental issues that the region faces. At stake are changes in ecosystems and agricultural lands and decreases in crop and natural resource supplies. This impacts the food security and livelihoods of a significant number of people with often severe consequences. For example, flash floods in the Himalaya are estimated to cause the loss of at least 5,000 people every year (Jianchu *et al.*, 2006) and probably affect a much higher number of people in different ways. The destruction of bridges, roads and buildings affect people's livelihoods and possibilities for mobility, communicate and work. The destruction also affects important supply pathways.

Mudslides and unstable grounds induced by floods are serious threats to settlement areas. The region is particularly flood-sensitive due to the rough topography of the Himalaya, combined with the precariousness of many homesteads with low incomes and limited access to development services. Moreover, the risks of death and destruction are increased by the fact that after floods, people often rebuild on the same risk-prone areas. Himalayan inhabitants face many different kinds

of impacts due to unstable grounds, decreased agricultural production and long term flood-related disasters.

These disasters extend beyond the Himalayan region to affect a much wider territory and a great number of people. From 1999 to 2008, floods affected close to 1 billion people in Asia, whereas the corresponding figures were about 4 million in Europe, 28 million in the Americas and 22 million in Africa. Over the last 30 years, floods and landslides in South Asia have caused more than 65,000 deaths and affected approximately a billion people, accounting for about 33% of all the flood events in Asia (Shrestha and Takara, 2007).

The largest problems occur in flood prone areas with high population densities because of the sheer number of people affected. This includes parts of northeast India, south-central Nepal, central and southern Pakistan, large parts of Bangladesh and the lower reaches of the large rivers in China.

In India, flooding has affected about 40 million people annually and caused damage estimated to be as high as USD 240 million



as an annual average. Forty million hectares of land are at risk every year and an average of 1,800 people are killed by floods annually in India.

In China, 8% of the middle and lower reaches of the seven large rivers are prone to floods. On average, approximately 130 million people are exposed to flooding every year and about 2,000 people die in floods every year. The flood prone parts of China are where one-half of the country's population lives. This region produces 70% of the industrial and agricultural value for the country. More than 8 million hectares are flooded annually, and more than 100 medium to large cities have been affected by flooding during the past 30 years. The resulting economic losses are almost 25% of the annual world economic loss caused by floods.

In Bangladesh, 86 million people were affected by natural disasters, primarily floods, between 1998 and 2008. In Pakistan, in August 2010, two weeks of intense monsoon rains caused major rivers to wash away roads, bridges and croplands. The Pakistan flooding affected an estimated 20.5 million people - over 1,700 were killed, 6 million were displaced and

1.89 million houses were destroyed. By November 2010, over 7 million were still affected and lacked proper housing.

Parts of Nepal are also vulnerable to seasonal flooding and an estimated 250-300 people die in floods each year while 5-6 million are physically exposed to flooding. A single flash flood in 1993 knocked out half of Nepal's electricity production for several months causing a major economic impact in the country (NCVST, 2009).

The consequences of climate change are also being felt with the increasing scarcity of water at particular times. The implications of reduced water availability, both from rainfall and glacial flow supplies from the Himalayas, will severely impact agriculture and food reserves. UNDP (2006) warns that increased temperatures and water stress may lead to a 30% decrease in crop yields in South Asia by the mid-21st century.

Besides the availability of water, access to freshwater is at risk as projections indicate that this may decrease by the 2050s (UNEP, 2009).



GENDER AND ADAPTATION TO CLIMATE CHANGE

It is widely recognised that climate change does not affect people equally. The related disasters and impacts often intensify existing inequalities, vulnerabilities, economic poverty and unequal power relations (Brody *et al.*, 2008; IPCC, 2007). Differently positioned women and men perceive and experience climate change in diverse ways because of their distinct socially constructed gender roles, responsibilities, status and identities, which result in varied coping strategies and responses (Lambrou and Nelson, 2010; FAO, 2010a).

Often, women are more vulnerable to climate change than men. This is because they make up the majority of the world's economically poor, do most of the agricultural work, bear unequal responsibility for household food security, carry a disproportionate burden for harvesting water and fuel for everyday survival, and rely on threatened natural resources for their livelihoods (UN Women Watch, 2009; Terry, 2009; Mitchell *et al.*, 2007). Moreover, they have unequal access, control and ownership to these natural resources, and are

often excluded from important decision and policy-making forums and institutions that govern them.

At the same time, women are active agents of adaptation in rapidly changing contexts who negotiate, strategise, contest and resist relations, discourses and policies that disadvantage them. They actively interpret, give meaning to and adapt to global changes in local contexts in ways that are appropriate, sustainable and culturally specific (Verma, 2001; Ferguson and Gupta, 1997; Moore, 1993).



Gender and climate change

by Dr. Eve Crowley, Deputy Director, Gender, Equity and Rural Employment Division, FAO

Scientists agree that climate change will likely lead to sea level, temperature and acidity rises, glacier melt, an increased incidence of floods, droughts and hurricanes in different geographical areas, and a shift in agro-ecological zones with concomitant effects on the diversity and range of plant and animal species and associated pests and diseases. These impacts will affect geographical zones differently and, in some cases, they are expected to affect human populations differently.

The literature on gender differentiated impacts of natural disasters (Neumayer and Plümper, 2007) suggests that the impacts of climate change will also be gender differentiated. As with natural disasters, climate change is likely to exacerbate previously existing patterns of discrimination that, on average, render women more vulnerable to fatalities and reduce their life expectancy, especially for economically poor women, more than men. In some regions, men may have higher mortality rates from parasitic and infectious diseases in droughts and famines, reckless behaviour or a higher propensity to engage in outdoor activities during severe weather events. However, in cultures that restrict women from leaving their houses unaccompanied or from learning to swim or to climb trees, women may suffer greater injury and fatality in some kinds of climate change-induced natural disasters. Long attire and household and childcare responsibilities can make it difficult for women to seek safety in a timely fashion, increasing the risk of fatality and injury. These risks may further increase due to isolation, heavy workloads, and lower formal educational levels that limit women's access to disaster related information, and emergency shelters that are ill-equipped to accommodate women and girls with privacy or separate toilet and sleeping facilities. Other causes of concern are evidence of higher mortality rates for female infants and girls associated with discrimination in food distribution within households and in emergency relief and assistance efforts in times of climate-induced food shortage and famine.

Coping strategies are often also gender differentiated. For example, climate change-induced flooding, drought, and changes in forest management are over time likely to increase women's workloads in domestic fuel and water collection in

some regions. This will therefore, reduce their time available for childcare, education and participation in public life. In some contexts, this may undermine the physical safety and health of women and children or increase the incidence of child labour, as children are enlisted for family survival rather than sent to school.

After successive natural disasters, economically poor women, with few of their own financial, land or other assets to begin with, are likely to lose the minimal buffer they have and face increased indebtedness, inequality and economic poverty. In some countries, climate change appears to be inducing men (and sometimes women) to migrate in search of work. This increases the workload of those who stay behind, especially women who must assume both agricultural and domestic workloads, the benefits of remittances notwithstanding.

Clearly, policymakers, non-governmental organisations, and the academic community need to pay closer attention to the gendered nature of climate change adaptation and impacts. Women will need to be at the centre of research, policy and action on climate change adaptation if these disproportionate risks and consequences are to be avoided. This is not just a matter of justice and equality. It also makes good economic sense.

FAO's recent report *The State of Food and Agriculture 2010–2011: Women in Agriculture: Closing the Gender Gap for Development* (2011) shows the economic cost of gender inequality in access to assets for agricultural growth and food security: "Closing the gender gap in agriculture would generate significant gains for the agriculture sector and for society. If women had the same access to productive resources as men, they could increase yields on their farms by 20–30%. This could raise total agricultural output in developing countries by 2.5–4%, which could in turn reduce the number of hungry people in the world by 12–17%." Women's labour, power, knowledge, expertise, and organisations, the responsibilities they have for household management and their roles in stewarding food, water, fuel and natural resources for households and communities make them indispensable allies and innovators in any efforts at disaster risk reduction and climate change adaptation in rural areas now and in the future.

Climate change and gender – Are we downplaying social vulnerability?

by Dr. Fatima Denton, Program Leader, Climate Change Adaptation in Africa, IDRC

Climate change has several implications for human security especially given its wide-ranging impacts on critical livelihood sectors and on communities with the least capacity to adapt. While women are important actors in managing natural resources and environmental change, it is also important to focus on the complex questions about how different social groups experience vulnerability to climate change. Both biophysical and social vulnerability have implications for economically poor and socially excluded women and men that shape their livelihood strategies. Climate change is superimposed on existing vulnerabilities. However, given that access and management of environmental resources are socially constructed (Masika *et al*, 1997; UNEP 1995), it is fair to assert that women and men experience vulnerability to environmental change differently, and hence, environmental degradation will have differential impacts on women and men.

Economic poverty and vulnerability are not uniformly correlated – but economically poor people and socially excluded groups tend to suffer disproportionately from vulnerability. Vulnerability also varies across space and social groups (Wilbanks, 2007). The exposure, sensitivity and responses to climate perturbation and to stresses and shocks of one social group may vary quite significantly from another and differ across regions, countries and even within a given community. Given that vulnerability is a contested term, the emphasis should be on the elements that conspire to constrain the ability of one social group to act and mitigate climate related risks.

Environmental management and change are conditioned largely by gender and associated power dynamics. The way in which women and men use the environment is generally shaped by differentiated needs and varying perceptions. For instance, gender differences can be observed in the way women and men use and manage natural resources; in the asymmetrical relationships within the household and broader community, and how these relations affect and condition women's and men's access to resources. These differences can manifest in terms of ownership of environmental

resources, and the extent to which environmental risks and opportunities are perceived, addressed and distributed. Given these differential relations of power, more weight needs to be given to social vulnerabilities and institutional processes that tend to lock economically poor and socially excluded women and men in an environmental bind where they have few options or safety nets.

Formal or informal institutions have the ability to empower or constrain social actors in adaptation action (Gupta, 2010). Vulnerability assessment is contingent on a good understanding of institutions and roles in the distribution of resources and the enforcement of rights and regulations for the management of environmental goods (Kelly and Agder, 2000). Hence, for narrowing the current differential vulnerability between social groups, the biggest challenge is the way in which institutions are able to level the adaptation playing field. Institutions may be able to allow women equal access to frame their adaptation questions and ensure that critical flows of information, knowledge and other resources – fundamental for a climate resilient adaptation – are not excluding economically poor women based on their social status, class, caste, gender or other domains of difference.

The current debate on the intersection between gender and climate change needs to promote understanding about how multiple vulnerabilities and receptors compete to further reduce the adaptive capacity of economically poor and socially excluded women and men in ways that further alienate them from knowledge. For example, men farmers tend to share critical types of information and resources but women are often served last because they are often excluded from and have limited access to the core strategic groups that meet in such knowledge hubs. It is often these asymmetries – demonstrated through access to knowledge, farming inputs, infrastructure and learning hubs through farmers groups – where adaptation processes and knowledge need to go through a collective process of framing, validation and monitoring. This would allow experiential social learning to embed in people's reflexes and behaviours.





Women at the frontline of climate science and policy

by Dr. Asuncion Lera St. Clair, Lead Author, Intergovernmental Panel on Climate Change Fifth Assessment Report, Working Group II

Listening to the voices of women and increasing our awareness of gender perspectives in the climate change debate matters not only because of all the substantive reasons outlined in this Rapid Assessment, but also because they are fundamental to fulfil two pressing tasks. First, there is an urgency to produce credible scientific knowledge based on social science and humanities that contextualises and gives meaning to both the risks and the opportunities posed by climate change. Second, it is of fundamental importance that policy decisions at any scale (from local to national, regional or global) are designed in such a way as to be considered credible and relevant by the people for whom such policies are addressed. Women's voices are important because they will increase the quality and relevance of both science and governance.

It has taken over two decades of climate science to establish the scientific basis of the problem. Although much more climate science is needed, there is now an urgency to understand what climate change means for people, for our institutions and for our future as social human beings. In addition, there is urgency to devise solutions that go far beyond technological innovation

and market mechanisms. While these are needed, it is unlikely that individuals and societies will transform and change towards more sustainable paths unless we understand questions such as: What kinds of institutional dependency prevent a transition towards sustainable practices? What role do entrenched interests and power have in perpetuating unequal access to and unsustainable use of existing resources? How is it possible to change legal instruments that benefit the wealthy and polluters to be more democratic and respectful of equal rights and the environment? How is policy made, which perspectives dominate in shaping policy decision and who has decision making power in the public sphere? How can we assure the rights of future generations are valued correctly? What is a good "lifestyle" in the Anthropocene? How do people's identity change when they consider those suffering from climate related impacts, or the difficulties likely to be encountered by future generations? What is the role of culture as a barrier or driver of change?

We need answers to these questions from a gender-disaggregated perspective, and we want such answers from women's perspectives as well as men's. Gender studies,

Most importantly, to understand the role of women in adaptation to climate change, we need to understand power relations between and among women and men, and the way that climate change can exacerbate and widen these relations (Brody *et al.*, 2008). Hence, not all women and not all men contribute to climate change in the same way (Terry, 2009; Johnson-Latham, 2007; Connell, 2005). Nor are women and men affected equally because differences in impacts and adaptation vary according to their multiple and overlapping identities, roles and access to resources that are mediated by gender, class, caste, ethnicity, marital status, life-cycle and household positioning, etc

GENDER INEQUITIES IN AGRICULTURE AND FOOD PRODUCTION

Given the above arguments and findings, the situation is similarly acute for millions of mountain women who struggle

on a daily basis for survival for themselves and their families under harsh environmental conditions and power relations that disadvantage them socially, economically, culturally and politically. Studies indicate that women are responsible for 65% of household food production in Asia, 75% in Sub-Saharan Africa and 45% in Latin America (Robinson, 2006; UN Women Watch, 2009). Recent studies from FAO indicate that women contribute approximately 43% of the agricultural labour force in the South, ranging from 50% in Africa and Asia to 20% in Latin America, however the statistics vary depending on specific types of crops and activities (FAO, 2011). Such regionally aggregated statistics covering a large number of countries across diverse contexts sometimes mask differences in some countries such as Nepal. In this mountainous country, the gender division of labour is highly skewed, especially when agricultural, pastoral and wage labour is combined with household, community and casual

feminist epistemology, political ecology or ethics of care are part of the social and the human sciences and primarily practiced by women researchers. Moreover, across the planet there is a disproportionate presence of women researchers in the social and the human sciences, although their numbers are low in senior positions as they hit glass ceilings in various institutions. However, this type of knowledge generated by social and human sciences is precisely that which has to reach policy makers in order to increase compliance, relevance, effectiveness and legitimacy in constituencies. People tend to abide by policies that they relate to and understand.

Although climate policy-making has been limited to market mechanisms, we know these would not be sufficient to change human behaviour, redesign institutions or lead to the much needed systemic and structural changes. There is urgency for the processes of policy formulation to be respectful and informed by people's own aspirations and understandings of what changes are necessary and what futures to construct. Such information is always gender sensitive and likely to arise when policy-making processes are gender aware. These processes will lead to policy that is understood, accepted and implemented in meaningful ways.

Lastly, we have learned in the past decades that having women in politics matters. In climate policy making and negotiations, men

are a very large majority. The complexity and uncertainty of the issues, however, makes the policy process challenging. Much of the process is about value judgments and perceptions of risk. This calls for an understanding of policy in innovative ways. We know, through many other topics, that women tend to have a more cautious view of risks. There is empirical evidence that women are less likely to gamble with the future or to take risks about issues that may affect their own well-being and that of their children and families.

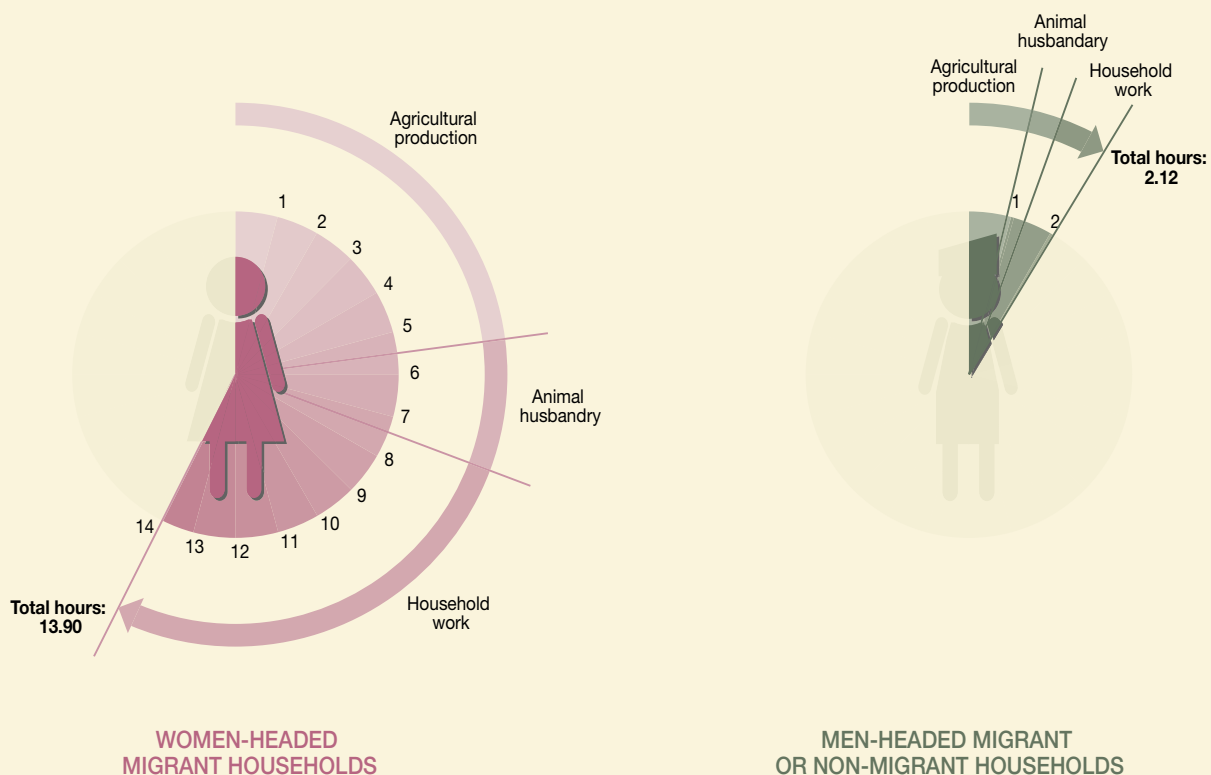
Increasing the presence of women in climate negotiations may make the processes more effective, and increasing the presence and substantive participation of women in policy making may lead to more credible and legitimate policy instruments. Importantly, the participation of women can also act as a catalyst for changes in existing unequal gender power relations in a society where climate change policy will be implemented. In short, we need more women in climate change science and we need a greater valuing of the sciences that women tend to favour, as well as greater support for pioneering women in male-dominated scientific and engineering fields. We need more women in climate change negotiations giving their voices to the policy decision-making processes. We need women at the frontlines of a new climate science and new forms of climate politics.



labour, and when high rates of men's out-migration to urban cities, towns and cross-border destinations in the region and beyond, are considered.

Recent comparative research on the 'feminisation' of agriculture and natural resource management, undertaken by ICIMOD and supported by IFAD, illustrates this trend, whereby in some mountain regions in India women undertake 4.6 to 5.7 times the agricultural work men carry out. In Nepal, the range is skewed even more with women carrying out 6.3 to 6.6 times the agricultural work that men carry out (ICIMOD, forthcoming). Furthermore, national reports often present up to 64% of the population of women in South Asia as being "non-active or non-reported", reflecting that much of women's work in rural areas is informal, non-formal, unpaid and not counted, and thus goes unrecorded (FAO, 2010a).

Activity profiles for agriculture production by gender - Nepal and India

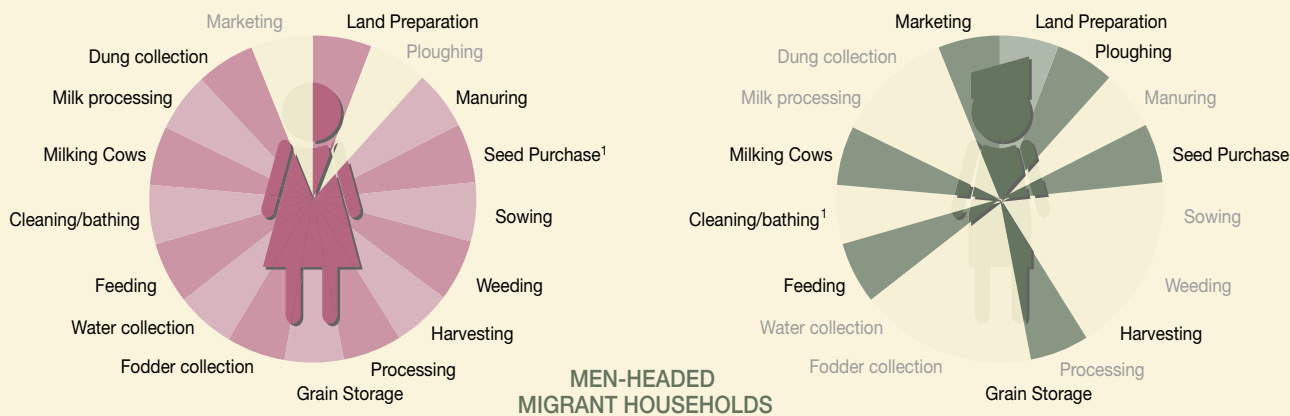


Note: Based on research surveys conducted in 12 villages in 6 districts in India (Jain, A., 2010) and Nepal (Lama, K., 2010).

Source: Verma, R., Choudhury, D., Khadka, M., Jain, A. and Lama, K., forthcoming, 'Feminization' of Agriculture and Natural Resource Management in the Himalayas, IFAD funded project, Kathmandu: Nepal

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Gender division of labour in agriculture and household activities Nepal and India



Notes:

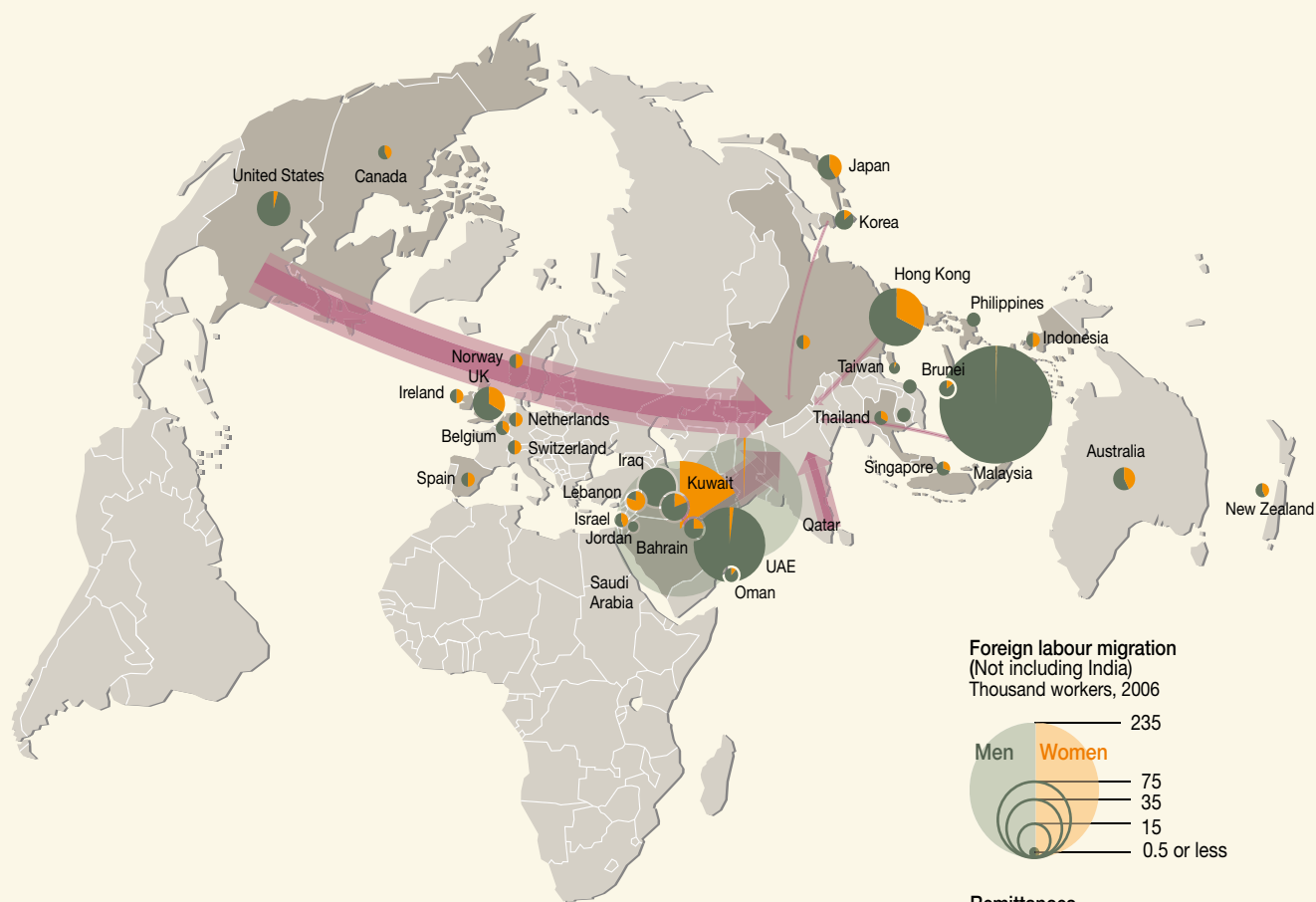
1. Activity observed in Nepal only

Based on research surveys conducted in 12 villages in 6 districts in India (Jain, A., 2010) and Nepal (Lama, K., 2010).

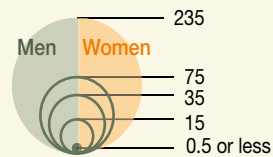
Source: Verma, R., Choudhury, D., Khadka, M., Jain, A. and Lama, K., forthcoming, 'Feminization' of Agriculture and Natural Resource Management in the Himalayas, IFAD funded project, Kathmandu: Nepal

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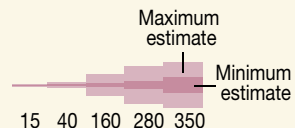
Labour migration from Nepal



Foreign labour migration
(Not including India)
Thousand workers, 2006



Remittances
Million US dollars, 2006



Sources: Kollmair, M., et al., *New figures for old stories: Migration and remittances in Nepal*, Migration Letters, 2006; NHRC, *Trafficking in Person Especially on Women and Children in Nepal*, 2008.

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GENDER DISPARITIES IN ACCESSING AND CONTROLLING RESOURCES

Another important illustration of the asymmetrical power relations between women and men is their unequal access, control and ownership of resources such as land, property, livestock, labour, and development resources including credit, agricultural inputs, technologies, trainings, and information. For instance, land is the most important asset that households depend upon for agriculture and sustaining their livelihoods (FAO, 2011). It is a material and productive resource, which is critical for farming, pastoralism and food production. However, land also has powerful social, cultural, economic, political, symbolic, spiritual and status-defining meanings (FAO, 2011; Verma, 2007a). Yet women's ownership, security and control over land as a critical resource represents one of the widest disparities in gender relations and equality. These trends are becoming even more serious in current contexts where land grabbing by powerful elite, corporate, multi-national and foreign interests is disenfranchising women from land ownership and control even further (Daley, 2011; Behrman, 2011; Verma, forthcoming).

Women also have differential control and ownership of livestock within agriculture, rangeland and household management. Livestock are important to wealth saving and security in times of crises, for dowry and brides' wealth, and act as powerful symbols of wealth and property (Verma, 2007b). Women's ownership of livestock is shaped and constrained by economic opportunities, opportunity costs of women's labour (Thomas-Slayter and Bhatt, 1994, Heffernan *et al.*, 2003, in Kristjanson *et al.*, 2010), as well as cultural norms, gender biases and power relations. Given that gender relations reflect differential wealth and power, in some contexts, women and children own and handle smaller livestock, which are a crucial part of the food security of an estimated 678 million of the world's rural people keeping livestock (Devendra and Chantalakhana, 2002).

Women also have differential access to income generating opportunities, wage labour, markets, income and socio-cultural and political-economic institutions. Often, women do not control the proceeds of their own labour from income generating activities or wage labour (Mackenzie, 1995; Verma, 2001). This is especially true where income earned is paid to the "household head" or "title deed owner" of land (*ibid.*, *ibid.*),

or where men as the "heads" of their households have out-migrated but they or other elder men in the extended family continue to control decisions.

Moreover, gender gaps in earnings persist across almost all employment categories, including informal wage employment and self-employment (ILO, 2008). ILO data for 2007 indicate that 59% of women in the total labour force in South Asia work as contributing family workers, compared to only 18% of men (ILO, 2008). Corresponding figures are 35% of women compared to 18% of men for Sub-Saharan Africa and 7% of women compared to 4% men in Latin America (ILO, 2008; FAO, 2010a). Countries such as Nepal, India and Bangladesh have particularly high proportions of women in the agricultural sector, with approximately 60% of the women work force engaged in agriculture, to produce mainly rice and poultry (FAO, 2010a). Women also receive less pay than men counterparts, ranging from 20-50% of men's salary in countries such as Afghanistan, to 57-79% in India, Pakistan and Bangladesh, putting them again at a disadvantage when it comes to financial resources and buffers to cope with climate change and disasters (FAO, 2010a).

SKEWED GENDER DIVISION OF LABOUR – LONGER, ACUTE WORKING DAYS FOR WOMEN

Women play a critical role in agricultural and pastoral livelihoods, often bearing significant responsibility for managing critical productive resources such as land, water, livestock, biodiversity, fodder, fuel, and food. They also contribute work and energy towards income generation and carry out a disproportional amount of daily labour compared to men in household and community spheres, such as cooking, cleaning, child care, care of older or sick family members, providing work for collective projects and during weddings, funerals and other cultural ceremonies.

"The common denominators for mountain women are the hardship of their living and multitude of gender based discriminations, but also a rich knowledge and diversified skills in managing natural resources, high contribution to the wellbeing of their household and community, and their resilience to face the global challenges." (Leduc, 2008)

The unequal gender division of labour is further skewed by climate change, as distances travelled by women increase to access natural resources (such as water, fuel wood, fodder, food, pastures, medicinal plants, fuel, and crops) and as production schedules take hits under rapidly changing environments and climate conditions. In fragile mountain ecosystems, women are rendered particularly vulnerable where the slopes of agricultural fields are steep, landslides and erosion are common and accessibility to basic services such as transport, education, health care and development services is limited. In such mountain contexts, women carry out and are chiefly responsible for the arduous and dangerous task

of collecting and carrying water, fuel wood and fodder for everyday sustenance.

In addition, women have valuable indigenous knowledge about managing their environments, context-specific skills developed in response to mountain conditions, technical know-how in relation to agriculture, pastoralism, and forest and watershed management, and the ability to cope with the everyday changes brought about by climate and other drivers of change. Gendered indigenous knowledge also manifests itself in predictions and interpretations of local climate conditions given women's labour and responsibilities that bring them in close and regular



contact to natural environments and biodiversity. Despite these critical roles, the data and statistics outlined in the below section clearly demonstrate the challenging situation and position of many women in the Hindu Kush-Himalayan region as they carry out these important roles.

OTHER CRITICAL GENDER INEQUALITIES

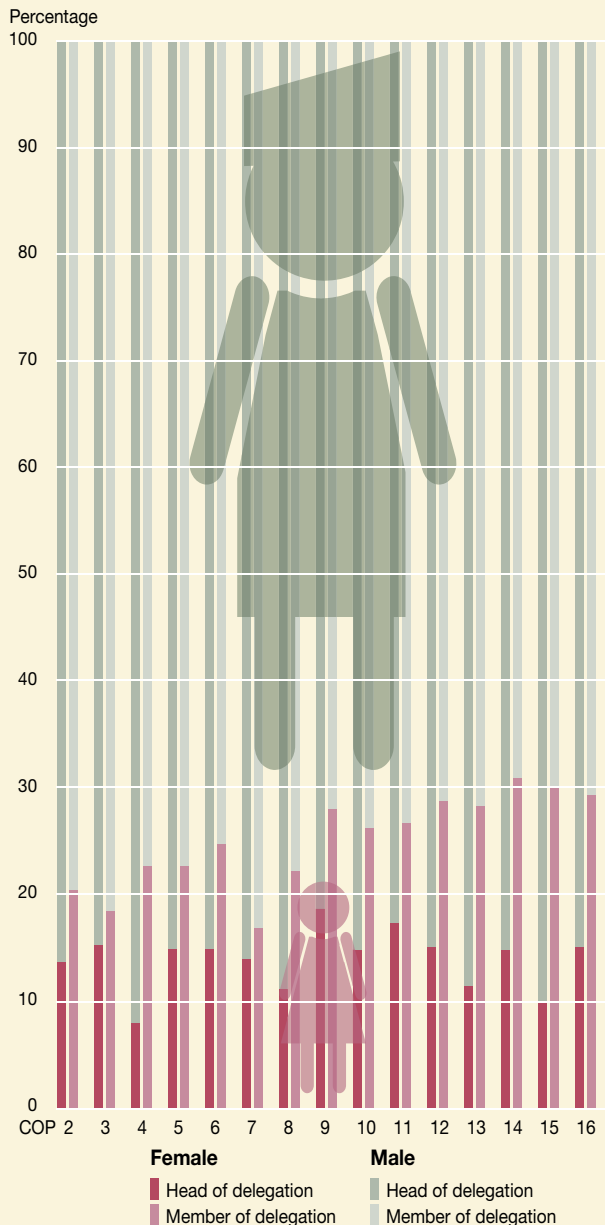
Although emerging data on gender differences in formal education, primary enrolment and secondary completion rates and ratios indicate a narrowing of gender gaps worldwide, some gaps remain, especially in South Asia and Sub-Saharan Africa

(UNDP, 2010a). The differences are still wide in some countries of the HKH, such as Nepal, where girls have less access to formal education than boys so only 17.9% of women compared to 39.9% of men have at least secondary education in 2010 (UNDP, 2010b). Literacy rates in 2006 for Nepal indicate gender differences with 81% for men and 54.5% for women (UNDP, 2009).

For instance, Nepal is ranked as 138 out of 169 nations in UNDP's Human Development Index and is described as having "low human development". In Nepal, women have limited access to health services, as evidenced by the maternal mortality rate estimated from 2003 to 2008 at 830 maternal



Gender (im)balance in the delegation of parties (COP) on climate change



Source: Gender CC, accessed November 2011.

deaths per 100,000 live births. Only 19% of births were attended by skilled health personnel (UNDP, 2010b). Women are also subject to gender-based violence, relationships that are disadvantaged by skewed gender relations and harassment and psychological violence within the household. According to SAATHI and the Asia Foundation (2007), 95% of women and girls surveyed reported first-hand knowledge of violence and 77% said family members afflicted the violence (ADB, 1999).

Despite these pressing issues, women in Nepal are not represented equally in policy and decision-making. For instance, women have 33.2% of the total seats in parliament (UNDP, 2010b), represent 14% of the total legislators, senior officials and managers, hold 7.4% of administrative and managerial positions, and hold 9.5% of positions in the higher judiciary (UNDP, 2010b:226). Similar trends are reported in Pakistan and Bangladesh, where women are only 3% and 10% respectively of total legislators, senior officials and managers, and 5.6% and 8.3% respectively of administrative and managerial positions (ibid.). Nor are they equally represented in organisations dealing with natural resource management or climate change. For instance, women are only 3% of the personnel in Nepal's Ministry of Forest and Soil Conservation (Khadka, 2010).

Also of critical importance is the under-representation of women in policy and decision-making institutions, in dialogue on adaptation to climate change, in the governance of natural resources and in other important livelihood dimensions. Numerous position papers on climate change recognise and argue the importance of integrating gender issues and increasing women's participation in climate change negotiations and processes (IUCN – The International Union for the Conservation of Nature, Gender CC – Women for Climate Justice, GGCA – Global Gender and Climate Alliance, etc.). This is important, but critical bodies on climate change have an under-representation of women, and in particular, women from the South (MacGregor, 2010). Moreover,

“For adaptation funding to be effective and efficient, as well as equitable, it is crucial that poor women are fully involved, and that their experiences and needs are reflected and prioritised in both policies and interventions for adaptation and climate change.”
(Mitchell *et al.*, 2007:4)



although women play a central but disproportionate role in sustaining livelihoods and the environment, there is little evidence that specific adaptation efforts, policies, funding and institutions target them (Mitchell *et al.*, 2007). The voices of economically poor women from the South are rarely heard in negotiations on climate change adaptation and processes (*ibid.*).

Hence, in the future, it will be important to increase women's participation and meaningful inputs into to adaptation to climate change discussions, dialogues, policy-making and institutions. In particular, this can be done by ensuring that women professionals and gender experts participate and provide substantive inputs in all decisions related to climate change. Women's participation can also be ensured by UNFCCC compliance with human rights frameworks, international and national commitments on gender equality and equity, including CEDAW (Committee on the Elimination of all forms of Discrimination Against Women) and CRC (Convention on the Rights of the Child). It will also be

important in the future to balance representation by gender in the delegation of parties in U.N. climate negotiations, UNFCCC and COP for instance (see graph below). Of equal importance is ensuring the integration of gender concepts, approaches, inclusion and equity in all phases and aspects of development funding for projects and programmes, from conceptualisation, design, implementation, gender budgeting, evaluation and reporting, supporting collective action and networking on gender and climate change, and ensuring the meaningful participation and substantive inputs of differently positioned women in customary institutions.

All of these issues and inequalities described above undermine their capacity to cope, adapt and increase their vulnerability to the negative effects of climate change. This especially emerges as a serious issue, with acute and problematic consequences, in the case for climate induced and related disasters brought on by too much too little water.







COPING WITH TOO MUCH AND TOO LITTLE WATER AND LINKS TO TRAFFICKING

Climate-related disasters – such as droughts, floods, landslides, cyclones, intense storms, glacial lake outbursts – severely affect the most vulnerable and resource poor communities, which depend on natural resources for their survival and livelihoods in the HKH. Women are particularly vulnerable during conflicts and any type of climate related disasters and hazards (ICIMOD, 2009). This vulnerability includes new forms of slavery and trafficking in times of disasters.

As numerous studies have demonstrated, women bear the disproportionate burden of the costs of disasters, if their rights are not ensured and if gender, socio-cultural and political-economic inequalities within the context of gender relations and institutions are not addressed (Mehta, 2007). When disasters hit, more women than men die because of lack of information, mobility, decision-making, access to resources and training, gender-based cultural norms and barriers, and high rates of male out-migration. For instance, a recent study that analysed disasters in 141 countries demonstrated that the gender gap in life expectancy (in most countries women outlive men, except for India, Nepal and Bangladesh) becomes narrower due to the higher mortality of women in disasters (Nuemayer and Plümper, 2007). Such studies bring our attention to the gender differentiated impacts of droughts and floods. Newly emerging analysis described further below points to the previously neglected consequences of climate change: women's increasing vulnerability to trafficking after climate-induced disasters.

As the evidence and case studies from the region indicate, women often suffer more of an impact than men in climate change related disasters. However, great care and caution must be taken to not link this relationship to biological differences between females and males (i.e. sex differences). Rather, this relationship is due to socially constructed differences between women and men (i.e. gender differences) attributable to social norms, roles, exclusions, discourses and power relations.



In other words, socio-cultural attitudes towards gender differences, not biological ones, create increased risks and vulnerabilities during situations of too much too little water. Hence, in order to reduce the risk of harm during such situations, it is important to emphasise the linkages between climate-related disasters, development and women's social marginalisation, lack of choice and skewed power relations (UNDP, 2011). Gender blind development processes and programmes can also place women at a disadvantage (ibid.), or worse, exacerbate gendered impacts and risks.

Disasters related to too much too little water affect women and men in different ways and to different degrees in varied contexts across the Hindu Kush-Himalayas (HKH). Therefore, an increase in the magnitude and frequency of natural disasters will also have different implications for men and women (CIDA, 2002). For example, extreme events may trigger out-migration from local communities and villages due to resource shortages (*ibid.*). Often, when livelihoods are destroyed and productive assets are eroded, men tend to migrate out in search of income generating opportunities. This in-turn intensifies women's workloads as they struggle to add the work that men used to manage to their own daily workloads (UNDP, 2011). Women's workloads are further intensified because of increased difficulties in accessing resources, in particular, fuel wood, food, fodder and water (CIDA, 2002). The effects of men's out-migration on women's autonomy and freedom of movement can also be complex. It can potentially lead to greater opportunities for women to step outside previously constrained gender roles, to take on new livelihood options, and increased functions in the public domain (UNDP, 2011; CIDA, 2002). In some cases, it can also lead to women's out-migration (*ibid.*, *ibid.*).

The negative impacts on women's workloads and livelihoods can be attributed to the existing gender division of labour, which are further exacerbated by changes in crop and livestock production, detrimental effects on both men's and women's incomes, and flooding and erosion in settlements on low-lying land and wetlands (CIDA, 2002). Women's usufruct rights to resources can also diminish or disappear as access to land natural resources dwindles and competition increases with climate change and related disasters (*ibid.*).

Although greater numbers of women reportedly die or are affected in most disasters in the HKH, this is not invariably the case in all contexts around the world. In other parts world, such as Latin America, more men or boys die because socially constructed roles promote greater risks due to risky behaviours or because men or boys are disconnected from society's protective mechanisms (UNDP, 2011). Thus, varied situations around the globe suggest that "women and girls are not inherently vulnerable; they are made so by inequitable social structures and gender-blind attitudes and behaviours" (*ibid.*, 9). As discussed further below, women and girls are more likely to become subject to trafficking and gender-based and sexual violence after a disaster. This is particularly true when members

of displaced households are living in overcrowded and under-resourced transitional housing where women lack privacy and protection provided by social networks (Brody *et al.*, 2008:7).

GENDER DIMENSIONS IN TOO LITTLE WATER – DROUGHT

There are not only differences between men and women in vulnerability to coping with climate change, there are differences in how women and men perceive and experience extreme events of too little water (ICIMOD, 2009a). Temperature rises may lead to too little water, soil moisture deficits, droughts, fire and possible pest outbreaks, which are believed to decrease crop yields in tropical, subtropical regions and many mid-latitude regions (Kasperson and Kasperson 2001, Regmi and Adikhari 2007). These may also lead to severe water scarcity leading to the extinction of biodiversity resources or the migration of species to higher elevations (Kasperson and Kasperson 2001, Brody *et al.* 2008).

Some challenges that women in particular may face when water resources are depleted include problems with sanitation, health, hygiene, and safety. They often have greater workloads with having to walk or travel long distances to access water for household consumption (drinking, cooking, childcare, washing, etc.). Women may also have to walk and travel further for productive work in agriculture, livestock rearing, etc. If women have to trek longer distances for potable water and fuel, there is even more strain on the mountain communities, women's work burdens (Ebi and Uma, no date; Mitchell *et al.*, 2007) and health related risks and problems. Moreover, when women must spend more time on productive and reproductive tasks, it limits their time that could be spent on income generation, alternative livelihood activities, training, education, participating in institutional and governing fora, engaging in social and developmental opportunities and maintaining their health. It reinforces already skewed customary gendered divisions of labour. Increased workloads for women also means that parents or guardians take girls out of school in order for them to carry out household and agricultural tasks (Baten and Khan, 2010; Brody *et al.*, 2008).

A recent ICIMOD study, on too much and too little water in the HKH, illustrates that women and men experience and perceive water stresses differently (ICIMOD, 2009a). In the hills of Sankhuwasabha in Nepal, shortages of water are becoming a



critical issue, but men tend to qualify the shortage as severe, whereas women tend to qualify the same problem as moderate. These differences highlight gendered priorities since men often consider water shortages for irrigation a serious problem, while many women consider sanitation and household water access and supply a serious problem. For women, water shortages create health issues and acute labour burdens because they are primarily responsible for collecting and carrying water from great distances in arduous mountain conditions. These differences in experience and perception relate to socially constructed gender divisions in labour, roles and responsibilities. They affect inter and intra-household decision-making and prioritisation, especially about appropriate types of solutions and investments in infrastructure in response to what differently positioned women and men perceive as the main problem.

Similarly, women and men perceive experiences of climate change differently in places affected by floods such as Assam and Bihar in India. During floods, men reported being concerned about generating an income, which frequently entails migrating away from their households and families for low paid casual labour. This situation conditions their perceptions of hardship. In contrast, many women reported being concerned with immediate household livelihoods and sustenance and believe that they suffer the most during floods. When men out-migrate, women's workloads increase disproportionately but their decision-making power remains marginal. These dynamics condition women's and men's perceptions of hardship differentially. These gender nuances in perceptions may also vary among women and men, when differences in caste, class, ethnicity, marital status, life cycle positioning, age and other factors and context-specificities are taken into account.

Drought also severely affects women, because it has an impact on their livestock and irrigation strategies, household water availability and the distances they must travel to harvest and carry water. Improved, culturally appropriate, gender-sensitive and demand-driven household water supply solutions can provide a crucial opportunity for extra income opportunities and time-saving for women, thus helping economically impoverished households to better bridge the dry season (Sijbesma *et al.*, 2009). Therefore, green technology inputs should factor into their design and support the immediate needs of women, including agricultural, irrigation, household use and livelihood needs, as well as social, cultural and gendered priorities and preferences.

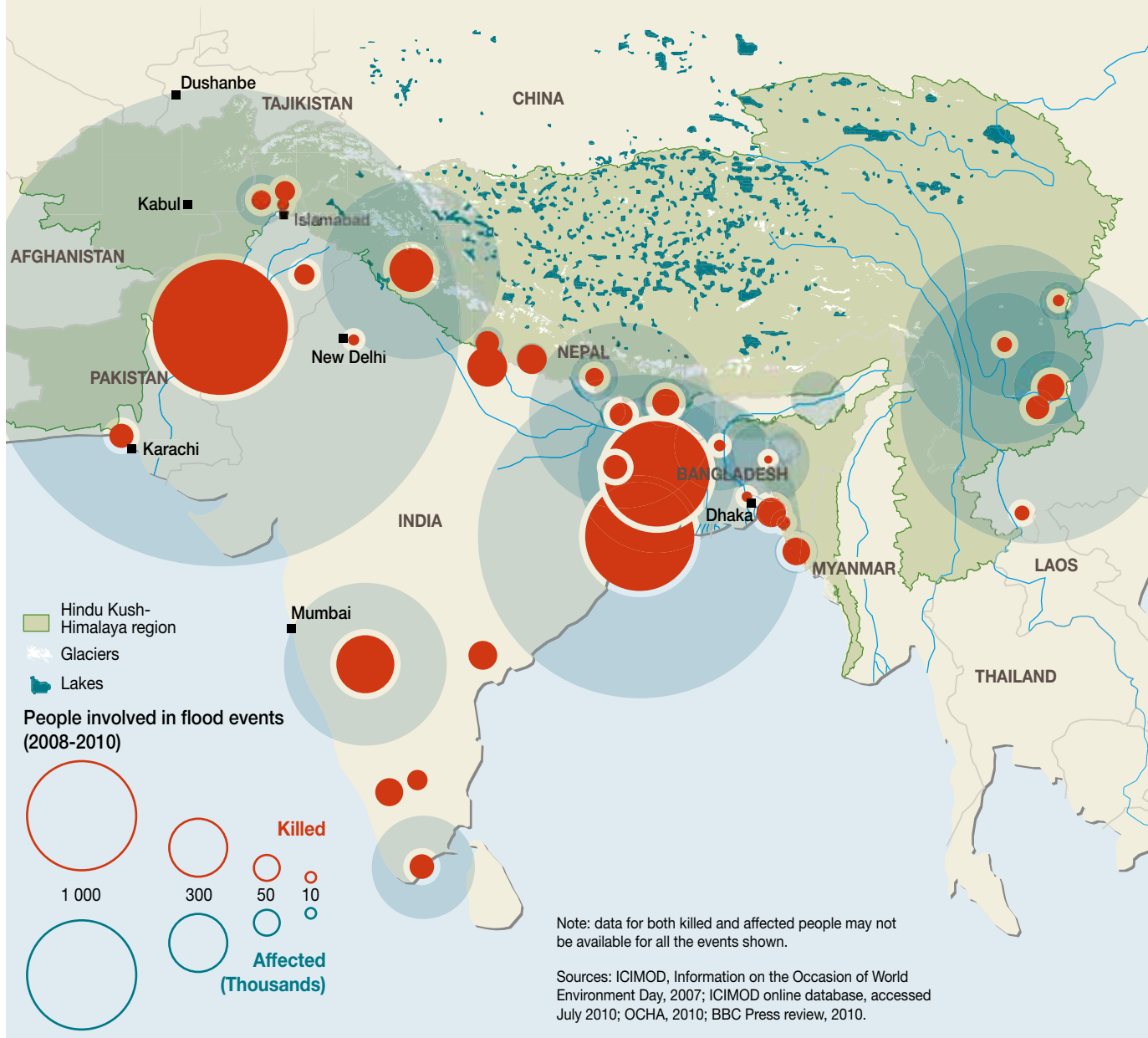
GENDER DIMENSIONS OF TOO MUCH WATER – FLOODS

Recent studies focus attention on the radically changed flood patterns, including heavy rainfall that leads to landslides and soil erosion. For example, in Nepal women and men have noted increased frequency and damage caused by the floods over a twenty-year time-span (Gautam *et al.*, (2007). During floods, rivers may cut into agricultural land, inundate crops or wash the fields away in their entirety. Economically poor and marginalised households are affected because they often only have access to

marginalised land, such as that which is close to rivers and more acutely prone to flooding. Many rural farmers depend solely on natural resources for their survival and therefore, changes in monsoon patterns have devastating effects on their livelihoods and agricultural and pastoral practices (ibid.). In Bangladesh, similar unpredictability and changing flood patterns have negative impacts on people, homes, stored food and grains, crops and assets (Dankelman *et al.*, 2008). Most drought-related impacts disproportionately affect women as compared to men. Hence, women in particular report not being able to recover from one flood event before the next one hits (ibid.).



Recent flood events in the Hindu Kush-Himalaya region









In the HKH region, floodwater and sand deposition decreases soil productivity and places more pressure on the remaining fertile land (Dankelman *et al.* 2008, Mitchell 2007, Regmi and Adikhari, 2007). Studies estimate that crop yields in Central and South Asia could fall by up to 30% by the mid-21st century, increasing the risk of hunger in many countries (IPCC, 2007). Sand, dead animals and human waste flowing in flooded rivers also drastically decrease access to safe drinking water. Hence, women have to spend more time to access, carry and purify water (Mitchell, 2007). When women's access to water

is limited, the whole household is affected because it depends on women to provide water for drinking, cooking, cleaning (Raworth, 2008), livestock rearing and subsistence agriculture.

In some places in South Asia, women are at greater risk than men of death from climate change related disasters because of pre-existing culturally constructed gender norms (Nelson *et al.*, 2002) and power relations. For instance, in the 1991 Bangladesh cyclone, about 59% of the tens of thousands of deaths were women (Begum, 1993). Among the 20 to 44 age



group in the flood affected area, 71 females per thousand died compared to 15 males per thousand (Mushtaque *et al.*, 1993 cited in Baden *et al.*, 1994). Gendered cultural norms relating to women's behaviour and identities, which limit their ability to make rapid decisions regarding mobility and freedom of movement, may when disasters hit, delay women from leaving their homes to seek refuge and safety until it is too late (Nelson *et al.*, 2002). Gender norms and ideas of men's masculinity and identity may also affect the behaviour of men in the post-disaster reconstruction and rescue period by sometimes

encouraging risky "heroic" actions and discouraging the seeking of counselling afterwards (Nelson *et al.*, 2002; Enarson, 2000).

Most critically, the aftermath of a disaster exacerbates existing gender inequalities and places acute pressure on women with their everyday workloads, besides creating the loss of household dwellings, security, safety nets and ruptures in social controls that regulate behaviour and norms within and between households (Bartlett, 2008). Other impacts on livelihoods also have gender dimensions. These include the loss of life, property, homesteads,

fertile land, fodder, crops, seeds, livestock, wage labour and income generating opportunities. These impacts limit access to sanitation, privacy, health care, storage, markets and inputs.

For instance, in South Asia and other parts of the world, skills such as swimming and tree climbing that help people to survive and cope better during floods, are socially acceptable and encouraged for boys but often discouraged for girls for cultural reasons. As already mentioned, cultural practices and norms for clothing can restrict women's ability to move quickly and hinder their ability to relocate from their households or communities without their spouses or family members. Often as a disaster develops in some contexts in the Hindu Kush-Himalayan region, women feel inhibited from evacuating from their homes until their husbands or elder men in the family or community specifically give permission. The men may be working away from the home and consequently may be too late to initiate evacuation procedures.

TRAFFICKING OF WOMEN AND INCREASED VULNERABILITY DURING DISASTERS

During disasters, another key impact and emerging issue is increased cases of trafficking. According to the United Nations, “trafficking in persons shall mean the recruitment, transportation, transfer, harbouring or receipt of persons, by means of the threat or use of force (...), for the purpose of exploitation” (Protocol to the UN Convention against Transnational Organised Crime, Palermo 2000). Statistics on criminal activities are, by their nature, difficult to obtain. Some of the trends described here are emerging in response to multiple drivers of change, so the following information is based largely on scientific references, information from NGOs actively working on these issues and information provided by the INTERPOL General Secretariat for this report.

While there is great uncertainty in the estimates, some projections suggest that 2 million to 4 million persons are trafficked within their home nations every year, and up to another 800,000 across borders (U.S. Department of State, 2004; Hodge and Lietz, 2007). Among those who are trafficked internationally, 70% to 80% are female, and of these, about 50% are girls (Curtol *et al.*, 2004; U.S. Department of State, 2004; Hodge and Lietz, 2007). Among all women, about 70% are trafficked for the sex trade and other forms of sexual exploitation. The remainder are mainly

trafficked for forced physical labour and a small proportion for other purposes, such as illicit organ trade (Curtol *et al.*, 2004; U.S. Department of State, 2004; Hodge and Lietz, 2007). This information gives indications that trafficking has grown substantially in the last two decades worldwide (Flowers, 2001; Kelly, 2005; Monzini, 2004).

Trafficking in human beings is a multibillion-dollar form of international organised crime, constituting a type of modern-day slavery. The International Labour Organisation estimates its value at USD 39 billion each year (INTERPOL, 2009). Using deception or coercion, traffickers recruit and transport victims between countries and regions. Victims are stripped of their autonomy, freedom of movement and choice and national identity. They face various forms of physical and mental abuse. Trafficking of human beings is a crime under international law and many national and regional legal systems. It is also a human rights violation, a violation against the rights of women and children under CRC (the Convention on the Rights of the Child) and CEDAW (Committee on the Elimination of Discrimination Against Women) and an heinous form of gender-based violence.

Women and children are at greatest risk and most susceptible to trafficking and exploitation in times of disasters (Hodge and Lietz, 2007). Natural disasters, such as earthquakes and tsunamis, and climate-related disasters, such as floods or famine crises, may disrupt local security and safety nets and increase levels of stress, family conflict and mental health issues. Therefore, they contribute to the neglect of children (Bartlett, 2008). “Overcrowding, chaotic conditions, lack of privacy and the collapse of regular routines can contribute to anger, frustration and violence”, with children (especially girls) and women being the most vulnerable individuals (*ibid.*:4). Women or children face a greater risk of becoming targets for exploitation, gender-based violence (*ibid.*) and human trafficking when they are unaccompanied, separated or orphaned, due to the erosion of social controls and protections that normally regulate the behaviour within households and communities.

Moreover, “when times are hard, children can become an asset that is drawn on to maintain the stability of the household. Children may be pulled from school to work or take care of siblings. Some children may be considered more ‘expendable’ than others” (*ibid.*:4). For example, many of Bombay's young sex workers are from economically poor rural villages in

Nepal, where inadequate crop yields and income generating opportunities force families to sacrifice one child at the expense of and in order for others to survive (ibid.:4). However, it is also worth noting that families are often not aware that their daughters will end up with traffickers, who falsely promise that the girls will have better lives, education and life opportunities.

After a climate-related disaster, economic and security challenges may lead women and children to seek better living conditions, shelter and safe housing, making them potential targets for gender-based violence, exploitation and human trafficking. The disasters that lead to increased physical and

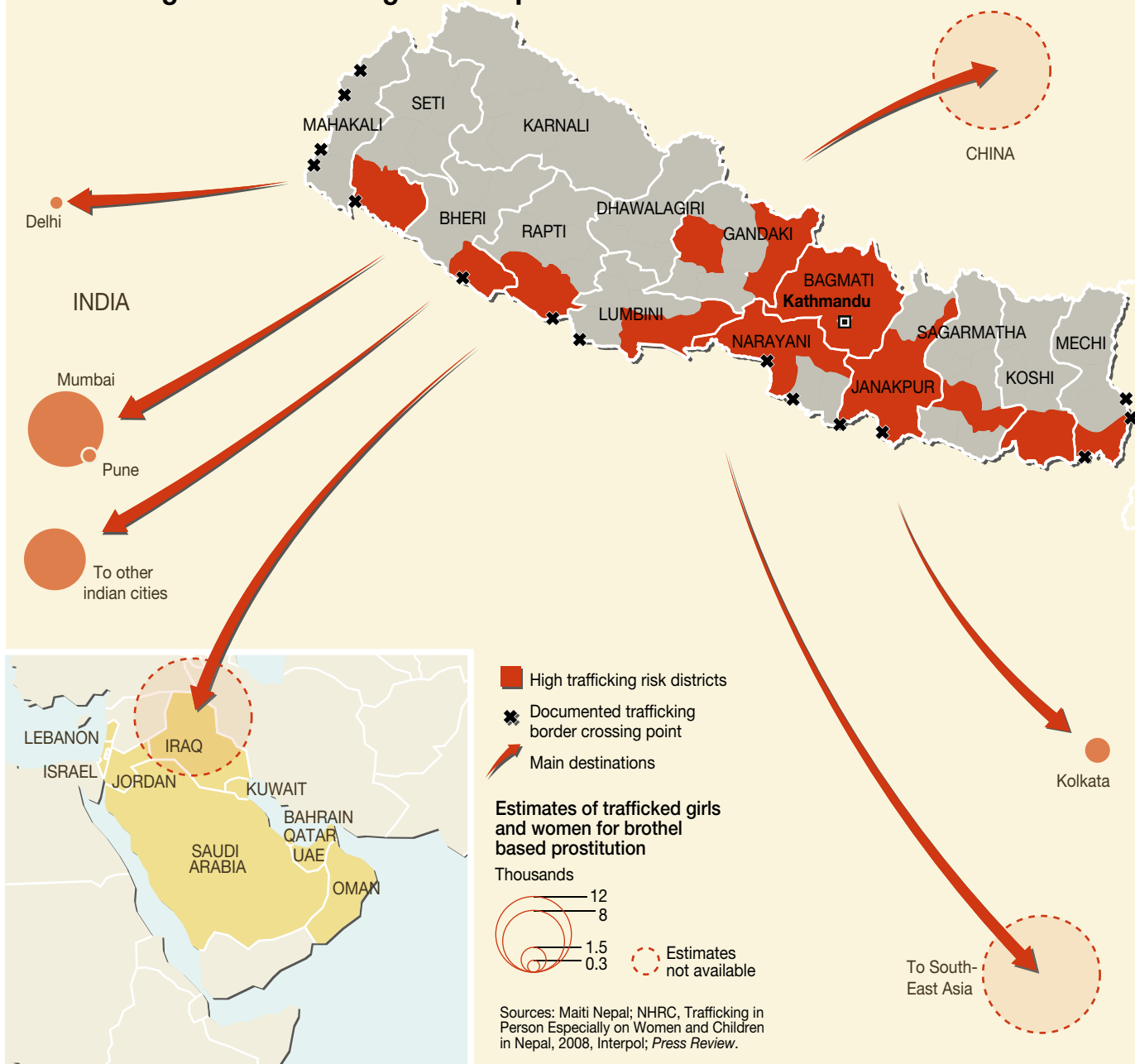
economic insecurity for the most vulnerable individuals in a society, namely women and children, are among push factors for human trafficking. Therefore, insecure disaster regions have to be considered as potential areas for human trafficking.

Trafficking has many forms but one consistent aspect is the abuse of the inherent vulnerability of the victims and violation of their fundamental human rights. Trafficking of women and children, including boys, is the prevalent form of trafficking and affects every region of the world, either as a source, transit or destination country. Women and children from developing countries and vulnerable groups of society in developed

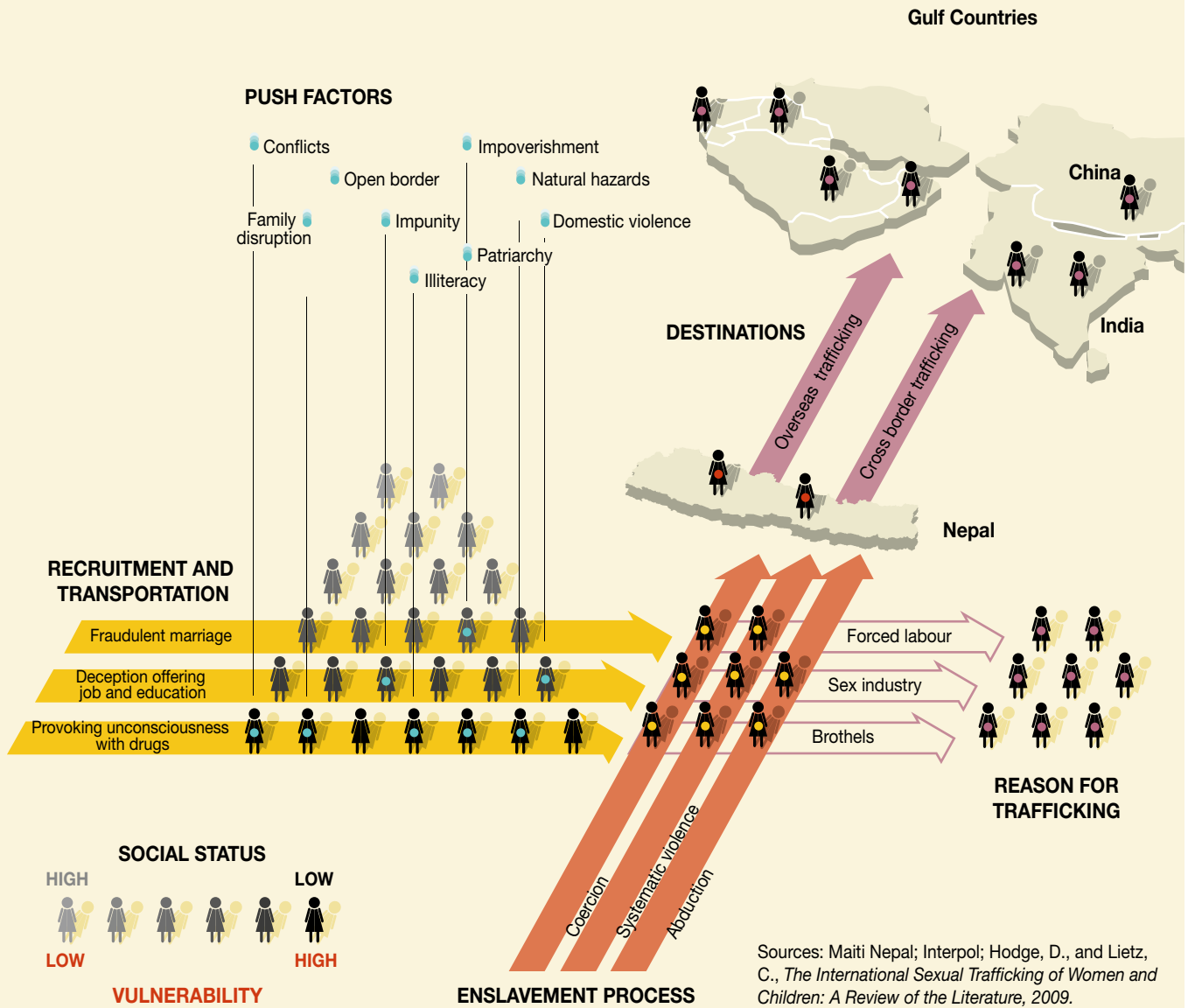


Human Trafficking In Nepal: A view from inside a brothel with the rooms on each side on November 15, 2005 in Siliguri, Utar Pradesh, India. Entire families live inside these brothels, the owners and the children of the prostitutes. There is no sanitation or any hygienic responsibilities.

Trafficking of women and girls in Nepal



Human trafficking in Nepal - Patterns



Sources: Maiti Nepal; Interpol; Hodge, D., and Lietz, C., *The International Sexual Trafficking of Women and Children: A Review of the Literature, 2009.*

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countries, are lured by false promises of remunerated employment - made directly to them or to their parents, guardians and relatives - into leaving their homes and travelling to what they assume will be a better life. An organised network provides victims with false travel documents and transports them to the destination country, where they find themselves forced into sexual slavery, held against their will in inhumane conditions, in constant fear of their lives and wellbeing, and suffering psychological trauma.

As a result of trafficking, many women, girls and boys fall victims to forced labour in sectors such as agriculture, primarily in developing countries. Women and children are recruited and trafficked using deception and coercion, and find themselves in a variety of forced work engaged in agricultural and construction work, domestic servitude and other labour-intensive jobs. They live in appalling conditions of slavery, abuse and sexual and gender-based violence, often without due remuneration, freedom of movement or options to report to authorities or escape from such exploitative conditions.

The commercial sexual exploitation of children in tourism has been apparent in Asia for many years and has now taken hold in Africa and Central and South America. The phenomenon is promoted by the growth of inexpensive air travel and the relatively low risk in these destinations of prohibition and prosecution for engaging in sexual relations with minors. As noted above, disasters will heighten this risk for vulnerable individuals by disrupting normative social and cultural codes of conduct, behaviour, policing and prosecution.

DYNAMICS OF TRAFFICKING OF WOMEN IN THE HINDU KUSH-HIMALAYAS

Indeed, some estimates from Maiti Nepal¹ suggest that trafficking from Nepal may have increased from an estimated 3-5,000 per year during the pre-war times (1990) to possibly 12-20,000 per year in 2010. This includes internal and external trafficking. Internal trafficking increased extensively during and after the ten years of armed conflict in Nepal, though great uncertainty exists about such estimates.

1. Maiti Nepal is an internationally recognised and acclaimed NGO working against human trafficking and towards the protection and rehabilitation of victims of trafficking from Nepal (<http://www.maitinepal.org/>).

Maiti Nepal rescues an estimated 2,000 thousand girls each year, including children and women intercepted at borders and victims liberated from brothels and from various forms of abuse and exploitation. It provides them with education, protection and rehabilitation. Current estimates are that Maiti Nepal receives over 4,000 thousand reports of missing young women suspected of being abducted every year. The majority, an estimated 70%, are sold and forced into prostitution; the remaining 30% are sold for forced labour. Foreign destinations of the missing women include India, China, the Gulf and the Middle East.

The greatest number of missing women are trafficked to Mumbai, India, where 38% of such girls and women (average age 16 years) are found to be infected with HIV/AIDS (Silverman *et al.*, 2007; Gupta *et al.*, 2008). Across the South Asian region, up to 40% of prostituted women and girls enter the sex trade prior to age 18, that is, as children (Silverman, 2011). Although estimates of HIV/AIDS prevalence among prostitutes in South Asia vary widely from 12-54% (Brahme *et al.*, 2006; Sarkar *et al.*, 2008), studies consistently document that those women and girls who entered the sex trade as minors are at a significantly greater risk for both HIV/AIDS infection and victimisation by violence (Silverman, 2011). Violence from men clients and clients refusing to wear condoms is common. For instance, in Thailand, 15% of women in prostitution report experiencing violence on a weekly basis and 72% of these women report that their male clients had refused to have sex with a condom (Decker *et al.*, 2010).

Importantly, these risks may be most extreme among the youngest victims. Among sex trafficked women and girls in Nepal, over 60% of girls trafficked prior to the age of 15 years were found to be infected with HIV/AIDS, four times the rate of infection experienced among those trafficked at 18 years or older (Silverman, 2007). Violence is often directed against those who are vulnerable because of their young age; in southern India, 1 in 3 women and girls 19 years old or younger report having been raped or beaten in the past year (Beattie *et al.*, 2010).

Girls forced into the sex trade before the age of 15 are also significantly more likely to be moved from brothel to brothel than older trafficking victims (Silverman *et al.*, 2007). The youngest girls in the sex trade also report having significantly higher numbers of forced sex partners than their older peers (Sarkar *et al.*, 2008). Not surprisingly, each additional month



that a girl is trapped in sex work equates to an additional 3-4% greater risk of HIV/AIDS infection (Silverman *et al.*, 2006). This further demonstrates the need to intervene in sex trafficking as early as possible.

Another key problem is that because women comprise the primary work force in agriculture, young girls are taken out of school to work in agricultural fields during droughts. The phenomenon is also documented in other parts of the world including Africa (Campbell, 2009). Hence, floods, droughts

or other dramatic climatic events may disrupt families, expose young women and children in particular to malnutrition and other health associated risks (Goudet *et al.*, 2011), and increase the exposure of women and girls to trafficking, slavery and forced work. Young women and children, including boys, are sold, coerced, kidnapped or sent away for forced agricultural and household labour. One case of such coercion, involving several young girls in a remote and inaccessible mountain village, was documented in the fieldwork undertaken in compiling this report.



WOMEN ADAPTING TO CLIMATE CHANGE

Adapting to climate change will require a broad range of efforts, incentives, resources, commitment and active interventions throughout most parts of society. Women should be at the centre of adaptation programmes because they are a particularly vulnerable group because of limited access, control and ownership over resources, unequal participation in decision and policy making, lower incomes and levels of formal education, and extraordinarily high workloads. On the other hand, women need to be at the heart of adaptation efforts because of the significant roles they play in agriculture, food security, household livelihoods and labour productivity. Within these critical roles, women have valuable knowledge, skills and agency in managing natural resources and are often at the front-line of adaptation to climate change in the context of high rates of men's out-migration. Thus, women provide a central opportunity for promoting sustainable mountain development.

Furthermore, adaptation efforts will also have to address the full range of challenges and opportunities related to gender inequities, including cultural, economic, social, political, health and environmental issues. The latter factors are very relevant to resilience and adaptive capacity (UNEP, 2009; 2010). Among the critical factors that can assist in gender sensitive adaptation are increased access and ownership of land, micro-credit directed to women, water, livestock, storage facilities, agricultural inputs, markets, education and green technology. These must all be culturally appropriate, socially acceptable, responsive and practical for women's needs (Devendra and Chantalakhana, 2002; Hussain, 2007; UNEP, 2009; 2010; Shackleton *et al.*, 2010; Sijbesma *et al.*, 2009). It is critically important to spend the time necessary to factor into development research and action the approaches that focus on women's demands, concerns, experiences, priorities and needs. Women who take part in action-oriented research often have a clear sense of what they need to adapt better to changes in their environments, climate and livelihoods (Mitchell *et al.*, 2007). Moreover, innovative strategies need to be grounded in mountain and culturally specific realities, needs and aspirations (Khadka *et al.*, forthcoming).



According to a recent report on gender and adaptation to climate change, women “have been experiencing changes to the weather that have affected their lives, and are adapting their practices in order to secure their livelihoods. They might not be aware of all the possible adaptation strategies, of all the ways to overcome

constraints to the ones they are using, but they certainly know their present situation best and have an urgent list of priorities to secure a livelihood in the face of the new challenges” (Mitchell *et al.*, 2007:14). For instance, these needs include initiatives,

trainings and exposure exchange visits on appropriate and culturally specific crop diversification, adaptive agricultural practices, post-harvesting approaches, innovations in animal husbandry and alternative livelihood practices).



To reduce the vulnerability of women, and increase the capacity of society as a whole to adapt to a changing climate, women will have to be central in the coming decades if sustainable adaptation strategies are to be implemented.

Gender-sensitive responses will require more than the collection of disaggregated data illustrating differential impacts on women and men (if available). They will require an in-depth understanding and rigorous analysis of existing inequalities





and gender power relations between differently positioned women and men, and of the ways in which climate change exacerbates these inequalities and relations (Brody *et al.*, 2008; Verma, 2001). For these reasons, it is important that women actively and equitably participate in policy and decision-making processes within their household, community and national and international institutions (both customary and statutory), so that their knowledge, contributions, agency and work are valued and their capacities, confidence and voice are boosted and enhanced.

One important lesson in advancing gender issues and analysis is the importance and critical difference between gender awareness, gender promotion and gender analysis. Not all the same actors, approaches and methods may be involved in creating greater awareness of the importance of gender and climate change adaptation issues, actively promoting it, or scientifically and systematically analysing the differentiated impacts, resilience and adaptation strategies of women and men (Verma, 2001). Gender awareness and advancement



of gender issues and equity is needed from actors from all different disciplines, institutions, organisations and contexts.

However, gender analysis requires rigorous, in-depth technical skills of analysis, as in any other field. As well, efforts must be made to ensure rigour, depth and further strengthening of technical capacity in this emerging field. In-depth gender analysis cannot be a mere ‘add-on’, a box to check off, or a rapid method of “doing gender” – not if it is to accurately reflect

women’s and men’s complex gender realities in the face of climate change (ibid.). At the same time, gender awareness and promotion is critically valuable for political and environmental action, for creating gender-positive action that makes a difference, for challenging gender-biased and blind discourses and inequities, and for changing research and development agendas in gender-positive directions.

Finally, it is also worth remembering that women are not a homogenous category, that they are differentiated by age,

class, caste, marital status, life-cycle positioning, ethnicity, profession, etc., in ways that affect, shape and magnify or reduce their vulnerabilities, risks and coping strategies. For instance, women are more acutely vulnerable to climate change because of limited access to resources and decision-making power if they are of lower caste, poorer economic class, heads of households (both *de jure* and *de facto*), younger in early stages of marriage, and young girls in times of disasters and economic crisis, etc. Women of lower castes are sometimes disadvantaged in terms of status, have limited access, control and ownership of resources, and are excluded from decision-making at community level and disaster preparedness planning (Leduc and Shrestha, 2008). Women and young girls forced to migrate are also exposed to multiple vulnerabilities, including the risk of rape and trafficking (discussed earlier). Women and men tend to perceive different risks as important and attribute different meanings to material realities and environmental changes (Moore, 1993) and the experiences they face due to socially constructed roles, responsibilities and identities.

“Women play very crucial role in climate change adaptation and mitigation, even though their contribution is overlooked or less acknowledged. Many of their works related to natural resources management are contributing to mitigation actions. Whereas, women perform many activities for the well being of their family members, which simultaneously can be regarded as well designed adaptation practices. Women adopt diverse and intense household resource-use strategies to cope with food deficit situations, especially during lean seasons and natural disasters. They intensify their efforts in homestead production and seek non-farm production options for the well-being of the family. Moreover, women perform some infrastructural development to conserve the soil and water and also to avoid floods by building embankments which presumably make a large contribution to the efforts required to confront climate risks.” (Baten and Khan, 8:2010)

Women are often the managers of natural resources with knowledge and skills that are critical for sustaining the environment. They are at the frontline of coping and adapting to climate and other critical drivers of change. Although they are often excluded and under-represented in decision-making institutions and policy processes regarding climate change, women are active agents who have developed locally adapted, appropriate and sustainable coping strategies and responses within the scope of limited access to resources and disadvantageous gender power relations.

Given that both vulnerability and climate change are socially constructed, contested and gendered concepts (Denton, 2002) and are further shaped by discourses that often “suspend” and ignore gender issues, it is important to “dig down and pull up the deep roots of the discourses that frame gender and climate politics” (MacGregor, 2010:236). In this regard, it is also critical to highlight the ways in which certain concepts of knowledge, culture and power relations will shape institutional discourses, ideologies and practices of development and the everyday practices of women and men to manage their environments and natural resources (German *et al.* 2010).

Imagine what is possible if climate change policies and initiatives actively address dominant and often gender blind discourses and the power relations that shape much of gender inequality throughout the world. Envision the possibilities if we actively work against the gender “evaporation” that more often than not tends to take place when we attempt to gender “mainstream” or integrate gender issues in the face of limited resources, political will, commitment and systematic approaches (Verma, forthcoming). Imagine what is possible if women are given due recognition and are included in development and policy processes as strategically important development actors in their own right.

There is little doubt that women as agents and adaptors to climate change are key to sustainable adaptation in mountain regions. To reduce the vulnerability of women and increase the capacity of society as a whole to adapt to a changing climate, women must be central in sustainable adaptation strategies to be implemented in the coming decades, and if valuable context-specific adaptation strategies are to be given the chance they deserve to provide hope for the future.





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