



## **United Nations Development Fund for Women's contribution to request by UN High Commissioner for Human Rights for information on human rights and climate change**

*Climate change is not only an environmental issue; it has clear economic and social consequences. ... The effects of climate change will have a disproportionately severe impact on the poorest and most vulnerable of the world's communities, and they threaten to put the Millennium Development Goals beyond reach unless action is taken now.*

-UN Secretary-General Ban Ki-moon, Background note for High-level event on Climate Change (24 September 2007)<sup>1</sup>

### **Anticipated asymmetrical affects of climate change on vulnerable populations**

Over the next century, the projected rise in average global temperature and sea levels is expected to have various foreseeable and unexpected impacts on the environment. In brief, these include (1) more frequent and intense natural disasters, including recently acknowledged glacial lake bursts; (2) diminishing fresh water due to rapid glacial melt, droughts, desertification and increased salinity of fresh water sources due to seawater intrusion into coastal aquifers; (3) increased scarcity and degradation of some natural resources and arable land; (4) loss of biodiversity, and; (5) relocation or spread of species and diseases. Combined or in isolation, these circumstances will be challenging for individuals, communities, and states.

Inevitably, humans will be asymmetrically affected by these changes in the earth's atmosphere and ecosystems, as some communities and persons are recognized as more vulnerable than others.<sup>2</sup> The ability of *countries* to cope with these challenges differs, for example, based on their technological, economic, and governing capacity. Within these states, the capacity of *individuals and communities* to cope will also differ, dependant on their occupation, wealth, age, health, citizenship status, social/ethnic group and gender.

The gender dimension of climate change, in particular, is gaining visibility as the stakes of climate change become increasingly clear. As in other social, political and economic arenas, embedded gendered differences—including traditional divisions of labour,

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<sup>1</sup> UN Secretary-General, Background note for High-level event on Climate Change (24 September 2007); *The future in our hands: addressing the leadership challenge of climate change*, 27 August 2007.

<sup>2</sup> The definition of vulnerability, presented by Wisner et al. is used here. Vulnerability is "the characteristics of a person or group and their situation influencing their capacity to anticipate, cope with, resist and recover from the impact of a natural disaster." Wisner, B. P. Blaikie, T. Cannon, and I. Davis. 1994 and 2004. *At risk: Natural hazards, people's vulnerability and disasters*. First and second edition. London: Routledge.

resources and power—directly impact women’s political voice, economic opportunity, health, education, and access to information. Gender inequality, in particular, impacts every aspect of women’s lives, including those related to climate change. Legal and informal barriers to resources and equality, for example, exacerbate women’s vulnerability to adverse effects of global warming and marginalize their contributions to climate-related decision-making processes. Denied access to property, employment, fair wages, or representation within government, in particular, limit the means by which women can ensure their own economic resiliency and contribute to appropriate adaptation policies by local and national governing bodies.

Poor and elderly women, and girls are especially vulnerable—most notably in the following states and communities: *Developing states*, which are expected to bear the brunt of climate change as they have less capacity (technological, infrastructural and financial) to cope with the challenges; *Areas at high-risk of natural disasters* including island states and those communities along coasts, in deltas, in hilly or mountainous regions with unstable soils, downstream from rapidly melting glaciers, and populations in or on the edge of deserts; *Agricultural communities* dependent on geo-hydrological cycles or ‘natural’ watering for crop production; *Communities dependent on marine life for sustenance and livelihood*—from large-scale fishing industries to small, remote indigenous populations; *Communities dependent on forest resources*—from large-scale timber harvesting to eco-tourism and indigenous populations dependent on the forest’s natural resources; *Rural communities*, which are projected to be more vulnerable than urban centers, as they are more dependent on renewable natural resources for subsistence and livelihoods, and are farther from services that provide opportunities and assistance. (Annex 1 describes these circumstances in more detail.)

The following examples, while not exhaustive, illustrate fundamental ways in which gender inequalities can increase the vulnerability of women when coping with natural disasters and environmental stresses of climate change, within these broader communities mentioned above:

Gender dimensions of *natural disasters*:

- Access to public information on forecasted natural disasters and related relief services can be inhibited by women’s illiteracy or lack of access to the transmittal routes for information (public forums, government facilities, newspapers, radio, TV, etc.) for social, political or economic reasons;
- Private and undervalued spaces (such as homes, markets, schools, etc.) are often the last to receive infrastructure support in areas which are identified as high-risk for natural disasters, yet these are spaces where women are traditionally over-represented and therefore more vulnerable to infrastructure failure;
- Women may be less able or willing to migrate or move to safer areas (inland or to urban areas) due to financial limitations or responsibilities as primary care-givers for children and elders;
- Clothing, public shame, or lack of skills such as swimming and climbing trees, contributes to the death rate of women—especially when compared to men—in

- typhoons, tsunamis and floods, as they inhibit running, climbing and swimming, and increase drowning rates;
- Climate-related disasters have a greater negative effect on household food security in female-headed households—the group constituting the greatest percentage of the poor.<sup>3</sup>
  - Damage to infrastructure that limits clean water, hygienic care, and health services can be especially detrimental to pregnant or nursing women (10-15 percent of all women at any given time)<sup>4</sup> as they have unique nutritional and health needs;
  - Low body weights and anemia plague many women in developing states and increase their susceptibility to poor health and diseases post natural disaster;

Gender dimensions of *environmental stress*:

- Rural women are often dependant on the natural environment for their livelihood. Maintenance of households and women's livelihoods are, therefore, directly impacted by degradation or scarcity of natural resources;
- Limited rights or access to arable land further limits livelihood options and exacerbates financial strain on women, especially in female-headed households;
- Poor women are less able to purchase technology to adapt to climate change (e.g. watering technology, farming implements, climate appropriate and resilient seed varieties, and fertilizers);
- Public and familial distribution of food may be determined by gender, making women and girls more susceptible to poor nutrition, disease and famine, especially when communities are under environmental stress;
- Increased distance and time to collect water (due to drought, desertification or increased salinity) and fuel (due to deforestation or extensive forest kill from disease infestations) decreases time that women can spend on education or other economic and political enterprises, and in areas of conflict or instability, place them at increased risk of gender-based violence.

Gender dimensions of climate change, such as the examples above, directly impact women's well-being and, at times, survival. Increasingly reliable scientific evidence and a deepening understanding of the particular impact climate change will have on vulnerable populations has propelled political will and increased demand that climate change be addressed, as necessary and appropriate, by all members of the international community.

While UNIFEM's mandate does not *directly* address climate change, three of UNIFEM's strategic areas—reducing feminized poverty, achieving gender equality in democratic governance, and ending violence against women—contribute to the achievement of gender equality and women's empowerment, and help advance the security of women's

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<sup>3</sup> Pro-Poor Climate Adaptation, Norwegian development cooperation and climate change adaptation: An assessment of issues, strategies and potential entry points. Center for International Climate and Environmental Research, Report commissioned by NORAD, Norwegian Agency for Development Cooperation, November 2003, p 27.

<sup>4</sup> *Maternal Mortality in 2005*, WHO, UNICEF, UNFPA, and World Bank; [www.unfpa.org/publications/detail.cfm?](http://www.unfpa.org/publications/detail.cfm?)

human rights in relationship to many global challenges including achievement of the Millennium Development Goals and, contingently, gender-dimensions of climate change.

In particular, programming to end feminized poverty contributes to the diversification of economies and builds the resiliency of women, their households, and their communities against many economic challenges—including projected challenges of global warming. By advancing gender equality in the political sphere, as well, UNIFEM is increasing the likelihood that gender is considered in decision-making processes, policies, and the utilization of resources (financial, technical, environmental, etc.)—all venues through which climate change dialogue and policies are being developed and implemented at the local and national levels. In short, advancing women’s empowerment and gender equality strengthens individuals and communities, and enhances their capacity to respond to the challenges of climate change.

### **Good practices to advance gender equality and the resiliency of populations to adverse affects of climate change**

The following are good practices identified via UNIFEM’s catalytic and innovative programming, which foster women’s economic and political equality and thus strengthen their households’ and communities’ resiliency to social and economic challenges. These good practices include support to (1) increase the capacity of local and national governments to utilize gender responsive budgeting, (2) mainstream gender in poverty reduction and national development strategies, (3) ensure women’s legal rights to land, water, property, inheritance, and other assets, (4) achieve gender equality in democratic governance, (5) end violence against women, and (6) advance national, regional and local efforts to disaggregate data collection and data analysis by sex.

(1) Gender responsive budgeting (GRB) is a tool to help ensure that national planning, budgeting, and monitoring and evaluation processes incorporate a gender perspective and reflect countries’ gender equality commitments.<sup>5</sup> GRB is not about securing separate funds for women; rather it aims to ensure that public expenditures and services provided by Governments meet the needs of individuals that belong to different social groups, including women and girls. To this is end, GRB initiatives comprise of, amongst other activities, monitoring public expenditures to determine how and which resources are reaching women and men, and identifying gaps between intended and real impacts of public policies. Throughout the world, GRB is increasingly recognized as an effective tool for securing accountability to women’s rights and achieving desirable gender equality outcomes at the national, sectoral and local level. It has, therefore, strong potential to support emerging efforts by Governments that seek to address the challenges of climate change, and could ensure that gender-dimensions are incorporated in related budgets.<sup>6</sup>

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<sup>5</sup> UNIFEM has supported GRB initiatives in over 40 countries at national, sectoral and local level since 2000 and achieved concrete results in transforming policy, building capacity, generating knowledge and increasing women’s access to services and overall accountability to gender equality.

<sup>6</sup> The applicability of GRB to climate change has yet to be fully explored and articulated. Currently, there is evidence of its applicability in formal functioning institutions and in conflict, post conflict and crisis situations.

At the national level, GRB initiatives generally entail engaging with the formulation, execution and review processes of national development plans, including Poverty Reduction Strategy Papers (PRSPs), economic frameworks, public finance management systems, and aid policies to improve their responsiveness to women's priorities. Increasingly, these priorities will reflect needs emerging from the impact of climate change, such as securing the safety of women during natural disasters and environmental crises, increasing the economic resiliency of female-headed households, and ensuring equal access to resources that mitigate the adverse effects of climate change. Equitable development programmes and agricultural subsidies, in particular, that provide women equal access to training and support for irrigation, equipment, farm insurance, seed varieties, fertilizers, technical guidance, and treatment for plant diseases and pests, will be increasingly important to enhance food security. As part of efforts to respond to these needs, the application of gender responsive budgeting to sectors such as agriculture, energy, environment, health, rural development, social welfare, water, disaster relief, and other climate relevant departments could ensure that women's unique concerns in the context of climate change are adequately addressed.

At the local level, gender responsive budgeting has proven effective in promoting inclusive and participatory planning, execution, and monitoring of local budgets, and thus fostering more accurate assessments and responses to women's needs in local communities. For this reason, as well as the clear lines of accountability between local Governments and their constituencies, GRB could be a particularly useful tool to ensure that policies and budgets around climate change meet the needs of women on the ground.

(2) Mainstreaming gender in countries' poverty reduction and development strategies, as well as in the United Nation's approach to development assistance (via CCA/UNDAFs)<sup>7</sup>, advances international and Government commitments to gender equality.<sup>8</sup> This requires the formulation, implementation and monitoring of gender-sensitive programmes and policies, and often involves facilitating stakeholders to align national commitments with the Millennium Development Goals, the Convention on the Elimination of all Forms of Discrimination against Women, and the Beijing Platform, and developing a consolidated set of priorities and indicators.

An inclusive strategy in these processes is especially productive. It increases the opportunity for gender equality advocates to voice the needs of women on the ground, helps secure increased budget allocations to advance gender equality, and increases accountability in poverty reduction and national development strategy processes. Results of mainstreaming gender in these processes include, inter alia, equal access for men and women to economic resources, support to female entrepreneurship, professional training to women farmers and women farming cooperatives, and higher education quotas for rural girls and boys. This strategy may be further utilized to more directly address

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<sup>7</sup> UN Common Country Assessment and UN Development Assistance Framework

<sup>8</sup> From 2004-2007, UNIFEM supported efforts related to poverty reduction strategies and national development strategies in Africa, Asia, Central and Eastern Europe, the Commonwealth of Independent States and the Caribbean—19 efforts in 2004, 18 efforts in 2005 and 2006 and 33 in 2007.

specific gender-dimensions of climate change. For example, while disaster and risk reduction (DRR) has been increasingly mainstreamed into CCA and UNDAF approaches, ensuring that DRR strategies not only have a human rights-based approach but are gender responsive can go a long way to reducing a population's vulnerability to disaster and adverse effects of climate change.

(3) Women's legal rights to land, water, property, housing and inheritance are critical aspects of social and economic equality, and an implicit part of achieving the first Millennium Development Goal on eradicating extreme poverty, as well as the third, on promoting gender equality. In addition to enhancing social and economic security, access to these assets provide incentives for economic ventures that can lead to significant returns and bolster women's economic status. On the other hand, limited access to these assets—restricted by tradition and at times formal laws—denies women their rights, deepens their poverty, and makes them more vulnerable in times of crisis. They become more susceptible to social ills and economic dependency, may have a limited say in household decision-making, be more susceptible to gender-based violence, and will have limited recourse to cushion crises such as conflict, economic downturns, natural disasters and environmental stress. Evidence has revealed, for example, that registration of land and property titles in both spousal names is essential for women to provide for themselves and their families in times of peace and stability, but are especially critical post-natural disaster and in circumstances whereby women remain as head of households as widows or as sole care-takers after men emigrate.

As imperative to the advancement of women's equality, is access to safe water—a resource at risk of increasing degradation and scarcity due to the effects of climate change. Women are most often responsible for domestic and community water management in developing societies, determining sources, quantity and hygienic quality. Beyond traditional household use, women—particularly poor women—also use water for productive purposes, such as for domestic small-scale industries and micro-businesses. Furthermore, poor women often travel great distances to obtain water, thus limiting time spent on income-earning activities, education, acquiring other life-skills, political participation, or providing food for their family. For all persons, accessible safe water is critical for nutritional health. Unsafe or unaffordable water compromises hygiene, and leads to increased risk of transmitting or contracting diseases, high rates of infant mortality, and shorter life expectancies. Nonetheless, women are often obliged to accept lower-quality water, when access to safe water is restricted due to distance, time constraints, economic factors or civil conflict.

Climate change further threatens this access. In rural areas, access to water will be increasingly threatened by drought, shifts in rainfall patterns, and contamination due to increasing salinity of potable water sources. In urban areas, burgeoning urbanization due to increased emigration from rural and environmentally stressed areas, and the ensuing strain on states to provide basic services—housing and water in particular—threatens women's access as well, and is expected to exacerbate poverty unless these circumstances are anticipated and mitigated. Already, vulnerable populations in urban areas have been found to pay a significantly greater proportion of their incomes—at times

between 10 and 15 times more—than less vulnerable populations for water. While age and gender have been found to place individuals at high risk, female-headed households—especially those headed by older women—and unemployed or self-employed women, are often at the highest risk of pricing and access discrimination.<sup>9</sup> These exogenous determinants of at-risk populations, however, provide space for successful intervention. Poverty Reduction Strategies and other national development plans, for example, can address water and sanitation allocation and distribution, including the formulation of gender equitable policies, and sufficient assessment tools to monitor equitable access these resources.

Finally, migration for political, religious and, most recently, economic reasons has notably increased over the last sixty years. This already burgeoning trend is expected to expand further due to the challenges climate change place on vulnerable communities. Desertification, sea level rise, loss of arable land and even conflict over access to resources are expected to add environmental refugees to already well-worn migration corridors. UNIFEM's work with female migrant workers provides useful strategies to help protect the rights of migrants, especially women who are at increased risk of exploitation. It has focused on incorporating protection of and support to migrants in national poverty reduction strategies, strengthening women migrants' organizations, and brokering exchanges between source and destination countries to advance labour rights.

(4) Gender equality in democratic governance—participation of women and men on an equal basis—ensures that everyone has the opportunity to voice their needs, interests, and solutions to issues that affect their lives. Political empowerment, inclusion of women in decision-making processes, and accountability to these commitments are especially imperative to protect and advance their rights in circumstances surrounding climate change.

Women's vulnerability in both environmental crises and natural disasters due to discrimination, inequality, and inhibiting gender roles, demand that gender considerations be integrated into disaster risk reduction interventions and post-disaster efforts in particular; the most oft-cited examples being that early-warning information be provided in a manner accessible to all sectors of society, regardless of their literacy, socio-economic status, or access to public forums, and that skills such as swimming and tree-climbing be unselectively taught to both sexes to increase chances of survival during floods and cyclones. Formulation and implementation of programmes and policies that foster such initiatives, however, require increased capacity and percentage of persons with gender expertise in decision-making bodies and processes.

Women with increased proximity to and knowledge of the issues which render them and their communities more vulnerable to environmental and climate-related crises are an

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<sup>9</sup> A case study commissioned by UNIFEM of residents in Cochabamba, Bolivia, determined the vulnerability of populations based on gender, income, age, formal education, home/property ownership, and type of employment, and revealed that while recipients of piped-in water, provided via the municipal water network, paid 1 percent of their family income for water, those in poorer neighborhoods and dependent on alternative means to obtain water such as well-digging and delivery by tanker paid 10-15 percent of their family income for water.

indispensable resource of knowledge in this regard. Through inclusive processes, women have provided valuable insight into highly useful adaptive strategies to cope with environmental degradation. Women have also been highly resourceful, post natural disaster, contributing to effective relief, recovery and reconstruction strategies. As an example, UNIFEM's programme in Sri Lankan communities affected by the 2004 tsunami worked with local women's organizations to provide unique support for affected women, as the dire circumstances compelled the dissolution of traditional gender roles. Initiatives supported women to increase their marketability and upgrade production skills in non-traditional fields, such as masonry and carpentry, as well as more traditional ones, such as teachers, counsellors and health workers. Simultaneously, these efforts contributed to the rebuilding of their communities.

In short, inclusive processes help ensure that the unique circumstances of women are considered and responded to, provide opportunities for innovative solutions, and contribute to locally appropriate, equitable, and therefore effective responses to the challenges of climate change. This strategy, however, necessitates gender equality in governance and decision-making processes.<sup>10</sup> To this end, gender equality advocates continue to press for removal of discriminatory provisions of existing laws, the alignment of laws with provisions outlined in international and regional normative instruments, including International human rights instruments, such as the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), and strengthened capacity of states and institutions to implement these laws and policies.

(5) As in conflict and other times of severe social strife, women are at increased risk of gender-based violence due to an absence of rule of law—such as can occur in the aftermath of natural disasters, as well as through increased corruption in light of resource scarcity. The currency of corruption and chaos that women often pay translates into sexual exploitation and violence. There are strategies, however, to combat this risk. Violence against women is less likely to occur in communities where awareness of women's rights has increased and where mechanisms to protect and defend these rights are in place.<sup>11</sup>

Legal reform, police and judicial training, and increasing public awareness of women's rights are long-term strategies to prevent violence against women and provide means of recourse; other short-term strategies exist as well, however, and can be especially effective during and after crises. In these circumstances, specialized awareness raising and psychosocial counseling to women can increase women's awareness of their rights as well as the resources available to protect and support them. As an example, in Sri Lanka and Somalia, post 2004 tsunami, women reported incidents of rape and molestation during rescue operations and while in temporary shelters, and women volunteers in Aceh

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<sup>10</sup> Data compiled by the Inter-Parliamentary Union as of February 2007 found that on average worldwide, women comprise 17 per cent of seats in parliament, a 1.9 percent increase from December 2003, while only 27 countries had met the 1990 target set by ECOSOC of at least 30 percent women's share of seats in parliament.

<sup>11</sup> According to the Secretary-General's report, *In-depth study on all forms of violence against women*, 89 countries currently have some form of legal provision against domestic violence, 93 on trafficking in persons, 90 against sexual harassment and in 104 countries, marital rape may be prosecuted.



reported harassment and intimidation. In response, support was provided to mental health counseling initiatives that enhanced support for survivors of trauma and gender-based violence, reaching approximately 10,000 people in affected communities.

In other ways, as well, efforts to ensure women's security will be increasingly imperative as the secondary effects of climate change unfold. Women are susceptible to gender-based violence and sexual harassment not only in the chaos after natural disasters hit, but during migration, in refugee camps, amid conflict, and in times of social strife—all circumstances which may be exacerbated with climate change. In regions of increasing resource degradation and scarcity, for example, women are at increasing risk of assault as they travel farther and farther distances to obtain sufficient fuel and water. Programmes that work with men and boys, as well as police and justice systems to more systematically focus on implementation of laws and policies will help ensure women's right to a life free of violence under these and other emerging climate-related circumstances.

(6) For the optimal application of all the above practices as well as the development of additional ones that directly address gender differentiated impacts of climate change, accurate data disaggregated by sex is imperative. It is needed to ensure that public policies reflect the realities of women's lives and are founded on real, versus perceived, circumstances for vulnerable populations. In addition to increasing the efficacy of relevant policies, accurate sex-disaggregated data can provide the additional benefit of increasing public awareness of gender equality issues.

Currently, there is a dearth of accurate data disaggregated by sex. According to the UN report, *The World's Women 2005: Progress in Statistics*, gender statistics do not exist in 90 percent of the developing world, and harmonization of gender statistic between multiple sources and objectives is all but absent. In response, a Global Programme on Gender Statistics was recently launched to promote the harmonization of gender statistics activities worldwide, bringing together the UN Statistics Division (UNSD), UN agency partners (including UNIFEM), as well as regional commissions and national development partners. Additional initiatives are necessary, as well, to support local and regional efforts that strengthen disaggregated data collection and statistical analysis, and help ensure gender sensitive policies on all levels—local, regional and global.

## **Conclusion**

The effects of environmental stress caused by global warming seep into many aspects of women's lives, and will more so, as the temperatures and seas rise. While some populations might bear greater hardships, all will be affected, all have a role in mitigation and adaptation measures, and all have a duty to ensure that the security and rights of the most marginalized and vulnerable populations to adverse effects of climate change are respected. Securing and upholding the rights of the most vulnerable are a critical element of ensuring the rights of all.

Gender, like climate change, is a cross-cutting issue. For this reason, effective and just climate change policies require both *climate* objectives and *equity* objectives. Climate objectives are imperative and include, inter alia, protection of bio-diversity, conservation and afforestation, carbon reduction and sequestering, sustainable development and other mitigation measures. Just as significant, however, are *equity* objectives which include, inter alia, the transference of relevant technology and funding for mitigation and adaptation measures to developing states, fostering political and economic empowerment of both women and men, and participatory/inclusive processes that involve women, indigenous and other under-represented but affected and efficacious populations. Marrying the two—climate and equity objectives—will reinforce the capacity of climate change policies and programmes to create sustainable impacts in the lives of people affected by global warming.

## Annex 1

### *Asymmetrical affects of climate change on specific communities:*

- *Coastal communities and island states* are expected to experience exceptional social, economic and political pressures—in isolation or combination. Forecasted consequences for these populations include: (a) migration inland or to neighboring states—en masse or incrementally; (b) food scarcity due to loss of productive and arable land in low-lying regions or deltas; (c) freshwater scarcity due to contamination of deltas, riparian zones and aquifers by rising seawater; and (d) economic recession due to strain on port cities. These shifts may be detrimental to the economies and socio-political resilience of coastal and island states, having significant repercussions for large segments of the world's population, including neighboring or high-emigration states; approximately 44 percent of the world lives within 150 kilometers of the coast, which holds 21 of the world's 33 mega-cities.
- Populations in any *area at high-risk of natural disasters* are especially vulnerable. This includes populations along coasts, in deltas, on low-lying island states, in hilly or mountainous regions with unstable soils, downstream from rapidly melting glaciers, and populations in or on the edge of deserts. The UN IPCC projects increased frequency and intensity of natural disasters due to climate change and depending on the specific type of natural disaster. The latest report states over 90 percent likelihood that extreme heat waves and heavy precipitation will become more frequent, and an over 66 percent likelihood that tropical cyclones (typhoons and hurricanes) will become more intense, with increased top wind speeds and precipitation.<sup>12</sup>
- *Agricultural communities dependent on geo-hydrological cycles or 'natural' watering for crop production* will be especially strained. Shifts in atmospheric temperatures, sea temperatures, and weather patterns will alter rainfall patterns and flooding cycles, having widespread effects on agricultural communities. Over time these shifts (including decreased rainfall) may be remedied via introduction of more suitable crops for an emerging drier climate (where possible), desalinating or other watering technology that enable crop production, compensatory sustainable development, or migration from these areas. These adaptations, however, demand funds, innovation, and transfer of appropriate/suitable technology.
- *Communities highly dependent on a marginal ecosystem for livelihood.* Communities in the polar regions, on the edge of expanding deserts or that utilize marginal land for agriculture, and any population on the economic margin is expected to endure environmental and, therefore, economic strain. Additional unforeseeable effects of rising seas and warming temperatures are expected, as well, since it is virtually impossible to predict all climate-induced changes in complex, sensitive and, especially, marginal ecosystems. These compounding effects will be very challenging for communities on the margin.

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<sup>12</sup> “UN IPCC Climate Change Report 2007: The Physical Science Basis”, p7, 13, 16, 18

- *Developing states*, in general, are expected to bear the brunt of climate change, as they have less capacity (technological, infrastructural and financial) to cope with the challenges. Sound and responsive governance, sustainable development, and access to relevant technology and financial resources, however, can increase the resiliency of these populations.
- *Communities dependent on marine life for sustenance and livelihood*—from large-scale fishing industries to remote native populations—will be especially impacted. Extinction of marine species, ocean “dead spots”, and shifts in marine habitats are projected due to rising sea temperatures, coral bleaching and changes in ocean currents. Scarce and degraded marine life will also hinder the tourism sector, compounding the economic damage to many small island states whose GDPs rely on healthy oceans to support this tourist sector.
- *Rural communities* may be more affected than urban centers, as they are more dependent on renewable natural resources for subsistence and livelihoods, and they are farther from services that provide opportunities and assistance. An estimated 1.4 billion rural people depend on small-scale farming in developing countries,<sup>13</sup> and are especially vulnerable to adverse affects of climate change due to limited resources and limited access to adaptive technology.

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<sup>13</sup> Alison Small, “Climate change a further challenge for gender equity”, FAO Newsroom, 10 March 2008.