



Summary of Step-2 Background Documents from the Preparedness for Climate Change Programme

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Acknowledgements

This report summarizes all country assessment reports written by Red Cross/ Red Crescent (RC/RC) National Societies participating in the 'Preparedness for Climate Change Programme.' These reports were submitted to the Climate Centre between 2006 - 2008 and aim to assess climate change risks, climate variability and their impacts on the most vulnerable populations in each respective country. Furthermore, the reports link these risks to existing programs of the National RC/RC Societies. Herewith we would like to acknowledge the tremendous work done by all climate change focal points at the National RC/ RC level and all IFRC zone and regional offices that were of assistance to them.

Introduction-Humanitarian Work in a Changing Climate

Increased concentrations of heat-trapping greenhouse gases in the atmosphere are causing climate change at a global scale with implications for human health, livelihoods, agricultural and water-resources, and the frequency and severity of climate-related disasters. The Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) shows that increases in average air and ocean temperatures have already been observed, and that these changes in the climate system are already causing significant impacts on physical and biological systems. Globally, the area affected by droughts has increased. In many parts of the world precipitation events have become more extreme. Since 1970, an increase in North Atlantic tropical cyclone activity has been observed.¹

The IPCC offers a range of future emissions scenarios and corresponding forecasts for global average temperature, which range in increases from 1.1°C to 6.4°C by 2090-2099 (compared to 1980-1999). Although warmer temperatures (up to a 3°C increase) can have benefits to agriculture in mid to high latitudes, a 1-2°C increase can have harmful impacts on crop growth in lower latitudes, increasing risk of hunger in seasonally dry or tropical regions. The IPCC anticipates that by the 2080's sea level rise will cause flooding affecting many millions of people each year. It is also expected that climate change will affect health through increased malnutrition, diarrhoeal disease, cardio-respiratory disease from higher ground-level ozone concentrations, the altered distribution of infectious disease vectors, and cause increased deaths, illness and injury from heat waves, floods, storms, fires and droughts.²

The IPCC has further identified certain populations most vulnerable to the impacts of climate change, including populations located along coastal or river flood plains, those with economies linked to climate-sensitive resources such as agriculture and fisheries, densely populated areas prone to extreme weather events, and poor communities that have limited adaptive capacity and are dependent upon local food and water supplies.³

The International Federation of Red Cross and Red Crescent Societies (IFRC) is composed of 186 National Societies operating according to a shared mission, fundamental principles, and strategies. All four central themes of the current IFRC Strategy 2010 will be affected by climate change:

1. Promotion of the movement's Fundamental Principles and humanitarian values
2. Disaster response
3. Disaster preparedness
4. Health and care in the community

In order for the Red Cross to continue working effectively in these areas, and to adhere to its mission of improving the lives of vulnerable people, the Federation must now take climate change into account in terms of how it is already and will continue to affect health, the frequency and severity of natural disasters, and the lives of vulnerable people. Vulnerability to climate change impacts and capacity to adapt varies among populations based on geographic and socioeconomic factors. The Red Cross/Red Crescent Climate Centre's 'Preparedness for Climate Change Programme' (PfCC) offers National Societies (NS) the opportunity to engage in a four-step process of learning and raising awareness about country-specific risks associated

¹ Intergovernmental Panel on Climate Change (IPCC). Climate Change 2007: Synthesis Report. Summary for Policy Makers.

² Intergovernmental Panel on Climate Change (IPCC). Climate Change 2007: Synthesis Report. Summary for Policy Makers.

³ Intergovernmental Panel on Climate Change (IPCC). Climate Change 2007: Synthesis Report. Summary for Policy Makers.

with climate change, analyzing those risks in the context of their country's own vulnerabilities, and developing strategies to prepare and minimize the consequences of climate change for vulnerable communities. These four steps are:

1. Organizing a workshop on the risks of climate change for Red Cross staff
2. Assessing the risks of climate change in the country and the priorities and programmes of the national society through a background document
3. Capacity building for climate resilient RC/RC programmes through exchanging experiences with other national societies and partners in a regional workshop on climate change and disaster risk reduction
4. Developing climate change resilient RC/RC plans and programs

By January 2009, 23 national Societies had completed the National Assessment of the risks of climate change in the country and the priorities and programmes of the national society. This report presents a summary of these assessments for the regions of Latin America and the Caribbean, the Pacific, Africa, and Asia. Each regional section includes:

- 1) an outline of climate risks projected for the region,
- 2) a compilation of risks and vulnerabilities highlighted by National Societies in their step-2 background documents, and
- 3) country-specific summaries of the new ideas National Societies generated in the process of examining how climate change is likely to affect their country

Ideas for how to reduce climate risks (generated in step 2) form the basis for step 4, in which National Societies prioritize strategies and develop proposals for action. We would like to emphasize that the documents submitted by National Red Cross/ Red Crescent Societies do not contain full scientific analyses on climate projections. Rather, they are underlining the main climate risks that their countries face, and prioritizing those risks that are affecting or may affect their work.

II. Latin America and the Caribbean

Climate Risks for Latin America and the Caribbean

The IPCC Fourth Assessment Report projects that over the 21st century Central and South America (with the exception of Southern South America) will experience annual average warming slightly greater than global mean warming. While there will be extensive variation in local precipitation, overall precipitation is expected to decrease in Central America and the Caribbean. Increases in precipitation are expected for parts of South America including: Colombia, Ecuador, Peru and the south-eastern portion of the continent. Many parts of Latin America and the Caribbean are expected to experience increased rainfall variability, meaning that dry periods are expected to become more intense, while at the same time, the annual number of intense rainfall events is expected to increase. Thus climate change threatens many countries in the region with increased droughts and water stress, as well as flooding and landslides. The incidence of stronger hurricanes along the Atlantic storm track is also likely to increase. Sea level rise, warmer temperatures, increases in rainfall variability and extreme weather events are all expected to have a variety of deleterious impacts on human health, livelihoods, coastal communities, agriculture, and water resources.

Snap-shot of Climate Change Risks identified by National Societies in Latin America and the Caribbean through Step 2 of the PfCC Programme

This section focuses on risks described in step-2 documents (completed in 2007 and 2008) by the National Societies of Antigua & Barbuda, Argentina, Colombia, Costa Rica, El Salvador, Guyana, Jamaica, Nicaragua, St. Kitts & Nevis.

Many of these National Societies expressed concern over rising temperatures. The St. Kitts & Nevis Red Cross observed data from the National Met Service showing that annual average temperatures increased from 26.64°C to 27.3°C over the past 35 years. Argentina reviewed regional climate model projections, anticipating that average annual temperatures will increase by +2.5°C to +5.0°C in 2081-2090 (compared to 1981-1990).

Nearly all National Societies in the region expressed concern over increased rainfall variability. St. Kitts reported that flooding has become “an increasingly hazardous phenomenon.” Although Guyana experienced devastating floods in 2005 and 2006, their rainfall data showed a decrease in annual average rainfall since 1960. The simultaneous increase in extreme rainfall events and droughts raised alarm for water-stressed National Societies including El Salvador, St. Kitts & Nevis, Jamaica and Nicaragua. They noted that decreases in rainfall already exacerbate challenges of meeting water demands of the population, tourism and agriculture. In the northern region of Costa Rica, there is evidence of beginning stages of desertification, and tensions are mounting between residents, public authorities and the private sector over competition for water resources.

More extreme rainfall events and droughts were also noted as having consequences for human health. Most National Societies in the region recognized increased risks of vector-borne and water-borne diseases. Although dengue was eradicated in Argentina in 1950, it returned in 1998 to the Jujuy province and spread to the entire northern part of the country. Following heavy rains in 2007, Nicaragua suffered an outbreak of leptospirosis. Malaria was found to be increasing in Colombia and Guyana, along with more cases of asthma and diarrhea. Previously free of both malaria and dengue, Jamaica reported 400 cases of malaria and 100 cases of dengue since

2006. In Costa Rica, where dengue cases have increased significantly in recent years, the *Aedes aegypti* mosquito was found to have expanded its range of dispersion, overcoming previous barriers of temperature and elevation.

The consequences of increased rainfall variability on livelihoods were of particular concern to Caribbean National Societies, whose economies largely revolve around tourism, agriculture, and fishing. Most National Societies also emphasized how increased frequency and severity of floods and storms are likely to interact with rising sea levels, to threaten populous and economically vital coastal communities. Colombia expects that by 2050, the sea level will have risen by 40 cm along its Caribbean coast, and 60 cm along its Pacific coast (compared to 1990 levels), exposing the coastal population of 1.4 million to flooding. In Guyana, Jamaica, St. Kitts & Nevis, and Barbuda & Antigua, the majority of the population and infrastructure are also located along the coast. Sea level rise causes erosion and exacerbates coastal flooding, but was also identified by Antigua & Barbuda, El Salvador and Jamaica as presenting an added stress to the water supply and agriculture through salt-water intrusion.

The increased frequency of intense hurricanes is of grave concern for Central America and the Caribbean. In 2007, Hurricane Felix killed 102 in Nicaragua, damaged/destroyed over 20,000 homes, and eliminated 96% of crops. The Barbuda & Antigua Red Cross noted that hurricane season, which traditionally ended in October, now extends into December. Jamaica described how it had only been directly hit by only two hurricanes during the 20th century; since the year 2000 however, four hurricanes, two of which were category five, have already caused significant damage to the island nation.

Climate Risk Management Strategies Identified by National Societies in Latin America and the Caribbean through Step 2 of the PfCC Programme

Antigua & Barbuda

“As Climate Change increases the effects of natural disasters, so will the need increase for the services of the Red Cross,” writes the Barbuda & Antigua Red Cross. “Mobilizing new volunteers, incorporating climate change into disaster preparedness training and presentations and establishing partnerships with government, donors and other stakeholders will be instrumental to being prepared to respond (pp. 42).” The Antigua & Barbuda Red Cross has identified nation-wide expansion and ongoing training for its Community Disaster Response Teams (CDRT), as a key strategy to minimize the impacts of climate change. In an effort to enhance its preparedness to respond, the Antigua & Barbuda Red Cross also plans to bolster its contingency planning, and improve the location and increase the number of warehouses with response and relief stocks. In addition, the Antigua & Barbuda Red Cross sees the need to enhance disaster risk reduction and food security programmes. It has recognized the utility of forecasts for immediate weather events as well as seasonal outlooks for precipitation, risk of climate-related health epidemics, and food security problems. Furthermore, the Antigua and Barbuda Red Cross cites the need to better communicate this information through early warning systems.

Argentina

The Argentina Red Cross identified areas at greatest risk to climate change by applying a vulnerability index to the regions’ climate projections. The regions of Noreste Litoral, Noroeste

and Nuevo Cuyo were categorized as having the highest of three risk levels due to being both the most vulnerable and in the most danger of climate change threats. The Argentina Red Cross recognizes the elderly as particularly prone to heat stress from more frequent and intense heat waves. To address this concern the report suggests providing elderly with access to air conditioning as well as advice about staying hydrated. Additional actions suggested in the report include informing communities about the impacts of climate change, as well as advocating for improvements in infrastructure and the public health sector.

Colombia

The Colombia Red Cross (CRC) identified the need to prepare for climate change by strengthening and expanding disaster response operations and risk reduction activities. This could be accomplished through the use of vulnerability and capacity assessments, enhanced training, and improved knowledge management so that experience and expertise are not concentrated among a few members of the society, but shared with a wider circle for increased capacity. The CRC also anticipates the need to improve and expand food, water and sanitation programmes due to anticipated reductions in food security and increased rainfall variability. Recent increases in vector-borne diseases including malaria and dengue require that the Colombia Red Cross adjust its health programmes to promote knowledge and resources for disease prevention and medical attention. They plan to work proactively to ensure that the National Roundtable on Climate Change takes into account the voices of all its members when shaping national climate policies. The CRC also hope to increase alliances with other local, national, and global institutions to facilitate successful and relevant local adaptation projects.

Costa Rica

The Costa Rica Red Cross identified several ways to reduce the vulnerability to climate change. In partnership with the government, they would like to evaluate how climate change is projected to impact Costa Rica. The evaluation will enable identification of priority areas and the opportunity to design an appropriate response. Partnerships established through the evaluation process would be strengthened over time, in order to maintain as a key priority, the population's vulnerability to climate change. By bringing climate change to the forefront of their partners' agenda, the national society hopes to foster improved coastal zone and natural resources management, readiness for urban heat waves, smarter land-use planning in flood-prone areas, and other development strategies to minimize risk. The National Society will document and share their experiences and knowledge gained and hopes to advocate on behalf of communities in an international forum, appealing to governments to reduce the main driver of climate change, greenhouse gas emissions.

El Salvador

Water scarcity and poor water quality, due to a combination of increased droughts, floods and salt-water intrusion, are major concerns for the El Salvador Red Cross. In response, they plan to assist the agricultural sector by promoting a diverse selection of drought-resistant crops and adaptive farming techniques. To protect availability of clean water, they also propose improving storm-water, water-storage and distribution systems, assisting in promotion of conservation measures, and developing alternative water supplies. In addition to incorporating climate change into their National Disaster Plan, the El Salvador Red Cross will closely monitor the changing nature of natural disasters, in order to maintain their capacity to respond and help the population adapt. The national society has placed an emphasis on both internal and external education about climate change impacts, and would like to collaborate with other regional and

international organizations to share information, improve practices, and develop policies and mechanisms that support adaptation in developing countries.

Guyana

Before the massive floods of 2005 and 2006, the Guyana Red Cross Society (GRCS) never had to put Disaster Management (DM) very high on its agenda. However, now in its PfCC step-2 document, the National Society expressed a "...dire need of a comprehensive DM Plan." In addition to creating such a plan, the GRCS will consider changes to activities including: contingency/emergency planning, review of relief supply inventory, equipping and training of a large volunteer base, expanding its' Vulnerability and Capacity Assessments to additional communities, and enhancing internal and external climate risk education programmes. The GRCS also cited the need to expand its welfare programmes (Meals on Wheels and Wellness Clinics) in anticipation of an increased need for services during and post disaster. The GRCS proposed modifications of their Health Education and Water and Sanitation programmes, through inclusion of information on: water borne illnesses, water storage and sterilization, and hygiene and sanitation, as part of an effort to disseminate knowledge of climate change impacts and how to respond. The GRCS identified the use of seasonal precipitation forecasts to prepare for flood seasons early on, as well as the need for greater collaboration with other agencies involved in climate related work, particularly the National Climate Change Unit.

Jamaica

Following a hurricane or major disaster, the Jamaica Red Cross (JRC) provides a livelihood recovery programme, which offers alternative occupational training and supplies to those who have lost their livelihoods. The JRC proposes expanding this programme to serve more disaster victims. The JRC is also in the process of ensuring that each parish has an updated disaster management plan, and has emphasized the need for these plans to take climate change into account. In anticipation of an increased need for emergency services, improvement of the cadre and quality of the volunteer base has been identified as a priority to maintain resilience to the added challenges posed by climate change. The JRC is also considering development of more youth-friendly materials and trainings, to equip youth with the skills and capacity to aid relief efforts. With emerging diseases of malaria and dengue, the JRC has envisioned health education programmes that incorporate climate change threats. Public education should include information on how to minimize vector-breeding areas, avoid mosquito bites, recognize the signs and symptoms of malaria and dengue to appropriately seek medical attention, as well as how to take precautions against heat stress and food and water borne diseases.

Nicaragua

The Nicaragua Red Cross (NRC) plans to equip personnel and volunteers with the knowledge, language, and skills to prepare communities to manage increased risk of hydro-meteorological events. The NRC plans to work with communities to develop climate risk scenarios, early warning systems, and use community risk mapping to identify areas of high vulnerability, increase awareness of risk, and train and organize community members to take action. The NRC envisions working with communities on projects related to the intersection of climate change with food security, water security and health. Examples of these community activities include, watershed management, reforestation, water storage and treatment system construction, health education, vector-borne disease prevention, water conservation, drip irrigation, and sharing of best practices among farmers. Rather than develop a stand-alone

climate change unit within the NRC, the focus will be on incorporating climate risk management into all programmes and plans. The NRC has also recognized itself as well positioned to take on a leadership role in advocacy and facilitation of interdisciplinary and multi-sector approaches to addressing climate change adaptation needs in Nicaragua.

St. Kitts & Nevis

Given the risk of increased frequency and severity of disasters posed by climate change, the St. Kitts & Nevis Red Cross found the need to revise their Disaster Plan. They also hope to develop new strategies for evacuation of coastal communities, and to increase capacity of shelter programmes. The National Society would like to conduct a public education campaign and hold climate change workshops in vulnerable communities to increase the adaptive capacity of communities. Additionally, the St. Kitts & Nevis Red Cross recognizes that it must strengthen and expand its network of partners in order to better utilize available resources in adaptation efforts. An emphasis has been placed on the use of local knowledge at the community level, and the need for adaptation strategies to incorporate traditional and indigenous knowledge. In order to stay up-to-date with new scientific information on climate change, the National Society also wishes to conduct an annual review of its adaptation programmes.

III. The Pacific

Climate Risks for the Pacific region

According to a report by the World Bank in 2006⁴ there have been observations of increased cyclone strength and related storm surges in the Pacific region. The increase in the intensity of wave height during cyclones has surpassed even the highest of climate model predictions. Sea level rise is of particular concern to the Pacific Islands region given the small size of the atoll nations. Sea gauges located in the Pacific are recording that high sea level events (that cause inundation) are becoming more severe in countries such as Tuvalu, Solomon Islands, Tonga and the Cook Islands⁵. Saltwater intrusion into the fresh water lenses of tiny atolls can render much of the ground water undrinkable. Climate change also has implications for human security in the Pacific.

The world's authority on climate change, the IPCC, also identified a number of key concerns for small island countries.⁶ These threats are related to (but not limited to) areas such as health, water quality and supply, coastal areas, ecosystems and food security. More specifically we can expect deterioration in coastal conditions, for example through erosion of beaches and coral bleaching, which is expected to affect local resources, e.g., fisheries, and reduce the value of these destinations for tourism. Although rainfall is likely to increase across the equatorial Pacific, increased rainfall variability associated with climate change is also projected to reduce water resources in many small islands by the mid-century, to the point where they become insufficient to meet demand during low rainfall periods. Changes may also result in an increase in the number of hot days, hot nights and heat waves, more intense and longer droughts, more frequent and intense El Niño events, more intense tropical cyclones and increased flooding events.

Snap-shot of Climate Change Risks Identified by National Societies in the Pacific region through Step 2 of the PfCC Programme

This section focuses on risks described in step-2 documents (completed in 2007 and 2008) by the National Societies of Tonga, the Solomon Islands, and the Cook Islands.

The Tonga Red Cross found in its investigations that there has been a decline in rainfall in the central and southern parts of Tonga since the 1970's as well as increases in the average annual temperature. Anecdotal evidence suggests that seasons have become less well defined and rainfall less predictable. Fruit production and animal breeding times have also changed. In the future tropical cyclones are likely to become more intense. Rising sea levels and temperatures are likely to increase incidents of coral bleaching which affects fisheries. It is also likely to result in salt water intrusion. Heavier and less rainfall is likely to have a detrimental effect on human health.

⁴ Bettencourt, S. Croad, R. Freeman, P. Hay, J. Jones, R. King, P. Lal, P. Miller, G. Pswarayan-Riddihough, I. Simpson, A. Teuatabo, N. Trotz, U. Van Aalst, M. (2006) *Not If But When: Adapting to Natural Hazards in the Pacific Islands Region – A Policy Note*. World Bank. http://c3d-unitar.org/c3d/userfiles/Module_3/M3_Pacific_Islands.pdf

⁵ Hall, P. (2008) 'Climate Change and Low Lying Pacific Islands – a Plain Person's Guide to Global Warming, Sea Level Rise and the Threat to the Pacific Islands', Faerber Hall, www.faerberhall.com/topics_enviro.htm (last accessed August 2008)

⁶ Mimura, N.L., L. Nurse, R.F. McLean, J. Agard, L. Briguglio, P. Lefale, R. Payet, and G. Sem (2007) 'Small islands', in M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden, and C.E. Hanson (eds.), *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge: Cambridge University Press, 687–716

Investigations by the Solomon Islands Red Cross Society found that the country has undergone a higher than global average temperature rise of up to 1°C. The Solomon Islands lack scientific data on observed climate trends due to destruction of records during times of unrest and therefore rely heavily on oral history to gauge changes that have occurred. For example in the Guadalcanal Plains area there have been observed increases in rainfall. In other parts there have been unpredictable changes to the advent of wet and dry seasons, making it difficult for farmers to know when to plant their crops. Coupled with factors such as population growth, environmental degradation and urbanization, climate change will exacerbate existing vulnerability in the Solomon Islands. Subsistence agriculture will be affected by any increases in the frequency and intensity of extreme events such as drought, flood and cyclones. The country's atoll islands are also highly vulnerable to rises in sea level that would cause destruction of crops and water supplies due to salt water intrusion and inundation. Health impacts will include thermal stress, undesirable changes in nutrition and disease distribution, intensity and frequency. Dry periods are associated with El Niño events, therefore any change in the intensity or frequency of these events will influence water availability.

According to the Cook Islands Meteorological Service drought is becoming more common and temperatures are also rising in the country. In the Cook Islands there are also more frequent cyclones in recent seasons compared to past periods. Droughts can already result in airlift delivery of water supplies during El Niño events, thus any increase in these events will exacerbate water shortages in remote islands. There have been changes in agriculture where it is becoming common to harvest crops more than once per season. In the future more and longer periods of drought are expected, as well as coastal erosion, increases in bush fires, heavier rainfall, flooding, and generally more extreme events. The Cook Islands are heavily dependent on the pearl industry for livelihoods, and climate change is expected to be detrimental to the industry due to increases in conditions suitable for diseases affecting oysters to proliferate.

Climate Change Risk Management Strategies Identified by National Societies in the Pacific region through Step 2 of the PfCC Programme

Tonga

Through participatory consultation, a secure water supply and mangrove planting to reduce erosion on coastlines are high priorities on the lists of communities on the outer islands of Ha'apai in Tonga. Along with this, the Tonga Red Cross would like to enhance youth engagement on climate change and their other activities through creation of a youth drama group. It is envisaged that raising awareness of disaster risk reduction measures will also be undertaken through use of brochures and stickers in the Tongan language. Strengthening of the Tonga Red Cross disaster management plan is also a priority given increasing climate risks. Relationships and cooperation with other stakeholders in the climate change and disaster risk management arenas are also being built.

Solomon Islands

The National Society has been active in engaging young people in climate change and disaster risk reduction activities such as a National Youth Forum, poster and radio competitions, school visits and World Environment Day activities. It has also been actively engaged with the development of a National Adaptation Programme of Action by bringing community concerns to the fore. One such example is the artificial islands in the Malaita province which are particularly vulnerable to climate change. Sea level rise results in the communities being forced to reinforce

their islands with rock from the reef. This degrades the reef which then in turn provides less of a buffer from storm surges. The Islands are also deficient of water resources, with children paddling to the mainland to fetch water supplies. Changes to wind patterns are making it more difficult to predict inclement weather, endangering those undertaking the passage. Water provision on these islands is therefore of highest priority. Other communities have prioritized mangrove planting to reduce coastal erosion. There are plans to integrate climate change into the proposed disaster risk reduction strategies of the National Society.

Cook Islands

The health of Cook Islanders will be at risk with the loss of agriculture causing food insecurity as less land is available for planting. Cook Islanders will increase an already high dependence on imported food that is often high in fat and sugar. Therefore the Cook Islands Red Cross wishes to work with communities to protect and work land that is suitable for planting to increase health and resilience of communities. Given that traditional knowledge is threatened by climate change they also wish to document it before it is too late. The Cook Islands Red Cross has skilled practitioners in participatory methods that work with communities to reach solutions that the community can be part of. They wish to continue this work and also seek to engage volunteers from the affected communities.

IV. Africa

Climate Risks for Africa

From the many assessments made over recent years it has become clear that Africa is one of the most vulnerable continents to climate change and climate variability. Its vulnerability is aggravated by all other challenges the continent faces, such as endemic poverty, poor governance, conflicts and limited access to capital/markets. Where multiple stress factors reinforce each other, societies become even more vulnerable, and impacts of climate change can be particularly severe. Working Group I of the IPCC Fourth Assessment warns that warming throughout the whole African continent and in all seasons is *very likely* to be larger than the annual global temperature rise. The report also predicts that drier subtropical regions will warm up more than the moister tropics. Annual rainfall is *likely* to decrease in much of Mediterranean Africa and the northern Sahara. There is *likely* to be an increase in annual mean rainfall in East Africa. It is however still unclear how rainfall in the Sahel, the Guinean Coast and the southern Sahara will evolve.⁷

The realization of these predictions will have severe effects on human vulnerability and food security, with water availability likely to be particularly compromised in many African countries. The occurrence of climate extremes such as prolonged droughts and extreme rainfall will be exacerbated. Increased risk of flooding in coastal areas due to sea level rise is expected, and human health will likely be negatively impacted by increases in vector-borne disease.⁸ In the next paragraph we can see that all background reports written by the African Red Cross Societies provide empirical evidence that in fact many of these hazards are already increasing in number and severity.

Snap-shot of Climate Change Risks identified by National Societies in Africa through Step 2 of the PfCC Programme

This section focuses on risks described in step-2 documents (completed in 2007 and 2008) by the National Societies of Kenya, Madagascar, Malawi, Seychelles, Tanzania, and Uganda.

The changing nature of climate related disasters was highlighted in all of the African background reports; prolonged droughts, unprecedented floods, irregular and unreliable rains, landslides, changed disease patterns and vermin/ pest infestations. As most of the countries have economies largely dependent on agriculture, each National Society also highlighted the subject of food insecurity. Large percentages of all populations in Africa live in rural areas and their reliance on agriculture puts them especially at risk in the event of extreme weather events. The Tanzania Red Cross described how the peasant communities lament that they are unable to determine the appropriate planting season due to changed weather patterns. High population density and land degradation are exerting further pressures on natural resources. Food insecurity and access to clean water are the major problems that many African communities are

⁷ Christensen, J.H., B. Hewitson, A. Busuioc, A. Chen, X. Gao, I. Held, R. Jones, R.K. Kolli, W.-T. Kwon, R. Laprise, V. Magaña Rueda, L. Mearns, C.G. Menéndez, J. Räisänen, A. Rinke, A. Sarr and P. Whetton, 2007: Regional Climate Projections. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

⁸ Boko, M., I. Niang, A. Nyong, C. Vogel, A. Githeko, M. Medany, B. Osman-Elasha, R. Tabo and P. Yanda, 2007: Africa. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge UK, 433-467.

facing. As the Malawi National Society wrote, “when frequency and intensity of floods and droughts increases, farmers are left with no time to recover from previous impacts through either asset accumulation or acquiring the skills and knowledge necessary for adapting to future climate change. Consequently, farmers are being subjected to continuous hunger and deeper cycles of poverty and vulnerability.”

In all reports there was emphasis on high susceptibility to major disease outbreaks. Vector and water borne diseases tend to increase during flooding or drought seasons. Changed temperature rainfall in Tanzania and Kenya also spread the range of diseases such as malaria to previously unaffected highland areas. The Malawi Red Cross mentions a noticeable increase in diseases such as malaria, cholera and dysentery all associated with rainfall.

Climate change impacts in the Seychelles are similar to those in many other small islands in the world and are causing great concern to many of these isles. Non-resilient populations and ecosystems in the narrow coastal zones make the Seychelles extremely sensitive to climate change impacts. Coastal communities in Eastern Africa suffer as a result of sea level rise, storm and tidal surges, extreme sea-surface temperatures and flooding.

Climate Change Risk Management Strategies identified by National Societies in Africa region through Step 2 of the PfCC Programme

Malawi

The Malawi Red Cross has seen the number of floods and droughts increase in recent years, which has led to more water and vector borne diseases and food insecurity. Within their Disaster Risk Reduction strategy Malawi focuses on community based adaptation and early warning systems. In 2007 they implemented a project using audio visual tools to inform farmers on agricultural climate adaptation strategies and another participatory video projects to sensitize school children about community based adaptation to climate related disasters. The Malawi Red Cross seeks to mainstream climate change in all their programmes and build community adaptive capacities. They also identified the necessity to strengthen their networks with other organizations in the field, advocate for new governmental climate change initiatives and build further capacity amongst all programme designers and implementers.

Seychelles

The Seychelles Red Cross wants to play an important role in national disaster prevention and building climate resilience in Seychelles. They are working with various national organizations to address climate risks and engage in dialogue with the government, NGOs, community groups and schools. They would like to build a national network of experts and responders to climate change-related disasters and seek access to international centres of expertise to gain knowledge of key adaptation measures such as coastal stabilization techniques, drought-tolerant plants and water conservation. Furthermore the Seychelles Red Cross will focus on capacity building (more trained volunteers and a dedicated ‘disaster management unit’). They have identified health as a priority area, and seek to strengthen community awareness in solid waste disposal, which is one of the primary causes of mosquito-borne epidemics in Seychelles. Food security is also a major priority for which they would like to develop a long-term nutritional and food security strategy for the country. Lastly, the National Society will focus on risk and vulnerability mapping, early warning and evacuation, flooding awareness and training, stockpiling of relief materials and having an influence on planning.

Tanzania

The Tanzania Red Cross is aiming to ensure community based interventions including addressing climate risk based on the results of a 'Vulnerability and Capacity Assessment' (VCA). They will advocate for strengthened cooperation and coordination with different actors, including the government to focus on building capacity of local communities to effectively prepare and respond to disasters. Next the National Society will focus on the integration of climate change risks into all ongoing programmes, collaborate closely with the Tanzania Met Office to ensure that relevant information is disseminated and reaching a large number of communities (also through radio networks), and advocate for prioritization of climate change in strategic/developmental planning in Tanzania. In conjunction with three of their partners, the National Society has already prepared a number of different posters and flyers with clear messages about climate risks, as part of a broad public awareness campaign.

Uganda

The Uganda Red Cross (URC) concludes that more droughts, water stress, flooding and water quality problems can be expected, and thus foresees great implications for its work, particularly in the area of health. According to the URC, the government must address disease regimes that are largely associated with poor environmental and post-flood conditions. The URC plans to integrate climate change consequences into its work and enhance resilience through education, training, sharing of information on best practices, introduction of relevant technologies and management practices, and through strengthening of local institutional capacity. The importance of taking a bottom-up approach with adaptation activities was also emphasized.

Kenya

The Kenya Red Cross Society (KRCS) identified the implications of climate change on food security and intends to work with other stakeholders on enhancing food security programmes. Such programmes would take into account impacts of modified patterns of rainfall, evaporation, surface runoff and soil moisture storage on agriculture and food security. The KRCS would also like to assist in initiatives aimed at developing early warning systems for a range of diseases sensitive to climate change. Seasonal climate forecasts, environmental modelling and public health surveillance techniques could be combined to monitor how climate change is altering health risks. The KRCS envisions supporting a watershed management project, piloted in the main water catchment areas. The project will focus on how inhabitants could adapt to varying water quantities in catchments. The National Society is also working closely with the Kenya Meteorological Service, and intends to partner with them on an assessment of zones affected by droughts and floods and identification of adaptation measures. This partnership may also foster improved early warning systems for floods, similar to the drought warning systems already utilized. Finally, the KRCS seeks to form linkages with various research organizations, implement public awareness campaigns and undertake advocacy with government agencies.

Madagascar

The Madagascar Red Cross (MRC) found that the current food security programmes lack a proper response to cyclones or droughts. In response, the MRC explored the possible extension of their food security activities by providing support to increase yields, protecting slopes and rehabilitating irrigation sources. Another issue exacerbated by rainfall variability associated with climate change, is health related to sanitation. The MRC is working to improve sanitary

conditions and aid in reforestation projects to minimize runoff. In coordination with the Ministry of Health, the MRC also runs a mosquito net distribution campaign. This campaign could be extended to additional regions and combined with climate related health risk education, as well as an effort to minimize mosquito breeding areas (by transporation of potable water and water treatment). The MRC sees a need to develop disaster risk reduction programmes that focus on sustainable protection of the coastal environment to reduce the vulnerability of coastal inhabitants. It is further believed that responding to climate change consequences requires capacity building at the community level, and is giving priority to programmes that build this capacity.

V. Central and South East Asia

In the two very distinct climatic regions Central Asia and South East Asia a number of National Red Cross and Red Crescent Societies have been very active in the programme. From the major threats identified by the IPCC Fourth Assessment Report in 2007 and the Red Cross/ Red Crescent Step 2 background reports, it is clear that the impacts of climate change will impinge on Asia severely. Sustainable development of most Asian developing countries will linger as climate change compounds pressures on livelihoods, natural resources and the environment associated with rapid urbanisation, industrialisation and economic development.

According to the IPCC Fourth Assessment Report, freshwater availability is likely to decrease due to climate change in almost all Asian regions, and could threaten the water resources of more than a billion people by the 2050s. This decrease in water availability is also in large part due to population growth and a rising standard of living. Furthermore, morbidity and mortality due to diarrhoeal disease associated with climate change are expected to rise, while climate-induced disease and heat stress are projected to increase with rising temperatures and greater rainfall variability. The coastline of Asia is threatened by sea-level rise and about a million people are likely to be at risk from flooding. Salt-water intrusion due to sea-level rise and declining river runoff is already affecting the aquaculture industry and infrastructure, particularly in heavily-populated mega deltas.⁹

Snap-shot of Climate Change Risks identified by National Societies in Central Asia and South Asia through Step 2 of the PfCC Programme

In Central Asia, the Kyrgyzstan and Uzbekistan Red Crescent Societies participated in the PfCC Programme and in South East Asia assessments were received from the Indonesian, Laos and Philippines Red Cross Societies.

According to the forecast of climatologists in Kyrgyzstan, the country faces a 10-15% increase in precipitation in the coming century, compared to 1961-1990 (First National Communication of the Kyrgyz Republic under the UNFCCC, 2003). However, this increase in precipitation will not be equally distributed throughout the country. For agricultural conditions, the country does not expect a negative influence from global warming in the near term (until 2010). However due to temperature rise and humidity, the National Society identified a risk of increasing occurrence of infectious diseases and lack of access to available drinking water. The same conclusion was drawn by the Uzbekistan Red Crescent Society who explained how the water resources of trans-boundary rivers of the Aral Sea basin are fully regulated and distributed between the countries in the region, but even at the present time there is significant deficiency of water resources in the region, with the biggest problems growing around the Aral Sea crisis. Most future climate scenarios predict severe water stress for this region. Occurrence of droughts, dry and hot winds, frost, showers, hail and the reduction of snow and ice cover in the mountain areas are becoming well known phenomena in Uzbekistan and many of these hazards are already affecting the availability of fresh water.

Indonesia, located in the tropical belt, is the largest and widest archipelago country in the world with a coast line length of 81,000 km. The country is under the constant threat of a wide range of

⁹ Cruz, R.V., H. Harasawa, M. Lal, S. Wu, Y. Anokhin, B. Punsalmaa, Y. Honda, M. Jafari, C. Li and N. Huu Ninh, 2007: Asia. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 469-506.

natural disasters. Strong winds on coastal areas, floods, droughts and of course the rise of the sea level threaten the population and their industry, agriculture, infrastructure and fisheries. Based on the 2007 World Disaster Report, the total number of people affected by disasters in Indonesia from 1987-1996 was 5.9 million. This number has increased tremendously to 8.5 million people during 1997-2006.¹⁰ Populations concentrated in low-lying coastal areas are increasingly vulnerable to a rise in sea level. Sea level rise is of particular concern to Jakarta, since parts of the city are already subsiding due to excessive exploitation of ground water and soil compression from heavy construction. Intense rainfall and flooding can overwhelm the rudimentary systems of sanitation in slum areas of towns and cities, exposing people to water-borne diseases such as diarrhoea and cholera.

The Philippines is located in the path of cyclones, has long coastlines vulnerable to storm surges, and has observed more extreme wet and dry seasons in recent years. Approximately 50 million people live in coastal areas in the Philippines. Recently, the Philippines' Department of Health has noted an above average occurrence of outbreaks of climate-related diseases. Laos, like the Philippines, is vulnerable to exacerbated cyclones, storms, heavy rainfall, floods, drought and landslides due to climate change. The slopes of the mountains of this land-locked country generate rapid draining from upstream to the low land areas. In 2003, a drought caused significant damage to rice fields, affecting approximately 274,000 people. Also in Laos, floods have been found to affect health due to water born diseases as diarrhea, dengue, dysentery, typhoid and malaria.

Climate Change Risk Management Strategies identified by National Societies in Central and South East Asia through Step 2 of the PfCC Programme

Central Asia

Kyrgyzstan

The Kyrgyzstan Red Crescent Society placed emphasis on increased health risks and lack of access to available drinking water, which are anticipated to be the main problems associated with climate change in the coming decades. The National Society outlined a number of activities to address climate change. First and foremost, they identified continued investment in partnerships with the government and weather station, and establishment of partnerships with relevant actors including the Global Environment Facility (GEF) and the United Nations Development Programme (UNDP). To address the low level awareness regarding climate change within the country and also within the National Society, (especially in the local branches) the KRC aims to launch an education campaign on climate change. Lastly the National Society believes it will be important to assist in programmes aimed at recovering natural ecosystems as mechanisms of minimizing global and local emergency situations.

Uzbekistan

In the Uzbekistan Republic the growing deficiency of water resources has been identified as one of the major climate risks the country will face. Agricultural production, livelihoods and safety of the population throughout the country are all affected by the water stress. In a very elaborate

¹⁰ World Disaster Report 2007, *Focus on Discrimination*, published by International Federation of Red Cross and Red Crescent Societies

background report the National Society ends with a number of clear recommendations for the years to come. Amongst them are ideas on training and sharing experience, strengthening capacity and working out a long-term programme, integrating climate change risks within their Disaster Management and seminars to align with partners.

South East Asia

Indonesia

The Indonesian Red Cross (Palang Merah Indonesia or PMI) has defined four different stages to address climate change. In the first stage they elaborate on 'Advocacy, Awareness and Orientation' activities to be pursued. This includes internal advocacy within PMI at provincial, municipal, district and sub-district levels, and external advocacy to the government, community and stakeholders, such as non-government organizations. In the second stage they elaborate on the development of 'Climate Change Adaptation Tools, Approach and Strategy', where they would like to combine aspects of Climate Change Adaptation with Vulnerability and Capacity Assessments and Participatory Rural Appraisals (PRA) in community based programmes; In the third stage they mention the integration of climate change adaptation into their Disaster Risk Management and Community Based Programmes, including public awareness and orientation campaigns, disaster preparedness and risk reduction publications, as well as health promotion and counselling services; In the fourth stage, they envision the 'promotion of climate change adaptation through disaster preparedness and healthy life behaviour' where they aim to develop further climate change adaptation approaches through community based programmes.

Laos

The Laos Red Cross identified strengthening institutional capacity and poverty reduction programmes as priorities for minimizing vulnerability to climate change. Other areas of their work that intersect with climate change include agriculture, forestry, water and health. Some initiatives to support food security and adaptation of agriculture to climate change include: promotion of rotated rice cultivation and cultivation of short-cycle crops, as well as organization of trainings on how to improve food storage techniques and how to build erosion protection systems. In the forestry sector, slash and burn practices will be discouraged by educational programmes addressing the importance of protecting ecosystems and preventing forest fires. Furthermore, a need for mapping of flood prone areas and flood warning systems was identified. The design and improvement of management systems for the drinking water supply, sanitation, and epidemic disease surveillance could also provide benefits in adaptation efforts.

Philippines

The Philippines Red Cross (PRC) found great potential in the use of climate information and forecasts information to mitigate the associated health impacts of extreme climate events/variability. The local chapters of the Philippine Red Cross have done small scale activities that educated local communities on climate change. The PRC intends to intensify a climate change education campaign on the national level in partnership with other humanitarian organizations, and work with them to ensure that adaptation measures be given priority in climate change negotiations.

VI. Conclusion

In 2007, climate change became a decisive global issue, internationally as well as within the Red Cross and Red Crescent. This was highlighted by the commitments made during the General Assembly of the IFRC and at the International Conference¹¹ of the Red Cross and Red Crescent in November 2007. “ [...] We are resolved to ensure that environmental degradation and adaptation to climate change are integrated, where relevant, in disaster risk reduction and disaster management policies and plans. We will seek to mobilise the necessary human and financial resources to implement them, giving priority to actions for the most vulnerable people.”

Through the step-2 documents summarized above, National Societies have identified both current and anticipated risks associated with climate change, and begun developing strategies to address those risks. The Preparedness for Climate Change (PfCC) Programme has empowered 35 National Societies to take ownership over the process of educating and preparing their communities for further impacts from climate change.

The tremendous amount of work and dedication National Societies have put into their step-2 background documents resulted in 21 elaborate analyses on climate risk from all over the globe. Most of the reports offer comprehensive overviews of country specific climate-related disasters and risks. Many of these reports will result in tangible plans for action. Now that the International Conference 2007 and the PfCC programme has brought the issue of climate change to the forefront for Red Cross and Red Crescent National Societies around the world, the Climate Centre is working in partnership with the National Societies and Federation to identify funds to actualize the many strategic actions National Societies are proposing to protect vulnerable communities from climate change impacts.

During the regional meetings (step 3) much attention is paid to the usage of seasonal forecast and weather predictions. Many National Societies in the programme believe these forecasts to be of great importance in dealing with the increasing extremes and increasing uncertainty about extremes in a changing climate. Bridging information at different timescales, from climate change scenarios to short-term weather forecasts, can create more effective early warning, which can save lives and lead to better response operations. Within their action plans we therefore hope to read more about the use of forecasts at different time scales, through an extensive collaboration with scientific institutions or meteorological offices within their region/countries. As step 2 reports from the PfCC programme have demonstrated, climate change impacts are already being felt, and proactive strategies for adaptation to future climate risks must be taken.

Further information regarding concrete action plans to implement new strategies and scale up existing programmes (step 4 proposals), can be obtained through the Climate Centre at climatecentre@redcross.nl, tel: 0031 (0)70 4455837.

¹¹ The International Conference, which meets every four years, is the highest deliberative body of the Red Cross and Red Crescent Movement and the States that are party to the Geneva Conventions. The Movement is made up of the International Committee of the Red Cross, the International Federation of Red Cross and Red Crescent Societies and 186 National Red Cross and Red Crescent Societies.