

Red Cross/Red Crescent
Climate Guide



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Climate Guide

Foreword

When the International Conference of the Red Cross and Red Crescent first discussed climate change in 1999, few were convinced that humanitarian organizations really needed to worry about it. In those days people considered it an environmental issue; at most a potential risk for the distant future, a scientific debate. When the Climate Centre was established in 2002, we realized its humanitarian implications but thought of climate change primarily as a gradual rise in risks – one we should start preparing for.

Much has changed since then. Not only is the world now convinced that climate change is real, but Red Cross/Red Crescent staff and volunteers also see it happening before their eyes, hitting the most vulnerable people sooner and harder than we had ever expected.

There is little discussion of whether climate change is an issue of concern to the Red Cross and Red Crescent. Instead it has turned to how we can best address the humanitarian consequences.

With this Climate Guide for the Red Cross and Red Crescent we aim to share the experiences of more than 40 National Societies who, in the last five years, have started to address climate change in their work. Their experiences are as diverse as our planet's weather and as wide-ranging as the Red Cross and Red Crescent Movement itself. Yet many similarities shine through. Climate change is new for all of us. We all need an open mind to learn and establish new partnerships. But instead of doing something entirely new and different, we should base our responses on what we already do best, integrating the changing risks in our efforts to serve the most vulnerable people.

Rather than only documenting these experiences, this guide also aims to provide advice. Of course we could not tell every single National Society exactly how the risks are changing and what do to about them. We know much less about your countries and the vulnerable groups they contain than any individual

staff person or volunteer. So instead of providing you with answers, we hope to help you to start asking the right questions about how climate risks affect you and how to address them, and then offer some guidance on how to find the answers yourselves. We have tried to provide step-by-step approaches that can and should be tailored to your circumstances.

Please read this guide as an account of the first round of experiences and approaches. We are just beginning, and many aspects remain to be more fully addressed: food security, migration and conflicts, the balance between quality and the ability to scale up, and last but not least the consequences for the mobilization of volunteers.

This guide is primarily written for the Red Cross and Red Crescent Movement. But as a growing number of humanitarian and development organizations begin to address the impacts of climate change, we are of course happy to share our experiences and views.

There is a lot of work to be done, and fast. Climate change is with us and is making our humanitarian work more difficult. Things are expected to get worse. We will have to be smart and efficient: our aim should be not just to keep up with the changes, but to stay ahead of them. We look forward to working with all of you in shaping the humanitarian answers to the climate challenge.

*Red Cross/Red Crescent Climate Centre
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Guide to the guide

This guide begins with the basics about climate change: the scientific consensus, the humanitarian consequences, and the general implications for the Red Cross and Red Crescent.

This is followed by six thematic modules: Getting started, Dialogues, Communications, Disaster management, Community risk reduction and Health and Care. Each module begins with a background section with real-life Red Cross/Red Crescent experiences and perspectives, followed by a “how-to” section with specific step-by-step guidance. Further information, and updates of the information in this guide, can be found on the Climate Centre website www.climatecentre.org.

Some key messages appear frequently across this guide. This was done on purpose to ensure that separate modules can be read as stand-alone reference materials.

All information from this guide is available on www.climatecentre.org, including updates and links to relevant documents and sources of information, checklists, templates and best practice examples.

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Hurricane Dean is visible from a camera on the International Space Station. Photo: Reuters/NASA TV





Red Cross/Red Crescent Climate Guide
Climate Change: the Basics



Climate Change: the Basics

Scientific consensus: the impact of climate change on the risk of natural disasters

Climate change is already happening

Climate change is happening now. Global surface temperatures rose by over 0.7 °C during the 20th century – making it the warmest period in at least the past 1,300 years. And climate change is accelerating: 11 out of the 12 last years (1995–2006) rank among the warmest years since records began (see figure 1).

...and bringing more extremes

That 0.7 °C may not seem much. Less, for instance, than the temperature difference between day and night. So why worry? Well, think of a patient with a fever: the slightly higher temperature is only an indicator that much more is awry. In the case of the climate it is not so much the average temperature rise that is alarming. Along with the planet's rising temperature, known as global warming, glaciers have been melting, increasing the risk of lake-burst floods and threatening the water supply of millions of people.

IPCC and the scientific consensus

The scientific consensus on climate change is presented in the reports of the Intergovernmental Panel on Climate Change (IPCC), which was established in 1988 by the United Nations Environment Programme and the World Meteorological Organization. The IPCC engages thousands of the world's leading experts to review the published literature on climate change. The summaries for policy-makers are approved, line-by-line, by governments. In 2007, the IPCC was awarded the Nobel Peace Prize. This section summarizes the findings of the IPCC's most recent (2007) survey, the Fourth Assessment Report ("AR4"), especially of Working Group I, which gives an account of the science of climate change, and Working Group II, which reports on impacts, adaptation and vulnerability. The full reports are available on www.ipcc.ch.

Rainfall patterns have also changed, including drying in tropical, subtropical and Mediterranean regions, and increases in average rainfall and snow in temperate regions such as North America, northern Europe and central and northern Asia. Even more worryingly, the frequency and intensity of extreme rainfall and snowfall events have been rising, as well as the number of droughts. We have also witnessed more heatwaves and more intense hurricanes.

It is very likely caused by human activity

It is also clear that these changes are largely caused by humans. According to the Intergovernmental Panel on Climate Change (IPCC), "most of the warming observed since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentration". These greenhouse gases act as a blanket over the earth, keeping it warmer (see box page 14). They are emitted when we burn fossil fuels such as coal, oil or gas, or when we cut down and burn the trees. The current concentrations of greenhouse gases exceed the natural range that has existed for over 650,000 years.

...and it's here to stay

Climate change is here to stay – and will accelerate. This century the temperature increase is likely to range from two to four degrees Celsius (see figure 2). This rate of warming is probably without precedent during at least the last 10,000 years. The worst long-term effects can still be avoided if we substantially cut greenhouse-gas emissions. But however aggressively

we cut back on fossil-fuel use, climate change is bound to continue: the greenhouse gases already emitted stay in the atmosphere for many decades. We have no choice but to cope with the impacts. In terms of disasters, we can expect further increases in heatwaves, floods, droughts and in the intensity of tropical cyclones, as well as extremely high sea levels (see table 1).

Figure 1: Observed changes in global average surface temperature (source: IPCC, 2007)

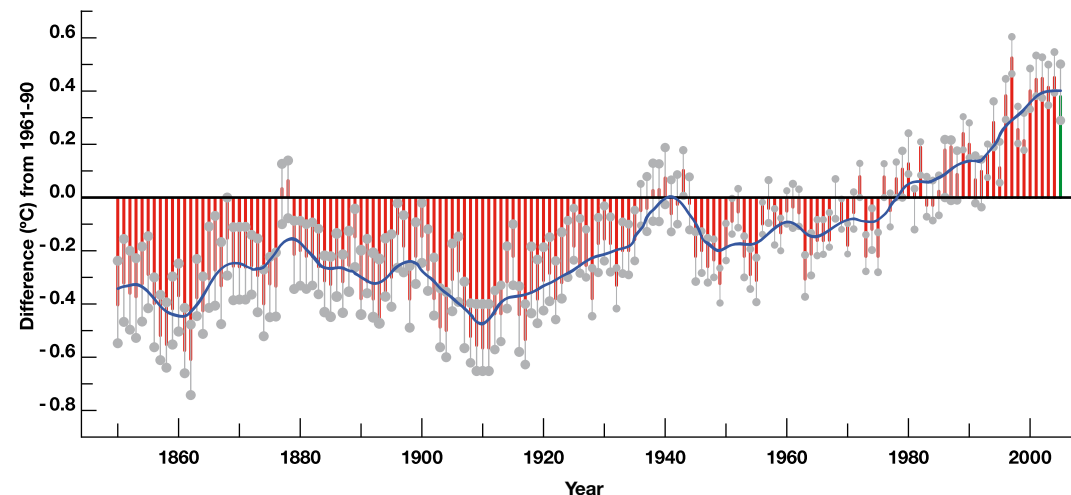
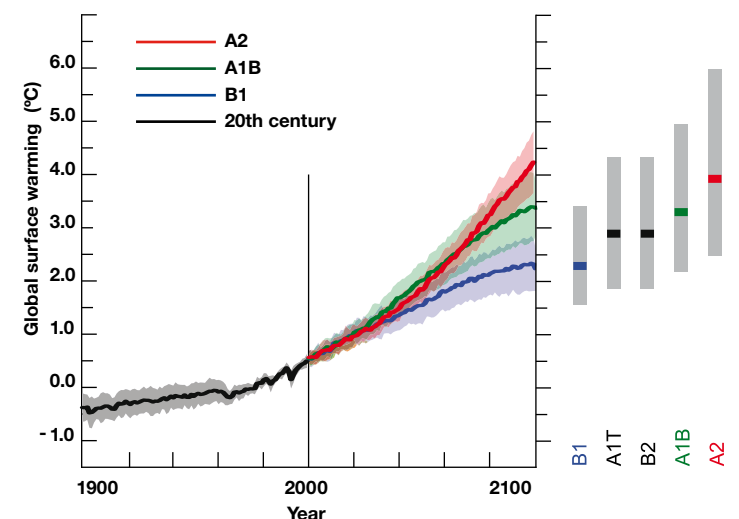


Figure 2: Warming scenarios for the 21st century (source: IPCC, 2007)



Each colored line represents the likely change in global temperature that would occur for a specific greenhouse gas emissions scenario (called A2, A1B, etc. by the IPCC). The shading around it indicates model uncertainty. The bars on the right show the likely temperatures in 2100 for the full set of IPCC emission scenarios.

The black line with grey shading represents the observed global temperatures during the 20th century.

Table 1: Examples of climate change impacts

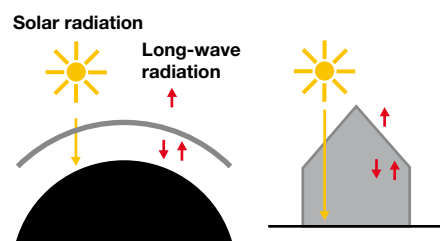
Phenomenon and direction of trend	Likelihood that trend occurred in late 20th century	Likelihood of future trend	Examples of major impacts
Over most land areas, warmer and fewer cold days and nights, warmer and more frequent hot days and nights	Very likely	Virtually certain	<ul style="list-style-type: none"> • Increased agricultural yields in colder environments, decreased yield in warmer environments • Increased insect outbreaks • Effects on water resources relying on snow melt • Reduced mortality from cold exposure • Declining air quality in cities.
Over most land areas, more frequent warm spells/heatwaves	Very likely	Very likely	<ul style="list-style-type: none"> • Reduced yields in warmer regions due to heat stress • Increased risk of bushfire • Increased water demand, water-quality problems • Increased heat-related mortality, particularly for the elderly, chronically sick, very young and socially isolated.
Over most areas, increasing frequency of heavy precipitation	Likely	Very likely	<ul style="list-style-type: none"> • Damage to crops • Soil erosion • Adverse effects on quality of surface and ground water • Water scarcity may be relieved • Increased risk of deaths, injuries, and infectious, respiratory and skin diseases • Disruption of settlements, commerce, transport and societies due to flooding • Pressures on urban and rural infrastructure • Loss of property.
Increasing area affected by drought	Likely in many regions since 1970s	Likely	<ul style="list-style-type: none"> • Land degradation • Lower yields, crop damage • Increased livestock deaths • Increased risk of wildfire • Increased risk of food and water shortage • Increased risk of malnutrition • Increased risk of water- and food-borne diseases • Migration.
Increasing intensity of tropical cyclones	Likely in some regions since 1970s	Likely	<ul style="list-style-type: none"> • Damage to crops and trees • Power outages causing disruptions of public water supply • Increased risk of deaths, injuries and disease spread through water or food • Post-traumatic stress disorder • Disruption by flood and high winds • Withdrawal by private insurers of risk coverage in vulnerable areas • Migration, loss of property.
Increased incidence of extremely high sea levels	Likely	Likely	<ul style="list-style-type: none"> • Salinization of irrigation water and freshwater systems, and decreased freshwater availability • Increased risk of deaths and injuries by drowning in floods • Migration-related health effects • Costs of coastal protection versus relocation • Potential for relocation of people and infrastructure • Tropical-cyclone effects.

Source: IPCC 2007 Working Group II, Summary for Policymakers.

A boatman repairs his boat on the dried up riverbed of the Jialing river running along southwest China's Chongqing municipality. Photo: Reuters/Stringer Shanghai



The greenhouse effect



The figure above illustrates the greenhouse effect. The temperature rise caused by greenhouse gases in the atmosphere is similar to the warming inside a greenhouse. Radiation from the sun travels through the atmosphere and warms the earth's surface. Part of the incoming energy from the sun leaves our planet in the form of heat (long-wave radiation, or infrared). On its way out through the atmosphere, this heat is absorbed by greenhouse gases that act as a blanket over the earth, keeping it warmer. We should be grateful for this effect because it makes life on earth possible. Carbon dioxide and methane are two important greenhouse gases. Adding more of these gases to the atmosphere enhances the greenhouse effect and thus increases the average temperature at the earth's surface: global warming.

Since the end of the industrial revolution, concentrations of carbon dioxide, which is produced by burning fossil fuels (coal, oil, natural gas), have risen by over 30 per cent, while methane has approximately doubled. Carbon dioxide molecules can live around 100 years in the atmosphere, and they now stand at a concentration of about 385 parts per million (ppm), as compared to a pre-industrial concentration of about 280 ppm. The current concentration of carbon dioxide is at least a quarter higher than at any other time during the past 650,000 years. If we carry on burning fossil fuel in a "business as usual" way, carbon dioxide concentrations will rise to 600 or 700 ppm by the year 2100. Even if the whole world worked very hard to limit emissions, carbon dioxide concentrations are unlikely to stabilize below 450 ppm.

It will hit the poor and the vulnerable

The impacts of climate change will fall disproportionately upon developing countries and poor people in all countries – in other words, those who have contributed least to greenhouse gas emissions. This in turn will exacerbate existing inequities in health status and access to adequate food, clean water and other resources.

A warmer world can have positive and negative effects. But even small changes will create negative impacts in the most vulnerable areas of the world, including virtually all developing countries. And the bigger the changes, the more negative the effects will be all around the globe.

...and threaten human health

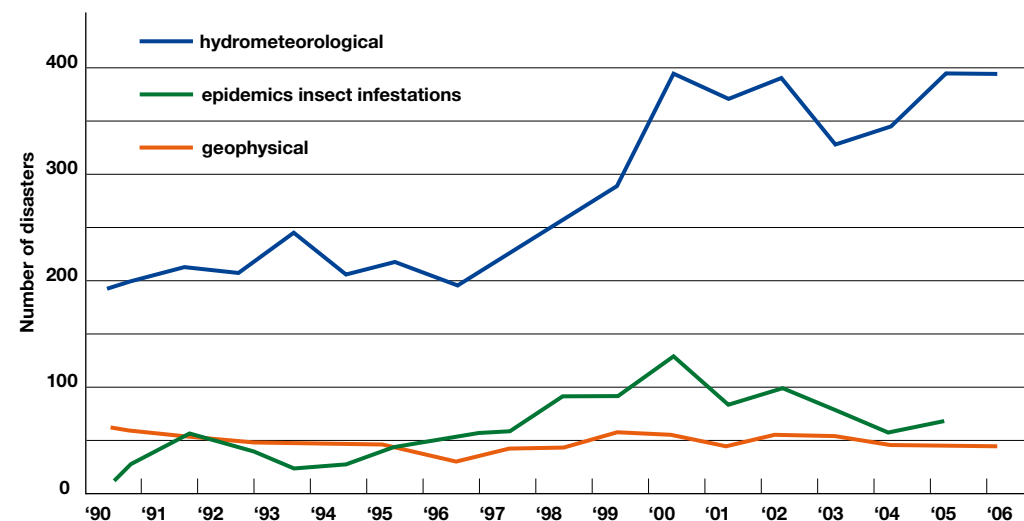
Water scarcity will increase in many areas. In Africa, up to 250 million people will suffer water stress by 2020. Food security is bound to be compromised as agricultural productivity declines.

Threats to human health include heat stress, injuries and disease brought by storms, floods and droughts, changes in the range of vector-borne diseases, and decreases in water quality, air quality and food security. Small islands face long-term sea-level rise and will also be affected by increasing storm surges and cyclones long before they are actually submerged. Densely populated river deltas in Asia are also particularly vulnerable, as are other coastal areas.

International efforts to reduce greenhouse-gas emissions are underway

Long-term climate change and its impacts can be lessened by reducing emissions of greenhouse gases. In 1992, the UN Framework Convention on Climate Change (UNFCCC) was established to reduce global warming and to cope with inevitable temperature increases. As scientific evidence for climate change grew stronger during the 1990s, parties to the UNFCCC signed the Kyoto Protocol in 1997, which includes mandatory reductions of greenhouse-gas emissions for developed countries. Some key countries, such as the US and Australia, have not ratified it. Negotiations on a new protocol began in 2007, to be concluded by 2009.

Figure 3: Annual number of natural disasters (source: CRED EM-DAT)



...but further climate change is unavoidable, so we have to adapt

The international efforts to reduce greenhouse-gas emissions are crucial to avoid the worst-case scenarios for the end of this century. In the coming few decades however, climate change is bound to continue regardless of how well those efforts succeed, simply due to the greenhouse gases we have already emitted, which stay in the atmosphere for a very long time. Therefore, in the short term, we have no choice but to deal with these changes as best as we can – "adaptation". In practice, this will work best if strategies to reduce climate-related risks are integrated in ongoing development and disaster risk reduction. This comprehensive approach to manage the rising risks is called "climate risk management".

Rising disaster impacts

In the past years, there has been a large rise in the number of disasters (from between 200 and 250 in the period 1987–97 to about double that in the first seven years of the 21st century). This rise is caused

almost entirely by an increase in weather-related disasters (see figure 3). For instance, the number of disastrous storms has doubled. Disaster statistics also show that floods are occurring not just more often but also damage greater areas than they did two decades ago. And these rises are accompanied by a rapid increase in socio-economic losses and in the number of people affected: on average 250 million people a year, up by more than 30 per cent in just a decade. Although since the 1970s, the number of people killed by natural disasters has decreased, largely due to better disaster preparedness, in the past years, that decrease has been tapering off and even reversing.

Specific examples of recent disasters that clearly fit the trend of rising risks due to climate change are: the European heatwave of 2003, which killed over 35,000 people; the devastating 2005 Atlantic hurricane season, including Katrina, the costliest disaster ever with US\$ 125 billion in damages, and Wilma, the most powerful Atlantic storm ever recorded; the massive flooding during the Asian monsoon of 2007; and floods following droughts in various parts of Africa, devastating the livelihoods of millions of people.

Reducing Greenhouse Gases

The Red Cross and Red Crescent and other humanitarian organizations are in the front line of climate change impacts.

If we are concerned about climate change and we know it is very likely to be caused by human actions, what should we do ourselves to address the root cause of the problem? This question is raised by more and more National Societies.

1. Save energy

There is a growing number of organizations and companies around the world who can advise on how to reduce National Societies' use of energy in offices and vehicles.

Often very simple technological measures like turning down heating or air-conditioning can save a lot of energy.

Better use and better maintenance of vehicles is also an energy saver.

An energy-conscious attitude by Red Cross/Red Crescent staff and volunteers can be encouraged. You can show how much energy and money have been saved after a certain period and reward staff. Competitions for the best energy-saving idea are another way of stimulating engagement.

Energy-saving measures do not only apply at national and local level but also internationally. We will need to look more closely at the energy costs of international meetings and travel and see whether there are good substitutes like teleconferencing.

2. Use green energy

After reducing your overall energy use you might want to have a look at your main energy source. Are there renewable energy sources available that don't emit greenhouse gases?

In some high-income countries energy companies enable consumers to buy green energy from renewable sources like biofuel, solar power, hydroelectricity and wind turbines.

3. Compensate for your emissions

Full carbon neutrality in which our activities do not add any greenhouse gas to the atmosphere at all is unlikely in the near future. So in addition to saving energy or using renewable energy sources we can compensate for emissions.

For example, if you have a return flight to Geneva you can calculate how much greenhouse gas this emits. You can then compensate for these emissions by paying a specialist organization to plant trees or run renewable-energy projects.

In the Red Cross and Red Crescent ideas are emerging on how risk-reduction programmes, like planting trees against landslides and desertification or (in Vietnam, for example) mangroves against storm surges, can benefit from such schemes.

4. What comes first?

In some National Societies there have been discussions about whether the Red Cross and Red Crescent should address climate change without putting our own house in order on energy use. However, the Climate Centre strongly feels that our primary responsibility is to help vulnerable people deal with rising climate risks. Assisting them is our core mandate, and if we fail to do that we fail as an organization. We don't hold planes on the ground or keep trucks in our warehouses after an emergency because they emit greenhouse gases.

Then again, the Red Cross and Red Crescent, and particularly National Societies in rich countries, can and should join the global challenge to reduce the emissions of greenhouse gases.

But we are not just seeing an increase in mega-disasters – there is also an increase in smaller ones that do not capture the attention of the world's media, but do have tremendous impacts on lives and livelihoods, particularly of the most vulnerable people. Importantly, those who depend on nature for their livelihoods are increasingly unable to figure out what to expect and what decisions to make, for example when or what to plant, particularly given changes in the timing and intensity of rainfall.

This rise in losses and people affected reflects a growing vulnerability to natural hazards, and in particular to hazards related to weather and climate such as floods and droughts, which dominate the disaster statistics. This growing vulnerability is intimately tied to development patterns: unsound environmental practices, population growth, urbanization, social injustice, poverty, and economic short-sightedness are producing vulnerable societies. And there is the risk that disasters themselves trap people in vicious circles: the most vulnerable become even more vulnerable to new disasters.

The rising vulnerability is compounded by the trends in extreme events and additional uncertainties associated with climate change. This makes the challenge of managing the rising risks and reducing our vulnerability more difficult, but also even more urgent. A changing climate means more work for humanitarian organizations.

Addressing the humanitarian consequences: a call to action

Unless mankind manages to curtail emissions of greenhouse gases, the long-term consequences of climate change will be nothing short of catastrophic, with annual economic losses up to 20 per cent of the world economy and humanitarian consequences on a much larger scale than the increase in disasters we are currently witnessing. The Red Cross and Red Crescent, and particularly National Societies in developed countries, can do their share in limiting

global emissions, for instance by promoting energy efficiency in their offices, and compensating for the emissions in their operations (see box on page 16).

But regardless of how the world manages to tackle that long-term challenge, substantial changes are already with us, and further rises in risk unavoidable, at the very least for several decades to come. And as the global climate is changing, the Red Cross/Red Crescent Movement needs to change as well. Climate change directly affects the Red Cross and Red Crescent's core mandate: assistance to the most vulnerable. Inaction is not an option: either we address the rising risks, or we fail to address our own mandate.

From human resources planning and training to programme design and implementation, our work will need to integrate new challenges and opportunities. From strategic planners in Geneva headquarters to volunteers in flood-prone villages, everybody will need to be aware that we are facing new risks, and will have to plan and act accordingly.

The main question is not *if* but *how* to address the risks of climate change. While some impacts can already be seen, or projected fairly accurately, many others will appear as surprises, or only become apparent once climate change progresses. Climate change thus not only raises the risks but also increases the uncertainties. A country may be hit by a once-in-a-century flood this year and by a heatwave or drought the next. And it may face more complex disasters, compounded by poverty, disease or conflict.

However, surprises are not something the Red Cross and Red Crescent cannot handle. In fact, they fit our core mandate: to assist the most vulnerable in *any* situation. Addressing the rising risks is not something new – we just need to integrate the notion of changing risks into everything we do, aware that the range of extreme events may be growing. We must enhance our ability to respond and help people to reduce their vulnerability. This guide contains many examples of National Societies already doing so. The following section summarizes the key elements of their approach.

Six components of good climate risk management:

There are many things National Societies can do to address the humanitarian consequences of climate change, individually and through the International Federation. The following six items summarize the key components of such *climate risk management*:

I Climate risk assessment: assessing priorities, and planning follow-up

National Societies should start taking account of the rising risks in strategies and programme design, prioritization of activities and allocation of resources. The first step is to designate a focal point, and make a preliminary assessment of the potential impacts of climate change and the implications for their mandate and programmes. *The module Getting Started helps National Societies take the first steps doing this.*

II Addressing the consequences: integrating climate change in programmes and activities

The core response should be to integrate the notion of the rising risks into the programme areas that are most affected:

- **Disaster Management**

First and foremost, climate change will bring more and different disasters, affecting all aspects of disaster management, ranging from an increase in relief operations to a need for more and better disaster risk reduction (*see the module Disaster Management*).

- **Community risk reduction**

In particular, National Societies need to step up efforts to help communities address the rising risks, through community based risk reduction, using tools such as Vulnerability and Capacity Assessments (*see the module Community risk reduction*).

- **Health and Care**

Changing disease patterns will require adjustments in programmes to address health risks and promote health and care at the community level (*see the module Health and Care*).

- **Food Security**

Climate change is a major threat to food security, particularly in Africa, and will need to be addressed in food-security programmes, both through enhanced relief and better prevention. *Few National Societies have explicitly integrated climate change into their food-security programmes. Over time, the Climate Centre will be developing additional guidance in this area.*

- **Water and Sanitation (Watsan)**

Many National Societies are addressing water and sanitation issues, which are closely coupled to our priorities to promote better health and care. It is clear that climate change will have a major impact on water in many countries, and these changes will need to be factored into the design of Watsan programmes and infrastructure. *Few National Societies have explicitly integrated climate change into their Watsan programmes. Over time, the Climate Centre will be developing additional guidance in this area.*

- **Migration and conflict**

Climate change is almost never the only reason people move, so it is important not to oversimplify the connections between climate, migration and conflict. However, climate change can indeed aggravate pressure on scarce resources, threaten livelihoods and trigger migration due to extreme events. *More research is expected in this area, and the Climate Centre will be developing additional guidance.*

New funding for climate change may help to facilitate integration of climate risk management into Red Cross/Red Crescent programmes (*see box on page 21*).

III Raising awareness

One important role of the Red Cross and Red Crescent is to help people and institutions learn about climate change and its humanitarian consequences, both through community-based activities and public-awareness campaigns. *The module on Communications helps National Societies to think through what and how they want to communicate about climate change.*

People paddle a raft down a flooded street in Sirajganj town, Bangladesh. Photo: Reuters/Rafiqur Rahman



IV Establishing and enhancing partnerships

Addressing climate change cannot be done in isolation. Risk assessments require inputs from climate experts (for instance, from the national meteorological office). Risk reduction often requires partnerships with governments, other NGOs, businesses, and others. National Societies' local reach puts them in a strong position to help bridge the gaps between national and local stakeholders. *The module Dialogues helps National Societies to build a network to knowledge centres, government agencies, and other actors.*

V International advocacy: shaping the global response to climate change

At the international level, the Red Cross and Red Crescent has to advocate for the most vulnerable people, and ensure that they are included in the global response to climate change. As the world's largest humanitarian network, the International Federation is uniquely placed to relate the humanitarian consequences of climate change to the wider arena of international humanitarian, development and climate policy, including through the UNFCCC. We also have a responsibility to call on all governments to address the problem driving climate change – the emission of greenhouse gases.

VI Documenting and sharing experiences and information

We are only starting to address the rising risks, and there is much to learn. This guide is an initial attempt to learn from experience and distill guidance. National Societies should analyse and document their experiences, in order to refine their own response to the changing risks, but also to share them with others, within and beyond the Red Cross and Red Crescent.

What the Climate Centre can do for you

The Red Cross/Red Crescent Climate Centre is a reference centre of the International Federation. Established in 2002 and based at the Netherlands Red Cross headquarters in The Hague, it helps the Red Cross and Red Crescent Movement to understand and address the humanitarian consequences of climate change. The Climate Centre assists National Societies and the International Federation through:

- Guidance on how to integrate climate change into planning and programmes
- Answers to specific questions during programme implementation
- Regular updates on climate-related news, policy and science
- Exchange of experiences and documentation of best practice
- Training and capacity building on climate risk management
- Fostering a climate change network within the Red Cross and Red Crescent
- Connections to relevant knowledge centres, NGOs and government contacts
- Assistance with communication and media strategies
- Support for the development and use of participatory audio-visual tools in climate-related programmes
- Advice on attracting (new) financial resources for climate risk reduction
- Development of Red Cross/Red Crescent policies and positions related to climate change, and advocacy.

Our support is aimed especially at National Societies in developing countries that are most vulnerable to the impacts of climate change. We also help National Societies in wealthy countries to assess their own programmes and to mobilize resources to support societies in the developing world.

Funding for climate risk reduction

Developing countries

It is widely acknowledged that climate change is a reality and that developing countries will be hit worst. Funding mechanisms are appearing to meet this challenge and can be expected to continue.

Some existing channels of funding now favour programme proposals that integrate climate risk reduction. One example is the DIPECHO programme of the European Commission (2006–7). If climate change is explicitly addressed, the proposed programme is more likely to be funded.

In addition, bilateral and multilateral donors are developing special channels for climate risk reduction (or “adaptation”) which could also be accessed by the Red Cross and Red Crescent. For example, the European Commission has announced the intention to establish a Global Climate Change Alliance with a fund of €50 million to start with. Several bilateral donor agencies have also earmarked money for adaptation.

At the global level, the UN Climate Change Convention and its Kyoto Protocol have spawned several funds for adaptation, including the Least Developed Countries Fund, the Special Climate Change Fund and the Adaptation Fund. The procedures for accessing these funds are complex but still evolving. Additionally, many other donors are increasingly supporting climate change work among vulnerable communities (including foundations, the private sector, and research bodies).

High-income countries

A growing number of industrialized countries are beginning to address climate change risks at the national level: some countries are already investing tens of millions of dollars and reserving billions. Few National Societies are engaged in these processes.

One specific area that is given a high priority by many industrialized countries is public awareness-raising about climate change. The Red Cross and Red Crescent could become more engaged in this process by highlighting the humanitarian consequences of climate change.

As scientific evidence grows and public and political pressure to act mounts, there will be more and more funding to address the rising risks. It is vital that the Red Cross and Red Crescent is engaged: to shape funding policies so that they really address the needs of the most vulnerable; to balance funding for adaptation in high-income countries and for the poorest countries; and to manage rising risk using our ability to address the needs of the most vulnerable.

The Climate Centre is actively following the global debates on funding for adaptation, particularly for developing countries and integration with bilateral and multilateral development assistance. National Societies should not hesitate to contact us for advice and help: www.climatecentre.org.



Red Cross/Red Crescent Climate Guide
Getting Started

Getting Started

The global climate is changing, and vulnerable communities around the world are feeling the change. Scientists tell us with great confidence that rainfall, temperatures and winds will continue to surprise us, often in negative ways. What should the Red Cross and Red Crescent Movement prepare for?

The what-if scenarios of climate change preoccupy journalists, academics and politicians. What if the polar ice caps continue to melt at the present rate? What if the oceans rise a metre and a half by the end of the century? What if greenhouse gases cannot be contained by 2020?

What-if is not a scenario the Red Cross and Red Crescent finds useful. National Societies are paying full attention to *what-is*, and what will get worse before it gets better. Like the deaths from a heatwave that in 2006 hit safe and affluent France with one of the world's top ten natural disasters, just three years after an even worse heatwave killed thousands of people.

Climate change is here and now and even rich countries are suffering from extreme weather events.

In less wealthy ones climate change impacts are creating new complex emergencies.

The rapid succession of drought-flood-drought is causing enduring disaster in parts of Africa. The irregularity of seasons is hurting farmers on every continent. Asia's rural poor get poorer and poorer as floods become fiercer and more frequent. The Pacific's rising sea level threatens the existence of some countries whose fishermen and farmers already struggle amid the – partly climate-related – destruction of their environment. Rising temperatures are resulting in malaria outbreaks at higher and higher altitudes. The poor, the elderly and the disabled are bearing the brunt of these changes in climate risks.

The causes of climate change have the world's attention and many organizations campaign on the reduction of greenhouse-gas emissions. Hardly anyone, however, is dealing seriously with the impact on vulnerable people, with the humanitarian consequences of the problem.

People in developing countries, and particularly the poorest, do not possess the means to fend off floods, droughts and other catastrophes. Making matters worse, livelihoods are often climate sensitive such as in agriculture where changes in climate patterns are even undermining traditional knowledge. On some Pacific islands, like the Solomons, seasonal winds have always determined when crops are planted. Today they are no longer reliable, causing new and growing challenges.

Islanders wonder what is happening. George Baragamu of the Solomon Islands Red Cross says, "Climate change is something new for many of them. They have heard about it, of course, but they don't have a deep understanding".

The need to understand what is happening, and the empowerment that such knowledge can bring has persuaded his National Society, along with a growing number around the world, to begin the Red Cross/Red Crescent Preparedness for Climate Change programme. They know the most effective way to deal with the rising risks is to have them recognized

and factored into their programmes, especially those involving risk reduction.

Now is the time to start supporting communities as they begin to prepare for these new threats but the question often is: where do we begin? This module's How-to section aims to help National Societies get started.

Understanding the implications

Climate change changes everything. The latest report from the Intergovernmental Panel on Climate Change confirms our worst fears – that vulnerable groups are at greatest risk when it comes to climate change.

It is time for the entire international community to understand and accept that traditional ways of thinking about disaster response no longer apply. Experts expect that there will be more and more floods, droughts and heatwaves, making it harder for poor people to pick up the pieces and stretching the resources of aid agencies further and further.

That does not mean that we need new programmes. Preparing for, reducing the risk of, and responding to natural hazards is what the Red Cross and Red Crescent already does. The new reality requires only that climate change be mainstreamed into disaster management, health and care, as well as other weather-sensitive areas of work (such as food security or water and sanitation). Dealing with new threats, preparing for the unpredictable, is what is called for.

Given the international community's belated acknowledgement that climate change is real, there is a danger of moving from denial to despair. But something can always be done to protect vulnerable people.

Natural hazards need not lead to calamity. Floods only become disasters when they disrupt a community's normal functioning. Risk-reduction measures minimize the odds of that occurring and help communities bounce back.

The solutions may lie in early-warning systems, storm-resistant housing, or in alternative crops that can thrive in soils turned saline by the seepage of rising sea levels or coastal floods. Or in commonplace measures: educating children on how to behave in emergencies, evacuation plans, action teams, escape routes, disaster calendars, planting trees on hills and shorelines against landslides and surges.

Indeed, many good strategies for climate change adaptation are indistinguishable from conventional risk management: if you take a photo of a flood shelter, you can't tell whether the building is for conventional disaster preparedness or for adaptation to climate change. The important difference is not so much in the outputs of Red Cross/Red Crescent work, but rather in the process. With changing risks, we have to rethink what can go wrong, and whether or not to do something about it. Communities can be better prepared and more resilient, particularly when governments and aid agencies work together.

As risks related to climate change increase so does the urgency of implementing disaster risk-reduction approaches we already have. But information about the way the risks are rising may need to be factored into the responses, given that some traditional solutions may no longer work.

Ground-breaking work by the Samoa Red Cross has shown that adapting to climate change in the Pacific is not just about building expensive sea walls. There are many low-cost options a National Society can assist with. It now ensures the voices of vulnerable people are heard and practical risk-reduction steps are taken.

The process begins with internal communication, convincing boards if necessary, reassessing priorities, rethinking strategies and approaches. Climate change is a social and economic issue that cuts right across core areas of Red Cross/Red Crescent interest. Or as Secretary General Tautala Mauala has put it in plainer language, it directly affects her society's endeavours to protect vulnerable people. "The Red Cross has a responsibility to work on climate change," she says.



“Climate change is something new for many of the islanders”

GEORGE BARAGAMU, SOLOMON ISLANDS

To get the Samoa Red Cross started Maka Sapolu, the society's climate change and disaster-preparedness officer, led workshops with staff and volunteers on Samoa's two main islands. They discussed what climate change was, what that meant for their people, and how the Red Cross could assist in addressing it.

Then they sat down with community leaders and government to see how climate change could be integrated into disaster management. The process brought new contacts with the Departments of Meteorology, Environment and Health, the National Disaster Management Office, the Water Authority and NGOs.

Common concerns were soon found, growing water shortages among them. Samoa holds some of the oldest weather records in the Pacific and they show a steady increase in temperature and a decrease in rainfall. Community talks confirmed that scarcity of water had become a major issue, and government departments have made it a key priority in their national adaptation programme.

One of the most practical steps the Red Cross has taken has allowed it to leap the language barrier. Nearly every village in Samoa has a different term for north, south, east and west, making it somewhat problematic to issue early warnings or direct people to shelters when an emergency approaches.

So the National Society now assists with the interpretation of meteorological information and weather warnings. A better example of how the Red Cross can help communities take low or no-cost measures towards being better prepared would be extremely hard to find.

Assessing the risks of climate change

By getting started on climate change, National Societies find gaps and opportunities, additional arguments for proactive disaster risk reduction and possibly the chance of new funding.

The Philippine Red Cross was one of those that got started in 2007. Successive typhoons and other disasters have left alarm bells ringing in the nation's collective consciousness. An unprecedented five super typhoons swept the archipelago in as many months in 2006, leaving more than 2,000 people dead or missing. Another 1,100 died when monsoon rains triggered landslides that buried entire villages.

The growing force and frequency of natural hazards prompted the National Society to consult the Red Cross/Red Crescent Climate Centre and the International Federation's regional delegation on facing the implications. An internal workshop that also involved Manila's own climate change centre followed, where the relevance of climate change to existing Red Cross programmes was discussed and priorities considered.

The need for an analysis of high-risk areas became clear and the National Society is assessing the threats and coordinating action with agencies and groups who share their concerns and philosophy.

The risk to already vulnerable people in the Philippines is particularly high on the agenda.

Our challenge as members of the Red Cross and Red Crescent Movement is to integrate available knowledge about climate change into our humanitarian work. This task requires some learning and a lot of new thinking. The kind of work we do will be fundamentally the same, but some new action is needed.

Getting Started

How-to guide

Although a growing number of national Red Cross/Red Crescent societies recognize the need to integrate climate change into their work, it's not always clear where to begin.

This section aims to help National Societies to get started: what should the first steps be in coming to terms with the rising risks of climate change and the implications for the work of the National Society?

Step by step: where to begin

Step 1:

A first orientation.

Organize a workshop with staff at national headquarters about the potential risks of climate change for your country and how these risks might affect the National Society's mission and programmes. One or two national climate change experts can be invited to make a presentation.

After this workshop, you will have a first impression of what the threats may mean. Some people may find that the presentations are very scientific and complicated, or relate only to the very long-term. Don't be intimidated by scientific perspectives, and don't expect them to provide you with clear-cut answers. Instead, keep asking the experts, and yourselves, about the implications. You are the expert

on Red Cross/Red Crescent responsibilities, and you know how the weather is affecting your country. If the weather is changing, you must be the one to understand what that means for your work.

Step 2:

Designate a focal point.

If you decide climate change requires further attention, it is helpful to appoint a climate change focal point within the National Society. This person will follow up on the outcomes of the workshop, particularly by:

- Building a network on climate change – such as with departments of meteorology, environment and health, the national disaster management office, water authority and NGOs – to gather information on climate change science and policy and seek attention for the impact on the most vulnerable people.
- Staying up-to-date with relevant information and aware of meetings happening in the country.
- Liaising with the Red Cross/Red Crescent Climate Centre and the regional network of colleagues working on climate change.
- On the basis of those networks, information, and analyses, raising awareness within the organization on how risks may be changing.

In some bigger National Societies, there may be several

climate focal points, for instance one for health and one for disaster management. The focal point may also organize a small climate working group for advice and feedback.

Step 3:

Analysis and assessment of priorities.

The next step is to prepare a national climate risk assessment. This should contain a broad analysis of the implications of climate change for the country and the National Society.

Look more deeply into available information about the risks, both in the country and the region, and face up to what it tells you. This national climate risk assessment could be distributed to key National Society staff. In addition, you can prepare a briefer and simpler version for wider distribution to volunteers and field staff

Prioritize the climate change risks that should be addressed first, or the programmes that are most vulnerable to them. The National Society may become more aware of certain aspects because of the risk analyses. For example, in mountainous areas the risk of heavier rains may increase the risks of flash floods. Red Cross/Red Crescent branches in these regions may be prioritized for awareness and disaster preparedness programmes.

Volunteer Sandra Roxana Flores watches children drinking clean water from one of the taps of Colonia Mitch in Guatemala, built for victims of the flooding caused by its namesake, Hurricane Mitch. Photo: Marko Kovic/International Federation of Red Cross and Red Crescent Societies



Or the National Society may prioritize investments in a better early warning system and more intense contacts with the meteorological services for timely indications that extreme weather is on the way. Or the mobilization of new volunteers may be re-energized because of the increasing risks of climate change.

Step 4:

Act!

From here on, climate change should be addressed through regular programmes, integrated into the National Society's work on disaster management, health and so on, as well as into advocacy and outreach. The following modules of this guide address each of these topics separately.

Importantly, at this stage climate change should no longer be an issue in isolation. The climate change focal point will have been particularly successful if he or she can now start doing less, and regular staff in National Society departments start taking over.

Checklist

- Organise a workshop about climate change.
- Appoint a climate change focal point.
- Make an analysis of climate risks for the country and how they relate to Red Cross or Red Crescent priorities and programmes.
- Prioritize the first actions the National Society wants to take to address the risks of climate change.
- Act!

Pitfalls

Climate change is an overwhelming problem, so don't get overwhelmed. Start with issues that are of direct relevance to your National Society. For instance, better networking with your meteorological office and improved early warning is always good. Volunteer mobilization to take care of the elderly because they are vulnerable to heatwaves is another example. Even if the heatwave does not occur it is a good intervention. And raising the awareness of local communities about the surprises climate change may bring is always helpful.

Opportunities

Climate change can be perceived as abstract and long-term. An extreme weather event (not necessarily a disaster) may act as a catalyst for increased awareness and action. Use it.

Further information

All information from this guide is available on www.climatecentre.org, including updates and links to relevant documents and sources of information, checklists, templates and best practice examples.



People look at damage caused by a landslide in the city of Chanchamayo in Junin, Peru. Photo: Reuters/Ho New



“THE RECENT FLOODS WERE VERY UNUSUAL”

Case Study: **Indonesia**

Disaster is never far from the people of Indonesia. An archipelago of 17,000 islands, Indonesia has over the past decade experienced increasingly frequent natural disasters, from severe floods and droughts to tsunamis, earthquakes and volcanic eruptions. Government statistics show it has averaged as much as 2.7 disasters a day over a 12-month period.

Global warming is already taking its toll and far worse is on the horizon. For Palang Merah Indonesia (PMI), the Indonesian Red Cross, the integration of climate change into its community-based disaster preparedness and risk reduction programmes is proceeding with urgency: to confront today's challenges and reduce tomorrow's vulnerabilities.

Indonesia is increasingly vulnerable to the impact of climate change. Global warming threatens to raise sea levels and flood coastal farming areas.

Increased temperatures, shortened rainy seasons, intensified rainfall and prolonged droughts and floods could bring serious food security and health threats and endanger the habitats and livelihoods of coastal communities.

These are some of the conclusions of a report from the consulting arm of leading Indonesian research institute Pelangi Indonesia, sponsored by the World Bank and Britain's Department for International Development. It followed a warning from Indonesia's Environment Minister Rachmat Witoelar that the country could lose as many as 2,000 small islands by 2030 due to a rise in sea levels.

Pelangi Indonesia, an independent body that advises the ministry, is blunt. Climate change phenomena will affect millions of Indonesians, if not by displacing them directly then by eliminating the industrial or agricultural zones or fisheries upon which their livelihoods and welfare depend. Flood control and sewerage systems will be overwhelmed, leading to more waterborne diseases, and disruption of commercial and transport networks.

To address global warming strong commitment and action plans are needed. The challenge facing the International Federation, the Indonesian Red Cross (PMI) and other stakeholders is the integration of adaptation measures with existing efforts in disaster risk reduction and health and care programmes. At-risk communities should be prioritized for preparedness and prevention. Adapting to climate change and doing something about it at community level can both address current concerns and reduce vulnerabilities to future risk.

Costs of disaster

Indonesia has a dry season with an east monsoon (June–September) and a rainy season with a west monsoon (December–March). Temperatures remain high throughout the year and there is very little difference from month to month.

It is one of the world's most disaster-prone countries, regularly beset by droughts, epidemics, floods, earthquakes, landslides, volcanic eruptions, tsunami waves and wildfires. According to the Centre for Research on the Epidemiology of Disasters (CRED), there have been over 100 major floods in the last century, 85 earthquakes and 46 volcanic eruptions.

These disasters, particularly floods, have serious economic consequences. Floods that covered a wide area of West Java and Banten in February 2007 left almost half a million people homeless or displaced. Commerce and telecommunications systems were disrupted for several weeks, causing economic damage totalling as much as \$US 1 billion.

CRED's 2006 Annual Disaster Statistic Review put Indonesia top of the regional list of disaster-affected countries. The data also show that there was a major increase in the frequency of floods which accounted for 59 per cent of all disasters that year.

“In recent years, rainfall patterns in Indonesia have been changing and unpredictable. Sometimes it rains in the dry season and other times it is very hot in the

rainy season,” said Arifin Muh Hadi, PMI's Head of Disaster Management. “The February flood can probably be seen as a climate change impact because these previously unusual occurrences are becoming more commonplace.”

Flood risks tripling

Jakarta, the Indonesian capital, and its 12 million inhabitants experienced severe floods following torrential rains in February 2007. Rivers and streams burst their banks and some areas were inundated with heavily polluted water to a depth of four metres. Thousands of houses, buildings and roads were submerged. Telephone lines and electricity networks were cut off in some parts of the city. Floodwaters blocked major roads and paralysed transportation. People were trapped on roofs while evacuations and distribution of relief items were hampered by the limited number of available rubber boats. This event caused multiple health problems, including an outbreak of dengue fever.

Although Jakarta is hit by floods in five-yearly cycles, these were the worst in 30 years, according to eyewitnesses, and analyses by climate scientists from the Royal Netherlands Meteorological Institute suggest worse to come. The risk of flooding on February's scale may already be 20 per cent higher than 30 years ago due to global warming, they say, and may well continue to rise, tripling over the course of this century.

“I don't remember we ever had floods like this before” The water rose so quickly to four metres, reaching our second floor. We had to move out,” said Red Cross volunteer Deasy Sujatiningrani, 25, a resident in the Tangerang district of West Jakarta. “With the previous floods in 2002, city dwellers could still commute. But the recent floods were very unusual”. Rawa Buaya community in Cenkareng, West Jakarta, was another hard-hit area. This slum area, home for some 2,000 impoverished residents, was inundated by water from the nearby Cikamangi River that poured into the congested streets.

Most of Rawa Buaya's residents come from the provinces. Ponira, a 40-year-old housewife, has been here for years with her 16-year-old son, Ahmad, and her husband, Mustakin, who works at a construction site in Jakarta.

The floodwater reached halfway up the front door of her house. "We didn't move out. We just stayed on the second floor," said Ponirah. When asked what the cause of the flooding was in this area, Ponirah was reluctant to answer. She then laughed shyly, saying: "It's probably because of our children. They always throw garbage into the river."

According to PMI's Arifin Muh Hadi many city dwellers remain confused. But since the Red Cross started its integrated community-based risk reduction/ climate change programme the public has become more aware of such issues as garbage collection, cleaning drains and other disaster preparedness and health-related concerns.

PMI and climate change

PMI, the Netherlands Red Cross through the Red Cross/Red Crescent Climate Centre, and the International Federation began work on a joint integrated programme in 2005, supported later by the German Red Cross. PMI then became part of an Indonesian climate change network comprising the Ministry of Environment and its Climate Change Focal Point, the national meteorological office, Pelangi Indonesia, the United States Agency for International Development, Bogor Agricultural University and other agencies.

The programme is based at PMI's East and West Jakarta branches, focusing on Kampung Malayu sub-district in the east city and Rawa Buaya in the west. The selection of these branches hinged on the risk of extreme weather events and projected climate change impacts; poverty issues; capacity and commitment of PMI branches; support from local government and the will and capacities of communities to implement the programme.

Achmad Djaelani, of the PMI's Disaster Management Information System noted, "The programme was established in Jakarta as a result of climate change phenomena like last February's floods."

The PMI national board has made climate change one of its continuing priorities. It was the theme for World Red Cross Red Crescent Day in 2007 and for discussions at the organisation's annual general meeting.

"So far we have trained volunteers from selected PMI chapters and branches," said Bevita Dwi Meidityawati, PMI Community-Based Disaster Preparedness Coordinator. "It's just starting, but we believe our volunteers will be able to help promote public awareness through our continuing efforts in community-based activities."

The Federation's Indonesia delegation cooperates with Pelangi Indonesia, and the research institute has assisted PMI to be a resource agency on climate change and energy issues at various training sessions.

"People really need to be convinced that climate changes are already happening and affecting the way we live, be it rising sea level, flooding or droughts," said Nugroho Nurdikiawan of Pelangi Indonesia's information and communication department. "We need evidence but the problem in Indonesia is that there is not enough data or research on such issues." More research was required to support advocacy, he said.

Integrating climate change

Wajo district is one of the most disaster-prone areas in South Sulawesi. It contains Tempe Lake, the biggest lake in the region. Nine rivers feed into it, but there is only one exit, which is often blocked by fishing nets. The local population uses the river for drinking water, as a toilet, and as a dump.

The district has a population of 360,000 people. The majority of residents in Wajo are fishermen and their

families, living in areas vulnerable to natural disasters. Wajo frequently experiences floods, fires, typhoons, landslides, and shipwrecks. The most recent disaster was heavy floods in July which affected over 8,000. This year the 400-household village of Laelo was flooded for over four weeks.

"Floods are a common problem here," said Abu Bakar Fattah, 61. "The local government has a policy to relocate us to other areas which are safer, but we don't want to move. This land belongs to our ancestors and we don't know how to earn our living if we are not fishing."

Muhamad Idris, 42, does not want to leave either. During the floods he could still go fishing, although he earned less. "Since fishing doesn't always give enough income for us to survive, we must look for sideline jobs. I sometimes work at a construction site in town."

PMI has been working with the Danish Red Cross to implement a community-based disaster preparedness (CBDP) programme, aiming to improve disaster preparedness to reduce risks from natural hazard, and to build capacity of the local communities to deal with disasters. Typical issues addressed are the provision of clean drinking water; the prevention of flooding, landslides, erosion, coastal abrasion; and the construction of earthquake-resistant houses.

For Lars Moller, Danish Red Cross coordinator for CBDP programmes in Sulawesi, the integration of climate change issues in the programme's next stage is a natural progression.

"When Danish Red Cross planned and implemented its community-based disaster preparedness programme in South Sulawesi five years ago, the climate change issue wasn't really integrated. But as climate change has started to have an influence we will adjust in the next stage to better serve the community and the local people."

Lake Tempe is often covered by water hyacinth plants that spread rapidly, creating many problems for Laelo villagers. The plants have obstructed

the flow of rivers into the lake and also cause the riverbeds to silt up. During floods they are swept into huge masses and can damage houses when carried along by the torrent.

"Most Laelo villagers have little knowledge that the flooding results from chronic environmental problems in the area," said PMI's Irawan Kharie. "And they don't understand what 'climate change' is really about."

Previously, there was a lack of awareness about environmental protection, especially related to the growth of settlements along the rivers and a reduced water catchment area. The local government still focused its disaster management on relief, response and development activities. It paid little attention to getting the community to respond to disasters, resulting in a lack of skilled and competent disaster response personnel.

After the CBDP programme came to Wajo, the risk of damage by water hyacinths was reduced by building a barrier of concrete poles to prevent the plants from hitting houses. A group of selected local villagers were also trained as members of PMI's community-based action team. New infrastructure, equipment and facilities and health-care improvements were introduced: towers for clean drinking water in the villages, the provision of information and 24-hour health centres.

"Though the CBDP programme here was not directly involved with climate change in the beginning, there are components of climate change issues that PMI integrated into its preparedness, prevention and response action plans," said Arifin Muh Hadi.

"There is no single climate change standard, but it should be mainstreamed or integrated into each specific programme," he continued. "For example, a disaster management or health programme should have climate change elements as part of its plan.

"In South Sulawesi, the CBDP programme is technically not a climate change programme. But it has elements linked to climate issues such as floods and

rainfall patterns. We can see from what the villagers told us about changes in rainfall patterns and difficulties in rain forecasts.”

Advocacy and awareness

In response to climate change impacts, the Indonesian Red Cross Communication Unit has initiated practical and strategic measures to implement community-based programmes for “Climate Change Adaptation”, known locally as *Adaptasi Perubahan Iklim* (API).

PMI has integrated climate change components into its community-based programmes in four stages. The first stage focuses on advocacy, awareness and orientation with both internal advocacy (within PMI at all provincial, municipal, district and sub-district levels) and external advocacy to the government, community and stakeholders such as NGOs, the International Federation and National Societies. An orientation and awareness of API is also provided to PMI management, staff and volunteers.

This advocacy method includes development of networks with agencies involved in API efforts, such as the Environment Ministry, Indonesian Forum for the Environment, Meteorology and Geophysics Agency, Indonesian Institute of Sciences, Centre for International Forestry Research, and Pelangi Indonesia.

“The term ‘climate change’ sounds very abstract to most people. Most of them still don’t understand what it is about. But PMI feels this is the time to start doing something to educate and inform the public through our community based programmes,” said Maria Rosa Aswi Reksaningtyas, head of PMI’s Communication Division.

“We are now working on the first stage after having officially launched the public awareness campaign on climate change issues on World Red Cross Red Crescent Day last May in Jakarta,” said Aswi. “This stage may take some time, but we will continue

to work closely with our Red Cross chapter and branches.”

For the second stage, PMI aims to develop tools for climate change adaptation through community-based programmes already launched in Indonesia. This can be done with new activities and areas selected for the development of climate change measures as part of risk reduction campaigns. In the third stage, there will be an integration of climate change into disaster risk management and community-based programmes and the training of Red Cross youth, disaster response, community-based action teams and village health volunteers.

During the last stage, PMI plans to promote adaptation by introducing climate change content to education curricula and training materials.

Rawa Buaya community provides one example of PMI communicating climate change issues to the public through ongoing programmes. “It’s not just about risk reduction but also the participation of PMI Headquarters and NGOs working on climate change,” said Achmad Djaelani.

Red Cross/Red Crescent roles

The roles of the International Federation and its National Societies are significant, particularly when global communities face a series of intensifying climate change effects with a dramatic increase in both the number of people affected and socio-economic losses.

CRED’s 2006 review of disaster numbers and trends reported that Asia remained the most affected region in terms of people killed. Moreover, US\$ 3.2 billion in economic damage was recorded in Southeast Asia that year, far more than the US\$ 1.05 billion average from 2000–2004.

Hence, the International Federation must strive to reduce potential risks while strengthening capacity building in disaster preparedness and response in

areas prone to natural disasters, said Jeong Park, Disaster Management Coordinator in Indonesia.

“As the Red Cross and Red Crescent, we have to translate scientific phenomena into things people can understand,” he continued. “That’s sensitization. We attempt to show that simple things in daily life are very much relevant to climate change adaptation.” Take throwing away plastic bags, he said. They could block drains and worsen floods caused by heavier rainfall.

The way forward

The integrated community-based risk reduction/ climate change project in Jakarta is now in its first phase. Due to end in 2008, it is mainly focused on conventional disaster preparedness for climate change. Other projects include dissemination and risk reduction activities and leadership orientation for community education.

“The awareness of the importance of integrated community-based risk reduction should eventually be seen in an improvement in preparedness and community involvement in advocacy campaigns,” said Jeong.

“Jakarta’s urban poor are the target groups for these climate change programmes. If they’re successful, improvement in the community and urban environment will lead to poverty reduction.”

When disaster strikes, the already underprivileged suffer most. In Indonesia as elsewhere, the grass-roots presence of the Red Cross and Red Crescent makes reducing the risks a natural priority.



Red Cross/Red Crescent Climate Guide
Dialogues



Dialogues

Tataua Pese is in no doubt where the front line of climate change is. It is creeping up the beach of his South Pacific island home: the sea level is rising at twice the average global rate that scientists had forecast. It is eating away at the shore. As in so many places around the world, local residents who notice rapid and dangerous changes wonder why it is happening, what to do about it, and who can help.

If it goes on like this, it is feared, the nine coral atolls and islands north of Fiji that comprise the Polynesian nation of Tuvalu will be gone within a century. The people could be gone within decades.

Pese, the Tuvalu Red Cross's climate change and disaster management officer, told colleagues at a Red Cross/Red Crescent conference in The Hague, "Our highest point is only four metres above sea level. Most people live at between one and three. My country is 100 per cent vulnerable."

With a total landmass of just 26 square kilometres, Tuvalu's 10,000 inhabitants are all coastal dwellers. A few minutes walk from any shoreline you reach the

water on the other side. When the big waves come, the tidal surges, there is nowhere else to go. Unless you consider New Zealand where 4,000 Tuvaluans already reside and an official intake of 75 a year helps increase the number.

Tataua Pese is going nowhere. He'll be the last man standing if he has his way, the last man boarding the last of the ships, although before that day arrives much can be done to help islanders adapt to the changing situation. All is not lost. There's life among the atolls yet.

How good it can be depends on partnerships, the Tuvaluan says. Because the challenges are so immense, because time is ticking faster in the South Pacific, because resources are limited, those confronting the changes must pull together. The way Pese sees it knowledge must be pooled, strategies shared, available means aligned.

"This isn't something you do on your own. With small islands like these it is very important stakeholders work hand in hand and know what each other is doing, and what they do well," he contends. "Together we can do a lot more."

Dialogue sought around the world

The Red Cross and Red Crescent Movement never works in isolation, on small islands or anywhere else. But partnerships, one of its strategic directions, were never more important than in the context of global warming. Around the world, as National Societies have taken on climate change programmes they have sought dialogue with government and local authority, with meteorological offices, universities and other centres of knowledge, and with NGOs, civil society. By reaching out to others they have started to network.

Perhaps in a very small country cooperation comes more easily. Everyone knows one another. Even so, when the Red Cross showed concern about climate change it surprised the Tuvalu government. Had the Red Cross become environmental?



"My country is 100 per cent vulnerable"

TATAUA PESE, TUVALU

The National Society explained it was the humanitarian consequences on which it wished to focus. Through its community presence it was very well placed, particularly for raising awareness among the islanders and developing risk reduction.

Tataua Pese is close to government today, close to the meteorological office, and extremely close to the national disaster management agency where the coordinator depends upon Red Cross support. "He doesn't have staff," Pese says, "but we have capacity in our volunteers. The coordinator appreciates that."

Particularly during flooding. Alongside awareness and risk-reduction measures, the Red Cross has strengthened its disaster response as well. Once upon a time unusually high tides could be predicted by islanders. They came early each year to the islands. Now they come any time, the most invasive from January to April. The Red Cross assists with evacuation and shelter, and consults with the authorities and NGOs on measures to protect particularly endangered places.

What Pese fears most is a tide surge caused by one of the ever-more-frequent cyclones. "It hasn't happened yet but I am sure it will come," he says, predicting a major disaster.

Support for cooperation on all fronts has come from the Tuvalu Climate Action Network (TuCAN) of which Pese is a founding member. A working group, it brings together government, church, NGOs and the Red Cross. Through TuCAN, WWF has supported the development of a toolkit to assess community dangers and how to respond to them.

Such is the teamwork, the Red Cross delayed the start of its own community self-assessments (see *Community Risk Reduction*) until the toolkit was complete, and a common approach could be implemented. Pese says, "The Red Cross has a clear role here in the islands. We have our own activities and agenda but with TuCAN we do things as a group." Awareness raising is one of them, something that is so much stronger when organizations agree on the message they want to get across.

Helping vulnerable people to help themselves

Cooperation is at its best when everyone recognizes their own agenda. Networks like TuCAN can only strengthen that because defining what one does, and does not, is prerequisite to how it operates.

On World Environment Day on 5 June, the Tuvalu Red Cross campaigns with the others for islanders to care for their own environment. "It is," Pese says, "one of our big clean-up days. We clean up along the shore to protect the coral. Dumping rubbish there is a national habit but it affects the coral in the lagoon so we campaign against it."

There is nothing wrong in that. There would be nothing wrong in helping to promote clean energy for the islands, even if greenhouse-gas emissions in Tuvalu are less than the flatulence of a herd of cows in a corner of a field in Germany. It might even embarrass

the world's biggest producers, whose pollution is warming the ocean and doing most of the coral damage, into moving faster.

But for the Red Cross the 5 June event is not merely an environmental effort: Healthy corals support local livelihoods, ultimately reducing the vulnerability of islanders to climate change. Similarly, planting of trees along the shore to help reduce the strength of the waves, and thus the coastal erosion, is the more important lesson. "Our main task," Pese says, "is working with the communities to understand what is happening and how they can reduce the impact."

That is the core of Red Cross/Red Crescent work: to help vulnerable people to help themselves. And what makes it easier for National Societies is that as independent auxiliaries to public authorities in humanitarian activity the role of the Red Cross and Red Crescent is clearly described in existing agreements with governments.

Some National Societies, in fact, have found themselves in a position to influence national policy. The Nicaraguan Red Cross is one of them. It plays a key role in the country's National Risk Management Plan, working with decision makers at a national and regional level to enhance their collective disaster response, from training to coordinating response procedures.

One of the lessons learned there has been the value of the Red Cross and Red Crescent as a bridge builder between the climate change world and that of disaster risk management. In most countries climate change is dealt with by environment-related government departments focusing on pollution issues, with little involvement of disaster-related ones. The Red Cross and Red Crescent can facilitate dialogue and strengthen the disaster-management (DM) component in national climate change policy.

The Viet Nam Red Cross is another society connecting a national DM system with climate change players and environmental institutes. When the country's disaster-management board was not invited to a climate change conference organized by a government

agency, the society approached the agency, expressed interest and have since been included in that network. In southern Africa, the Mozambique Red Cross has brought government agencies together with community leaders at national, district and local level to share information about extreme weather and the need to develop more resilience to storms, floods and droughts. The Malawi Red Cross is working with the meteorological service and rural community leaders to ensure that subsistence farmers can receive, understand, trust, and act upon the climate information produced by scientists.

And in the Netherlands, the Red Cross has shown what can be achieved by bringing people together. Heatwaves over the past few years have brought increasing death and the Red Cross felt that the Netherlands was unprepared for more and longer hot spells. Advocating heatwave preparedness, the Red Cross opened a dialogue with the health ministry and more than 60 organizations. They found unexpected partners – in construction, the health sector, knowledge centres and elsewhere – and created a broad platform recommending action. The upshot was a national heatwave plan, which came into force in 2007.

Dialogue with knowledge centres is fundamental but can be challenging. One National Society officer from Latin America tells how on starting a climate change programme she went to her meteorological office for advice. They provided a mass of information on agriculture and rainfall that she studied diligently for a couple of months. At the end of it all her head was spinning: she understood nothing even vaguely useful.

The challenge is mutual. More and more scientific institutes are turning to climate change, and some universities are developing curricula. But most are science-oriented, intent on doing research and publishing it in scientific journals using sophisticated language. How the knowledge can be communicated to vulnerable people in a way that benefits even the poorly educated without compromising scientific complexity is something academics want answered as well.





“Perhaps we have been addressing climate change, only before we didn’t recognize it”

BEVITA DWI MEIDITYAWATI, INDONESIA

A question being asked by some National Societies is: how complete does the information need to be? It isn’t easy to deal with the uncertainties that are a part of the science.

Tight partnership with local government

Setting up meetings with meteorological offices to discuss what they do and do not know about expected impacts of climate change, and with academic institutions to learn what they do and do not do in research and support of government policies, is the starting point.

For Palang Merah Indonesia (PMI), the Indonesian Red Cross, dialogue with knowledge centres has come through the climate change network they are part of. Both the national meteorological office and Bogor agricultural university are in the group that also includes the environment ministry and an independent research institute that advises it,

Friends of the Earth Indonesia, the United States Agency for International Development, WWF and other agencies.

A tight partnership with local government and the community is a key element for the success of its long-term disaster management plan, starting from the village up through sub-district, regency and provincial levels in the form of technical and financial assistance. Health, social affairs, public works, education, water supply and forestry agencies can all be part of it.

The structures and processes stand PMI in good stead. Climate change as such has only now begun to be integrated into what the National Society does, but the preparedness programmes could have been written for it. “Perhaps we have been addressing climate change,” says PMI disaster preparedness coordinator, Bevita Dwi Meidityawati, “only before we didn’t recognize it.”

The Polewali Mandar district in West Sulawesi provides an example. Back in 2003 cooperating with the Danish Red Cross, PMI introduced a five-year community-based disaster-preparedness programme to four provinces, including West Sulawesi. Developed in line with government structures, it covered 15 villages, three of them in Polewali Mandar. It was a bottom-up approach, the communities themselves identifying and mapping potential risks to their lives and livelihoods, and compiling an action plan to avoid or at least reduce the negative consequences.

The threats in Polewali Mandar come mainly from sea erosion and river floods. The villages are sited along the beaches, caught between the sea on one side, the river on the other. A wave-breaker project and mangrove planting to protect the shoreline have brought improvement already, along with the construction of a health post and a safe water supply.

An adaptive response for climate change might augment the programme but would not alter the direction because it already contributes to disaster risk reduction nor would it depart from the partnership practice in which PMI looks for “intensive participation” from

community, government and any other institutions or NGOs that share an interest.

Among the lessons learned, Bevita Dwi cites the importance of mainstreaming the community-based disaster preparedness concept into local government. One way to do that, she says, is to integrate the community action plan into the government’s development strategy.

PMI would seem to be on track. What they have achieved in West Sulawesi and elsewhere the government is keen to replicate in other places, with and without the Red Cross.

Now that really is networking.

Dialogues

How-to guide

The Red Cross and Red Crescent does not work in isolation and this is particularly true for climate change work. It is crucial to develop and maintain contacts with government at local and national level, knowledge centres like meteorological offices and universities, and other actors in civil society.

Red Cross/Red Crescent work on climate change should be connected to government policies. In many countries, the National Society has an agreement with government, and dialogue with authorities can be seen in that context. A Red Cross or Red Crescent society could even be a partner in developing national policy on the humanitarian consequences of climate change, since climate risk reduction and adaptation is new to most governments.

This section gives you suggestions on strengthening your partnerships or starting new ones, and is particularly relevant for your National Society's climate change focal point. Later on, when more Red Cross/Red Crescent departments integrate climate change into their planning and programmes, this section will be helpful for them, too.

Dialogue with knowledge centres

Because climate change is such a broad issue it is important that what your National Society communicates about climate change is science-based. To achieve this you need a good relationship with the knowledge centres in your country.

Much of the knowledge can be found at the national meteorological office and sometimes at universities. However, their prime objective is to do research and to publish it in a technically rigorous manner. For many scientists it is a challenge to communicate their knowledge in a way everyone can understand but still reflect scientific complexity.

It can be difficult to deal with their information, particularly the uncertainties that are an inherent part of the scientific world. Since Red Cross/Red Crescent staff cannot be expected to be familiar with the technical aspects of climate science, it is perfectly reasonable to ask experts to try to simplify their key messages.

If your National Society is helping to disseminate them, the experts must ensure that the most important aspects of climate change are expressed in plain language. Always feel free to ask for clarification and simplification when learning about climate science.

Most of the work on climate change science has involved projections for the coming decades and even centuries. This is slowly changing and there is more research into observed changes in weather patterns and extreme events. Additionally, shorter-term forecasts for such things as intense rainfall, tropical cyclones and even seasonal rainfall have improved considerably and may be very useful for disaster-management planning (see *Disaster Management: How-to guide and Community risk reduction: How-to guide*).

Checklist

- Organize meetings with your national meteorological office and other knowledge centres, like universities.
- Discuss with them what they know and do not know about the expected impacts of climate change in your country.
- Does your meteorological office get seasonal forecasts (weather patterns for three months ahead) and how do they use them and communicate them to society?
- Expect to be bombarded with complicated words and figures. Be prepared to ask repeatedly for clarification and simplification, so you can take the right message from the knowledge centres to the people at risk.
- Identify possible niches for Red Cross/Red Crescent action, like bringing the knowledge centres

A Kenyan woman struggling to find enough water after the failure of the rains in 2005. An estimated 2.5 million people needed emergency aid, and thirty per cent of the livestock died. Photo: Anthony Mwangi/Kenyan Red Cross



in contact with communities so they can better understand the needs and issues of the most vulnerable people, or ensuring communication of longer-term forecasts to local communities (see box on the right).

- Ask your climate change experts to be engaged in your publications and other communication tools (such as videos and theatre productions), to make sure what you write, say or portray is correct.

Pitfalls

The science of climate change may be presented in a very abstract or complex way. Don't be intimidated; be patient and outspoken in your need for simple messages.

Opportunities

A national Red Cross or Red Crescent society may be an interesting outlet through which knowledge centres can communicate.

Dialogue with your government

Almost all governments have written reports about the vulnerability of their countries to climate change. These are the *national communications* written for the United Nations Framework Convention on Climate Change (UNFCCC). Even though the main parts of these reports are about greenhouse-gas emissions (of less relevance for the Red Cross and Red Crescent), they also describe the vulnerability of your country to climate change impacts in the coming decades.

El Niño and seasonal forecasting

Besides climate change, another area for dialogues with knowledge centres is *seasonal forecasting*.

For centuries, people have observed trends and patterns involving rainfall and temperatures. Noticing relationships between events often leads to reasonably reliable predictions. For example, fishermen in Peru have known for centuries that roughly every four to seven years, around December, the waters of the Pacific Ocean become unusually warm off their shores, leading to wetter and warmer conditions for the following months. They call this El Niño, and information about it allows farmers to adjust their planting decisions and improve harvests.

Recent scientific advances have helped us understand relationships between events like El Niño

and seasonal climate conditions. There is abundant evidence of the relationship between El Niño and droughts in various regions of the globe, including southern Africa, south-east Asia and north-east Brazil.

Climate scientists and meteorological services are now developing seasonal forecasts for many regions across the globe, based on observed and projected oceanic and atmospheric conditions. These projections, sometimes months in advance, can provide guidance on various issues from hurricanes to malaria and potentially help millions of people. The Red Cross and Red Crescent can use this information to plan work in food security, health, water and disaster management. The Climate Centre can help with the use of these forecasts and in connecting you to the right institutions.

contact details. This person is a possible entry point for further communication and dialogue with your government.

A first issue for discussion with the focal point is how the disaster-management structure of your country is linked to the development of climate change adaptation strategies. How can the National Society, through its government contacts, engage in climate risk reduction?

Some least-developed countries have written *National Adaptation Programmes of Action* (NAPA). In these documents, governments have prioritized what actions should be taken to make a country less vulnerable to the risks of climate change.

All governments have a *climate change focal point*, often based at the Ministry of Environment or the Meteorological Office. At the UNFCCC website you can find

After initial meetings and information-sharing it is important for the National Society to formulate what it wants to get out of this dialogue in terms of policies, knowledge, improved quality of programmes and mobilization of human and financial resources. This gives the dialogue an agenda and more focus.

With your knowledge about what the government is and is not doing to reduce the risks of climate change you can get a clearer picture of what role you can play to strengthen national policy.

A key responsibility of governments is to raise public awareness about the risks of climate change. The Red Cross and Red Crescent can offer its national network of local branches and volunteers for awareness-raising activities. When some dominant risks are identified, you can help define strategies to address them.

Governments often have a climate change advisory group with civil society actors. The National Society can propose it become a member. Indeed, climate change focal points often treasure the supporting role that national societies can play in reaching vulnerable communities with key awareness and adaptation messages. Be sure to emphasize your grassroots presence in areas government programmes find difficult to reach.

If your country has a national platform on disaster risk reduction in which your National

Society participates, it could be the forum where you can propose discussion of the humanitarian consequences of climate change.

There is a risk that you could get stuck at the national level. You also need to have this dialogue with local governments, particularly in the more vulnerable parts of your country and/or where the National Society already has health or risk reduction programmes. The Red Cross and Red Crescent Movement is in a perfect position to stimulate policy dialogue with local government and to link it to national dialogue, and vice versa. Your National Society can play a major role by ensuring that the discussion properly addresses the challenges and opportunities posed by climate change among the people who are most at risk.

Checklist

- Contact your national climate change focal point to learn about your government's policies on adaptation to climate change.
- Read relevant documents (like the national communications, and NAPA)
- Check if and how the existing disaster-management structure is linked to climate change policies.
- Find out if your government has an advisory group for its climate change adaptation policies. Can the National Society be engaged in this?
- If there is a national platform on disaster risk reduction, make sure climate change risks will be discussed here.

- Identify what the National Society could contribute to the development of national policies on climate risk reduction.
- Invest in a permanent dialogue with government in order to be on top of relevant policy developments.

Pitfalls

Most governments still regard climate change policies as environmental ones and they may not be interested in the disaster risk-management angle of it. Likewise many disaster-management policies do not address climate risks. Don't get discouraged but see this as an opportunity.

Don't get stuck at the national level, support branches to contact their local government on climate risk reduction

Opportunities

The fact that there is often a mismatch between climate change and disaster policies creates the opportunity for the National Society to facilitate a dialogue between the two communities, and thus assist in streamlining these two vital policy areas.

You can engage your network of volunteers and local branches in public-awareness activities on climate change risks.

Dialogue with NGOs, donors and the private sector

Interest in climate change is growing rapidly in many organizations. Yet since the discussion of climate change risks is relatively

new, it can be expected that, like your National Society, they are trying to increase their capacity to understand and address the problem. Because of the magnitude of the issue, no one can address climate change in isolation. Cooperation is therefore a cornerstone of the climate change risk-reduction approach. Resources (human, finance and time) are limited so we have to work together to be most efficient.

Cooperation works best when all parties recognize the similarities and differences in their own agendas. For example, there is nothing against your National Society promoting clean energy (as many environmental NGOs would propose), but the core of our work is to help vulnerable people to help themselves against climate risks like floods and droughts. Companies may want to sell risk-reducing goods and services only in profitable areas, excluding the communities most threatened by climate risks that the Red Cross and Red Crescent cares for. When these different positions are clear and acknowledged, cooperation has more solid foundations and unforeseen partnerships may emerge.

Bear in mind that your National Society can help jumpstart the creation of new partnerships and coalitions on climate change. It can provide substantial credibility, legitimacy or name recognition to emerging collaborative efforts, accelerating the process of awareness and risk reduction.

Checklist

- Identify the organizations which are active or may have an interest in climate risk reduction and find out what they do, intend to do, or are capable of doing.
- Find out whether donors have programmes that can fund climate change work in your country.
- Learn whether actors from the private sector may begin to work, or support work, on climate change issues.
- Find out whether cooperation is possible, for example on public-awareness-raising about climate risks.
- Find out if actions can be complementary. NGOs active in different regions, or working on different but related issues, can strengthen expertise at the local level. For example, the Red Cross/Red Crescent VCA can be combined with the agriculture programme of an NGO.

Pitfalls

Be strong about the National Society's agenda in cooperations. Make clear to the other partners what subjects you're interested to cooperate on (like climate-risk assessments, or targeting the most vulnerable) and what you will not actively contribute to (like a proposal to government about energy-friendly public transport).

There may be pressure on the National Society to take positions on climate change that violate your neutrality, for example on specific government measures to reduce greenhouse gases. Be clear that while you cannot

support these positions it does not need to mean the end of the partnership.

Opportunities

When the partnerships succeed in highlighting what binds, rather than divides, (and climate change has a lot of binding elements) they may result in improved programmes for all partners. For example, a partnership between the meteorological office, the National Society and local radio stations may improve the awareness and early-warning programmes of all.

Programmes from good national and local partnerships may be more interesting for donors to fund.



School bus drives through flooded street during heavy rains in eastern Indian city of Kolkata. Photo: Reuters/Parth Sanyal



Red Cross/Red Crescent Climate Guide
Communications



Communications

The last few decades have brought about a substantial change in our relationship to climate: scientists have more sophisticated ways of finding out what the future climate may be, and we now know that climate change is increasing the risk of disasters.

Recent advances in science and technology have led to a remarkable growth in the development of forecasts that can help reduce the negative impact of expected conditions. With predictions ranging from short-term tropical cyclone tracks to shifts in rainfall patterns due to climate change, humanity faces two new challenges: not just preparing for the foreseeable climate but also modifying decision-making processes in order to incorporate the availability of new information.

Yet the mere existence of predictions is not enough. The predictions need to be *communicated*, and that is a challenge for all, especially in poor countries or among poor communities in rich countries. Hurricane Katrina in August 2005 showed how things can go wrong even if a good forecast is available.

In New Orleans, too many people died because either they didn't receive the hurricane forecast in time, they didn't understand it, they didn't trust it, or they didn't have the means to react adequately – and all that in a major city in the United States.

People must both understand and trust warnings, and they must have the capacity to respond in an adequate manner. The event may be inevitable, but people need to know they can do something about it.

In the year 2000, the Limpopo river basin in southern Africa experienced a very substantial rainfall for many days as a result of unusual cyclones. Experts knew that all that water flowing down the river would result in a flood of enormous proportions, of a magnitude never experienced by rural communities in Mozambique. Yet very few villages were informed about it. Most communities had no electricity or radio, yet people had been able to successfully predict floods by observing ants (these insects build their homes underground, so when groundwater rises they leave their ant nests – and people know that water is rising).

One village was fortunate in that a person who had received the information drove there and told farmers a big flood was on its way and they had to evacuate. However, the local chief asked, “Who are you and why should I do what you say? Since the times of my ancestors, floods have only occurred after ants leave their homes. Now the ants are not moving and you come and ask me to leave?”

Unfortunately the flood came so rapidly there was no time for the groundwater to rise, or for ants to react before the river overflowed. As in most of the Limpopo valley, many people did not evacuate. About 700 people drowned.

The problem was not about knowledge but about sharing knowledge. How can we better communicate what we learn?

The global climate is changing, and the past no longer explains the present. Traditional knowledge is increasingly unreliable because our experience of what has happened before does not necessarily

Shahidul Islam, a Bangladeshi volunteer, taking part in disaster preparedness training in Kalaparam. Photo: Shehab Uddin/ British Red Cross





“Communities know something is happening”

ATAIDE SACRAMENTO, MOZAMBIQUE

apply to present and future risks. Communicating climate change is crucial for disaster risk reduction.

The International Federation believes there are three important messages to convey to people, according to its head of media, Pierre Kremer: “The risk of climatic disasters is increasing; the poor, the elderly and the sick are disproportionately vulnerable; but we can prepare.”

How do we know the future?

In recent years information has increasingly come to be seen as a relief “good” in its own right; communicating as a key humanitarian function. “People need information as much as water, food, medicine or shelter,” said Tony Vaux, an Oxfam veteran who was the organization’s global emergencies coordinator for nearly a decade.

In the context of climate change, Red Cross/Red Crescent staff and volunteers have to rethink how to communicate. While most people in vulnerable

communities have already noticed unusual extreme events taking place, they often explain such events through supernatural forces, such as divine punishment or intervention by angry ancestors. This kind of explanation leads to the belief that things will soon return to normal – or, even worse, to fatalism and inaction. As a Mozambican woman said during a participatory workshop: “If God wants to punish me, I will be punished no matter what I do.”

However, that form of thinking can be changed by access to new information. After learning about the very basics of the climate change process and watching a short video on the impacts of more frequent flooding in Argentina and Bangladesh, the same farmer said: “I thought my community was the only one punished this hard, and that it wouldn’t happen again. But now I see that women all over the world are suffering in similar ways; so maybe it is true that the rains are changing and will continue to change, and maybe I can do something about it.”

Now things are better organized. The cyclone warning system set up by the Mozambican government uses a colour-coded system with flags to label approaching cyclones. A Mozambique Red Cross (MRC) disaster-preparedness programme contributed to the design and implementation of this system. It began by asking communities about traditional forecasting methods, and sharing information about new ways to make predictions. Then a recognizable system was set up, based on radios, flags and whistles for broadcasting alerts. Escape routes and other response options were identified and disseminated at community level. This communication process greatly contributed to minimizing human losses during the next intense cyclones to hit the country.

In early 2007, in her village of Pambara, Anita and her fellow disaster committee members heard official warnings about Cyclone Favio on Red Cross radios. “People didn’t believe us at first that a cyclone was coming,” she says. “They asked how we could talk to God to get news of the weather. So we organized the community into small groups, took a radio to each group and played the government broadcast so they could hear it for themselves.

“We advised them to strengthen their houses, tie down their roofs and keep their children home from school. Houses were damaged but no one died.”

Ataide Sacramento, the MRC’s disaster management officer and head of its climate change pilot project, sees it this way: “Communities know something is happening to them and their environment. They are not waiting for us to come and tell them the climate is changing. They know that. They are waiting for us to come up with solutions.”

But the MRC’s resources are stretched very thinly. The National Society needs more technical staff with knowledge of climate change and risk reduction if it’s to bring climate-risk awareness to all vulnerable communities across the country. The key is to learn how to communicate our new knowledge about future conditions in ways that can be understood and trusted by the communities we serve.

A hurricane from the other side

Diane Turnquest, Disaster Management Officer of the Bahamas Red Cross, thumps the table very gently and points out that she and her colleagues have been dealing with climate change for many years, even if they didn’t call it that.

Turnquest, at a seminar during the Red Cross/Red Crescent June 2007 climate change conference in The Hague, is telling the story of the most recent event to remind Bahamians that all bets are off when it comes to the weather: Hurricane Wilma – one of the “monster storms” of the record-breaking 2005 season (indeed, the most intense Atlantic hurricane ever recorded).

After scything through southern Florida on a north-easterly track, Wilma took the residents of the western end of the island of Grand Bahama by surprise: storms usually travel from the south to the north and skirt the western portion of Grand Bahama, but Wilma came from a different direction. People therefore did not believe the forecast, and when the

powerful storm hit they were caught off guard. Wilma was so large that the entire end of the island got slammed. Residents quickly realized that water rather than wind would be the main danger. A storm surge nearly four metres high swept away scores of homes and claimed at least one life.

Bahamians were left wondering what they could do to protect themselves in the future, but Turnquest says people are better prepared now, armed with the knowledge that the climate is changing and that unusual things are more likely to happen.

The Bahamas Red Cross has embarked on an innovative communications campaign on climate change, which includes everything from video competitions and TV spots to creative work with deaf children in Nassau to promote disaster preparedness and response among people with disabilities.

In Red Cross/Red Crescent terms, Turnquest calls for a “clear international Red Cross mandate” on climate change to help national Societies like hers carry messages about disaster preparedness to their governments.

At the June conference, however, there was a general consensus that the first communications challenge for the Red Cross and Red Crescent was *internal*: to convince leaderships that climate change is something National Societies should be concerned with.

“When we started communicating climate change we did it internally, mainly to an audience of senior managers,” recalls Ethel Kaimila, the programme coordinator of the Malawi Red Cross. “How was it going to affect our programming? Our humanitarian work? What would be the focus and who would the new partners be?”

“Only when we’re comfortable talking about climate change internally in the National Society can we move on to addressing external audiences,” according to Kaimila. Now the Malawi Red Cross is working with the national meteorological service to produce communication materials on climate change that can



“Only when we’re comfortable talking about climate change internally in the National Society can we move on to addressing external audiences”

ETHEL KAIMILA, MALAWI

help subsistence farmers (who are often illiterate) to understand the implications of changing rainfall patterns on agriculture.

Walter Cotte, the veteran head of disaster response at the Colombian Red Cross, has had similar experience: “There was certainly a period of reluctance in my National Society about getting involved in this kind of work – a lot of senior people thought it was all too complicated and we had enough to do already. But then we started getting more and more hit by extreme weather.” Now fully engaged with the issue, the Colombian Red Cross is at the forefront of climate change communication in the Red Cross/Red Crescent Movement, with strategies that range from collaboration with university programmes on communications to puppet shows that change community behaviour through schoolchildren.

For the Red Cross and Red Crescent, standing by while vulnerable people suffer is not an option.

There is *always* something that can be done about the threats posed by climate change. Early warning systems, typhoon-resistant housing, planting trees against storm surges and landslides, and evacuation plans are just some examples of how the Red Cross and Red Crescent, in collaboration with communities, governments and aid agencies, can buttress resilience.

According to Mohammed Mukhier, head of the policy and preparedness department of the International Federation: “For too many years, climate change has been regarded as a predominantly scientific and environmental issue. But we have already witnessed climate change strike at the very heart of our work: It is a humanitarian problem. It’s clear that climate change is something that we can neither escape from nor ignore. We need to pre-empt its impacts and we need to act now.”

Successful action requires effective communication. The global climate is changing, and the Red Cross and Red Crescent Movement needs to change its communication strategy as well.

A farmer walks on a dried-up pond on the outskirts of Baokang, China. Photo: Reuters/Stringer Shanghai



Communications

How-to guide

From the perspective of the Red Cross and Red Crescent Movement, there are three important messages to convey to stakeholders:

- 1 The risk of climate-related disasters is increasing.
- 2 The poor, the elderly and the sick are disproportionately vulnerable.
- 3 We can prepare.

Communicating these messages can be a challenge: climate change is a complex issue, yet it needs to be expressed in simple and effective terms in order to engage Red Cross/Red Crescent staff and volunteers – and the communities they serve.

The following steps should guide National Societies in how to communicate about climate change.

Step 1:

Learn about observed and projected changes in your region.

A first step is to get a better sense of how rainfall, temperature, winds, storms and other weather patterns have been changing or are expected to change. You will need to reach out to people and institutions that have some level of expertise (see *Getting Started*). Sometimes these experts may be difficult to understand (see *Dialogues*).

Your role is to interpret their knowledge and repackage it in ways that can be understood by those that need to learn about this issue.

Collect examples of how other institutions have tried to communicate similar messages. Seek inspiration and advice.

Step 2:

Define your target audience and the transformation you seek.

After you have learned what is changing and what the humanitarian implications of climate change in your country will be, you need to identify your audience. You will need different communication approaches depending on whether you are reaching staff, volunteers, communities or government agencies. Make sure you understand the perspectives and priorities of your audience.

Identify what you want your target group to think or do differently because of your message on climate change. For example, if you're focusing on volunteers in the disaster-management programme, you may want to highlight the need to be prepared for threats that have never occurred before in their community. If you're targeting policy-makers, you might want them to include your National Society in the design and implementation of government

policies and programmes to adapt to climate change.

Step 3:

Tailor the contents and format of your message to the target audience.

When communicating about climate change, you need to bear in mind that there are trade-offs between complexity and clarity. Keep the key message accurate but simple, so the target audience will be more likely to understand, remember and respond.

Keep the message as accessible as possible (see box on page 64). It is better to inspire curiosity and the desire to learn more in the audience, rather than boring and confusing them with complicated terms and difficult theory on atmospheric science.

Enhance credibility by building on the signals of climate change people have already noticed. Whenever possible, use the voice of peers and other people trusted by the audience. For example, if you are trying to reach rural communities, a video with comments from farmers is probably going to be more effective than a video with comments from climate experts.

Consider different options for channels of communication (e.g. oral presentations, flyers, posters, radio, video, drama).

Bangladeshi villagers gathered for an awareness-raising drama, part of a disaster awareness and preparedness programme. As a result of this, the villagers have come together to build bamboo bridges which help evacuate the most vulnerable people. Photo: Shehab Uddin/British Red Cross



Step 4:

Develop communication products.

When designing your products remember that people are being bombarded with messages competing for their attention, from government programmes involving elections to marketing campaigns aimed at selling soap. Your climate change message will be easy to forget or ignore unless it captures both the mind *and* the heart of the target audience.

Be creative: try to attract people's attention through innovative approaches (e.g. through humour, aesthetics, use of surprising tools to illustrate key concepts). Be playful with language and images. For example, a Cayman Island Red Cross volunteer proposed the slogan "Climate change: It's strange!", which captures the essence of the problem, makes people laugh, and at the same time is easy to remember.

Think of this development phase as a process requiring several rounds of testing, correction and reformulation. Whenever possible, engage the target audience in the development of the communication product. Ensure the message is understood and has the desired effect

Select methods of production and vendors based on your constraints and the desired quality of the product.

What communities need to know about climate change

Remember that using multiple communication channels is more likely to get people engaged. Tell people in communities that climate change is caused by the burning of oil, gas, coal and trees all over the world, and that gases are forming a kind of transparent blanket around the world, letting the sunlight come to our planet but preventing the heat from escaping back into space.

The warming of the earth is changing the weather.

The main change is that the weather can become more extreme. When it is raining the rains may be heavier. When it is dry the drought may last longer. Ice and snow on mountains are melting which might at first lead to more water in rivers and then to less (when the glaciers are no longer there). Storms and cyclones may be stronger and go to unusual places, and more rain may fall out of them.

Also the seasons may change. The rainy season may begin earlier or later. Winters may be less cold, but snow may fall in great quantities.

These changes will also have an impact on how plants and animals behave. Insects and pests might come and go in greater numbers.

It is also important to highlight that thousands of scientists all over the world are busy trying to understand what is going on, but because of the complexity of the problem they find it difficult to say exactly what will happen.

We will have to prepare for surprises. But a lot can be done to avoid surprises becoming disasters.

You need not go into all the details of climate change with communities. The different scenarios for climate change developed by scientists for your country may be too confusing.

The question of what should and should not be shared with vulnerable people is likely to be a permanent issue for the Red Cross and Red Crescent. Exchanging experiences with colleagues will therefore be important in years to come.

Step 5:

Disseminate the message.

Ideally, the communication about climate change risks should be part of the general communication of the National Society. That is the most efficient. Nonetheless, once the new climate-related product is finished you have to focus on how to ensure that the target audience is adequately exposed to your message.

Make sure your product is known by the people you want to use it or see it.

Identify potential partners in the dissemination effort. First of all within the organization, volunteers may be the key messengers to the communities. People and institutions from the private sector, government and civil society may assist you in using existing communication channels – radio and TV, distribution in retail outlets, special events.

Find out about the success or failures of the communications effort. Correct and document results to facilitate the adjustment of your communication product for use at another time or in another place.

Checklist

- Educate yourself about the climate change risks for your country and the humanitarian consequences.
- Identify your audience, the message you want to tell them and what you expect them to do differently.

Relating weather events to climate change

The best understood messenger of climate change is the climate itself. When unusual weather occurs (not always leading to a disaster) and everybody talks about it, this is a good entry point for further communication on climate change.

Be aware that no single disaster or strange weather event can ever be said to be caused by climate change (most extreme events could occur even without climate change, although they wouldn't be so likely to happen). What we can say is that a particular event fits the pattern of rising risks due to climate change.

When you make such a connection to climate change, you have to be sure that you have the support of climate experts in your country, otherwise what you say on climate change risks may not be trusted.

When an extreme-weather situation leads to a disaster the sense of urgency is felt a lot more strongly. But be careful: we often prepare for the last disaster, while the next disaster related to climate change may be something completely different. After a flood, we may all work hard to reduce flood risk, but the next disaster may be a heatwave or a drought. It is important to highlight this in your communication.

- Make sure your audience understands what you want to tell them.
- Be creative in how you communicate.
- Make sure your message reaches your audience, and use the internal and external network of the Red Cross and Red Crescent.

Pitfalls

Within the certainty of climate change there is a lot that remains uncertain. People may want to get information from you about climate change that you don't

have because it does not exist. Or they seek confirmation from you about any sort of strange weather. Climate change may very quickly become the explanation for everything new that is happening. Don't allow this to happen.

Communicating the uncertainties about climate change is the most difficult part of the job. People tend to lose interest when you cannot give clear answers to the many questions they may have. Clear answers are often wrong answers. Try to convince people

that the uncertainty about the exact nature of climate change is what we need to prepare for.

What we often *do* know is that risks are rising, even if we do not know exactly how.

Opportunities

Use an event related to climate change (such as extremely heavy rainfall) in a smart way.

Further information

All information from this guide is available on www.climatecentre.org, including updates and links to further information and examples on how to communicate about climate change. In addition, for major disasters the Climate Centre mailing list often distributes information on connections to climate change.

The International Federation also has a media package on climate change, containing key messages for National Societies.

Examples of communication strategies used by National Societies working on climate change

Videos and television

Antigua and Barbuda, Argentina, Bahamas, Cayman Islands, Jamaica, Malawi, Saint Kitts and Nevis, Samoa and Viet Nam

Radio programmes

Trinidad and Tobago, Hier Red Cross/FreeVoice project Latin America

Community outreach programmes

Argentina, Tuvalu, Samoa

Theatre

Colombia, Samoa, Fiji, Kiribati

Puppet shows

Colombia

Events

Indonesia (World Red Cross and Red Crescent Day); Tuvalu, Solomon Islands, Tonga, Kiribati (World Disaster Reduction Day, World Environment Day)

Message boards, banners

Bangladesh, Colombia

Educational programmes and material for schools

Nicaragua, Trinidad and Tobago, Tuvalu, Samoa, Solomon Islands

More information on these and other examples is available on the Climate Centre website www.climatecentre.org

A Red Cross volunteer in Ikaatini, Kenya at meeting with villagers to discuss water supply. It's in a part of the country severely affected by drought. Photo: Daniel Cima/American Red Cross





“ARID AREAS ARE BECOMING DRIER STILL”

Case Study: **Africa**

Scorched landscapes, withered crops, dried-up rivers and lakes; or the opposite – devastating floods; dying livestock, hungry people. This could be the picture we face in Africa in a decade unless we manage climate risks better.

New research suggests that the vulnerability to the climate-change threat is in Africa greater than in many parts of the world. And the changes won't be limited to a rising average temperature and changing rainfall patterns. Droughts and floods are happening with increasing severity and frequency, accompanied by diseases such as diarrhoea. Malaria is also making an appearance at altitudes that previously had no mosquitoes, such as in the mid-highlands in Ethiopia. Rift Valley Fever has reappeared.

Changing weather patterns in recent years are having a detrimental impact on food security; farmers are finding they can no longer plant or harvest their crops as they used to for centuries as rainfall is late or erratic.

Communities are vulnerable to unfamiliar hazards and cannot cope with even minor shocks – leading to a constant rise in the numbers of people needing humanitarian assistance. The average number of food emergencies in Africa per year has almost tripled since the mid-1980s, and in the last year alone 25 million people faced a food crisis.

Africa, with its resources already overstretched, has little capacity to deal with further disasters from climate change. Around 90% of people depend on agriculture for their livelihoods – many are subsistence farmers who only grow enough food to feed themselves and their families. Any decrease or change in rainfall patterns could mean crop failure and consequently serious food shortages or even famine.

Agricultural production will be severely impacted by climate change – the area suitable for agriculture, growing seasons and yield are all expected to decrease. This would further adversely affect food security and exacerbate malnutrition in some countries.

The yield from rain-fed agriculture could be reduced by up to 50% by 2020, according to scientists on the Intergovernmental Panel on Climate Change (IPCC). Many parts of Africa are already considered “water stressed” – something that will be exacerbated by climate change.

Any significant rise in temperature could also seriously affect cash crops such as tea or coffee. Arid and semi-arid areas all over Africa are becoming yet drier. On average the continent is 0.5 °C warmer than it was 100 years ago, in some parts even more.

Migration is another outcome of climate change as people move away from drought-prone areas and work as labourers on other farms to earn money to buy food, increasing pressure on particular parts of the continent.

Ethiopia

Divided by the East African Rift Valley into highlands and lowlands, Ethiopia has an extraordinarily diverse climate, from the cool and rainy Dega highlands to the Danakil depression – one of the hottest, driest places on Earth.

The economy is based on agriculture, which accounts for half GDP, 60 per cent of exports and 80 per cent of total employment. But only 1 per cent of farmed land is irrigated and drought can throw the whole country into crisis and food shortage.

According to Abebe Tadege, head of research at the national meteorological office in Addis Ababa: “There have been signs of climate change in Ethiopia since 2000, and even before. Tropical Africa is a hotspot for precipitation changes. I am very worried. What is the impact on crops, on *tef* [the traditional staple], tea, coffee, livestock?”

With five major droughts in two decades, many families have not had time to recover and hundreds of thousands of people live on the brink of survival every year.

In 2000–3, 46% of the population were malnourished, according to the Food and Agriculture Organization.

Meanwhile 2006 saw some of the worst floods in Ethiopia's history, displacing people all over the country. Flash floods in Dire Dawa, the second largest city after Addis Ababa, killed nearly 250 people and displaced thousands.

More than 400 people died during outbreaks of acute watery diarrhoea in 2006. Fadis, in the east, has been badly hit by drought. Many farmers have suffered from poor harvests year after year due to erratic rainfall. In recent years the rains have failed completely.

Yusuf Idris, a village elder, has lived in the area for 40 years and his family and community are regularly dependent on relief food. The rains have failed consistently for the last few years and he cannot plant his crops. “When there is a little rain, we can plant sorghum and maize but we don't produce much,” he says.

The nearby River Boco, which used to be one of the main sources for irrigation in the area dried up several years ago, partly because of the lack of rainfall. Yusuf remembers orange and lemon groves beside the river. He reports that many people in his community migrate every year because of drought, and scarcity of food and water.

Malaria

A few kilometres away near the town of Harar, Lake Halamaya also dried up several years ago, partly because of the scarcity of rainfall in the region. Lake Halamaya, about five kilometres long, was the main source of water for Harar and the surrounding communities and provided income for fishermen.

Fatiya Abatish Jacob is a local trader who lived near the lake for 14 years: “I used to get my drinking water from the lake, now I have to walk eight kilometres to get it. Also there were many vegetables farmers round here using the water for irrigation and we used to get fish. Now there are no fish around here and vegetables are more expensive.”

And while there was drought in Harar area to the south there were bad floods in 2006 in west Shoa, where 3,000 people were displaced. “Such heavy flooding hasn’t happened for 40 years,” says Tiringo Engdawork, Ethiopian Red Cross Society (ERCS) branch secretary. “It destroyed houses, crops and cattle.” Local malaria rates have shot up.

ERCS disaster preparedness emphasizes clean water and tree planting for wood, fruit and terracing. Gabriel Aebachew, head of organizational development, believes that they have to now “create awareness of climate change, collect data and train volunteers” at branch level.

According to relief officer Geude Beyenne: “We have volunteers trained in disaster preparedness activities in every part of Ethiopia. We started two years ago because we realise we are affected by natural calamities more frequently. We are trying to prepare relief materials such as blankets and jerrycans and store them in various regions. The policy now is that 10% of branch income will go to supplies for preparedness activities.”

The ERCS has also placed considerable importance on the need to conserve water. Rain “harvesting” is an efficient way of collecting clean water during the rainy period and it can last several weeks or months.

“In Moyale, for example, in the south, there is no river and so rainwater harvesting is important,” Geude Beyenne explains. “Water is key, especially in disaster preparedness. Some people in the south might only use a litre a week.” More than 50 rainwater harvesting tanks, on roofs and underground, have been built in the last two or three years.

The ERCS also has a programme of community-based health care for awareness-raising and education, but this will have to be scaled up in the light of climate change. Malaria, typhoid, cholera and diarrhoea are all diseases that spread more rapidly during times of hardship.

Diseases that were considered to have been eradicated are also making a reappearance. In 2006

Acute Watery Diarrhoea cases were recorded for the first time in ten years. And there is clearly interaction between malnutrition, malaria and HIV/AIDS.

Rwanda

Despite a decade of rapid economic growth, poverty remains widespread in Rwanda. Known as the “land of a thousand hills”, Rwanda is a small landlocked country surrounded by Burundi, Tanzania, Uganda and the Democratic Republic of the Congo. But despite its size, it has very diverse ecosystems.

Rwanda forms part of the Great East African Plateau, which rises from the lowlands in the west that are characterized by swamps and lakes to the highlands of the east. This divides the country between the Nile basin and the Congo basin. The climate is moderate and tropical, with a short dry season from January to February and a long dry season from June to September.

Parts of Rwanda have been hit by persistent drought over the last few years, rainfall patterns have been erratic with the result that, again, farmers are confused as to when to plant and harvest. Musoni Didace, director of the country’s meteorological service says climate change is “clearly visible” from the rise in minimum temperatures in the last 30 years of up to two degrees.

Indeed 2005, was the hottest year for many years in Rwanda. Temperatures in the capital, Kigali, soared to 35 °C. Higher temperatures also mean the spread of diseases such as malaria, already the principal cause of morbidity and mortality in every province.

The interaction between diseases is also of concern: someone with malaria, for example, will be more prone to catching HIV, and vice versa. Malnutrition also means diseases spread more rapidly. It is a vicious circle. And diseases thought to have died out, like cholera, are reappearing. New cholera cases were recorded for the first time in Kigali in 2006 and in the north-east in 2007.

The agricultural sector is central to Rwandan environment. It dominates the economy in terms of contribution to the GDP and it also accounts for over 90% of employment. Agricultural exports represent over 70% of the total; coffee and tea are the two main export crops. Climate change could have serious consequences for agricultural production.

In 2006, there were a number of deaths as a result of heavy rain and floods, and crops and livestock were destroyed. Patricia Hajabakiga, the environment minister, said this affected the national budget as money intended for economic development was used for emergency measures such as buying food relief.

At the same time water levels have gone down and hydroelectric stations, particularly in Ntaruka and Mukungwa, have been affected. Electricity generation has declined and there has been an energy crisis in the last few years; to produce electricity the government has had to buy generators costing millions of dollars. This had an impact on the population – with the price of electricity tripling.

Migration

Bugusera, in southern Rwanda, is an area that has persistently been hit by drought and here around 40% of people lack secure sources of food. Many farmers in this area have suffered from bad harvests due to late or erratic rainfall.

Mary Jane Nzabamwita is a farmer in Gashora with five children to feed. Since 1998 rain has become unpredictable. “We think it will rain, then it doesn’t rain and then we lose our harvest,” she explains. Mary Jane grows sorghum, beans, sweet potatoes and vegetables, some of which are sold at the market but last year her harvest was down by half.

She just managed to save enough money to send her children to school (the children get food from the World Food Programme at school), but she cannot afford to pay for health insurance fees for the whole family. The family now has to drink water from the nearby swamps and continually suffer from diarrhoea and malaria.

“I feel like I am going backwards,” she says. “The children are not doing so well. When you see a child of ten, you think he is five.”

A Rwandan Red Cross Society (RRCS) volunteer in Bugusera explains that you can now see more erratic climate patterns and drought is making people migrate to other areas of Rwanda where they can work. People might also go to a nearby town, earn some cash there by petty trade and buy some food to sell in their own villages.

Many families are separated. Mimi and Josephine are looking after their children and their farms while their husbands have gone elsewhere to earn some cash. This year their maize crops have failed due to lack of rainfall and they are still hoping for rain for their bean harvest. If they fail or come late, they do not know how they are going to get their food.

Migration became such a serious problem that almost 80% of the people in the area left their farms to look for work in other regions between 2003–5. However, the local government has tried to stockpile maize, sorghum and beans and migration has now decreased, according to Viateur Ndavisabye, executive secretary of the Gashora regional government.

“Climate change is a big problem,” says Apollinaire Karamaga, RRCS secretary general. “We need to train volunteers with basic skills, like being able to advise farmers when to sow seeds, dig the swamp, and so on. We need to help them think, ‘What can I do according to my realities to cope?’”

According to Marie-Antoinette Uwimana, RRCS head of programmes: “The government has started talking about climate change this year, and as we are a member of the disaster management task force, we discussed this with them.” There is now a realisation that disaster response is no longer enough and that risk reduction is important and has to be scaled up.

“The impacts from climate change are there and have been problems in the last years,” according to Eric Njibwami, head of volunteers. “The eastern and southern regions suffer from lack of food because

of the long season without rain.” The result is that communities can no longer plan harvests or planting because of erratic rains.

The RRCS tries to address this by informing people when they are going to have a drought, getting weather information and warning people to keep a stock of food. But in the long term, says Eric Njibwami, people have to “diversify through business activities or generating other incomes”.

A major problem is that farmers are very traditional and hesitant to change, says Karamaga. “We may need to change our crops or diets in the future, but people change only very slowly.” He believes it’s important to train volunteers to train farmers to move away from their traditional methods of producing crops, which may not be the most efficient in today’s circumstances.

Clearly water management and environmental protection of land is going to be key. Due to population pressure much of Rwanda has been deforested – with resulting soil degradation and erosion which worsens the impact of drought. Almost 90% of the population use wood as cooking fuel. Mobilising the community to plant trees is, therefore, an important objective for the Rwanda Red Cross. The eventual aim is for every district to have a nursery with 10,000 seedlings.

Swamps

Rwanda not only has numerous hills but also numerous swamps at the bottom of the hills. In the past many of these were not cultivated because of the expense of drainage and managing the swamp. However, given the pressure on land and more erratic climatic conditions that affect crops traditionally grown on the hillsides, developing swamps would provide new arable space, for beans, rice or cassava.

Underground water also means that agricultural production is less dependent on rainfall and can survive periods of drought.

The RRCS has one such project which began several years ago – some 10 hectares of the Agatenga swamp are now successfully cultivated, providing beans, cassava and rice to nearby communities.

This part of Rwanda has been hit by drought in the last few years and up to 30% of the people are food-insecure. Developing projects such as this is part of the RRCS strategy to promote the capacity of local communities to cope.

Emmanuel Munyentwari is one farmer who works there. He has his own plot of land on the hillside but there he is more dependent on rain. “Last year rain was expected in September but it came only in November,” he says, “so we couldn’t plant until November and people had little to eat – there were food shortages.” But the extra crops that he grows in the swamp project are useful. His own harvest is low and he is really not growing enough food to eat. His dream, he says, is that one day he will be able to afford school fees to send his wife back to school. “The Red Cross did a good job here,” he adds, “and I hope it can expand.”

Training volunteers and mobilising the community is key to dealing with climate-change impacts. Yvonne Kabagire is a communications officer at the RRCS and is also a radio presenter with her own 15-minute programme, Rwanda Red Cross Humanitarian Action. Every week she covers subjects such as HIV/AIDS, the environment, drought, floods and disasters, and commands an audience of no less than 70% of the entire population of Rwanda.

Kabagire sees radio as an important tool in disseminating information on climate change. “People need to know about it because our country is not an island,” she explains. “They need to understand the phenomenon and how they can have a role in building coping strategies.”

After a long drought which killed livestock in Kenya, floods took what was left. This man lost most of his goats and sheep.
Photo: International Federation of Red Cross and Red Crescent Societies





Red Cross/Red Crescent Climate Guide
Disaster Management

Disaster Management

When disaster strikes the Red Cross and Red Crescent responds as quickly as it can to the maximum extent resources permit.

Disaster response has been a core function of the Red Cross ever since the 1880s, when the American pioneer Clara Barton published her pamphlet advocating assistance to victims of “plagues, cholera, yellow fever and the like, devastating fires or floods, railway disasters, mining catastrophes, etc.” as well as work in wartime.

Reducing the impact of future disasters through *disaster preparedness and risk reduction*, is a more modern concept and inevitably involves a certain amount of prioritizing.

But what if the future is radically different from the past? And in ways that cannot confidently be predicted? What if 21st-century climate change impacts mean not just more serious disasters, like more floods, but also unfamiliar ones, like “killer” heatwaves in northern Europe and two Category-5 hurricanes making landfall in the Americas in one season?

The sobering reality facing many National Societies around the world is that the whole field of *disaster management* – humanitarian action both before and after an event – may be changing rapidly in a process that took hold as recently as a decade ago.

The Red Cross and Red Crescent have traditionally focused on response. But now other aspects, including the relatively new concept of *risk reduction*, are also given priority in what is called the “disaster-management cycle”.

The International Federation’s 2002 *World Disasters Report* argued that preparing to respond to disasters is only part of “risk reduction”. “Where possible,” the report said, “measures to reduce the physical and human impacts of disasters must be taken”. In the Caribbean, where hurricanes are a fact of life, enforcing building codes is essential, as it is everywhere. In low-lying coastal states like Bangladesh, where disastrous flooding is already a fact of life, the provision of sturdy cyclone shelters becomes even more important.

The concept of “natural” disaster itself also throws up definitional issues, particularly in the age of “human-induced” climate change. “Disasters” (except industrial accidents), in fact, are just what happens when natural events such as earthquakes, tsunamis, storms, floods, droughts collide with people. And it is where and how they live that determines the scale of the disaster, not just the size of the “natural” hazard.

The relatively new concept of the complex disaster has also been identified: this might involve interlocking factors like unemployment, poverty, tuberculosis and extreme cold after the socio-economic collapse seen in parts of the former Soviet Union; HIV, drought and deforestation in southern Africa; or population growth, unplanned urbanization and intense rainfall events all around the developing world.

Climate change itself will create complex disasters: rising sea levels combined with more intense storms will lead to much more destructive storm surges, and droughts that are rapidly succeeded by floods and insect plagues will be more devastating.

Wang Huai Min sits on a make-shift raft that he uses to visit his submerged house during the July 2003 floods in China.
Photo: Thorir Gudmundsson/International Federation



Another distinction often made to try to order priorities in the humanitarian world is between “sudden onset” disasters, especially seismic events like volcanoes but also climatic events like storms, flash floods and even heat waves, and “slow onset” disasters like drought and famine.

And yet a further major variable, of course, is the amount of *publicity* disasters get – often a function of how easily they can be covered by first-world TV crews. This is vital to the work of enlisting donors. Hurricanes get more publicity than most disasters, particularly when they affect the United States.

The future will be different

The most recent scientific report from the Intergovernmental Panel on Climate Change (IPCC) said it is *likely* that future tropical cyclones will become “more intense”, with higher wind speeds and heavier rain.

The number of hurricanes in the North Atlantic has been above average in nine of the last 11 years, and the evidence suggests substantial increases in intensity and duration since the 1970s. Recent studies even show that on average about twice as many Atlantic hurricanes now form each year as a century ago. Yet the behaviour of hurricanes, and especially the track they follow over the surface of the Earth, is far from easy to predict.

It is important not to label individual extreme-weather events as “climate change”. Instead, we can recognize the trend of which they might be a part, and the rising general uncertainty and risk. Hurricanes are a good example. Possibly the only thing we know for sure: the future *will* be different from the past.

This was much the situation that confronted the Colombian Red Cross (CRC) when, towards the end of the record-breaking 2005 Atlantic season, Hurricane Beta bore down on the islands of Providencia and San Andrés in the Caribbean. Walter Cotte, the CRC’s veteran head of disaster response,



“The next emergency will just be the next rainy season”

WALTER COTTE, COLOMBIA

remembers it as a “turning point” for people’s attitude to new climate risks.

The National Society, fully integrated into Colombia’s national disaster response system, had been attending the emergency meetings as the hurricane approached and put its own branches on alert as soon as the authorities issued a storm warning.

“Hurricanes normally sweep north of us,” Cotte points out. “Climate change has become an issue now in the whole of Colombia’s Caribbean region – not just the coast itself – in a way it wasn’t before. And especially our islands, where people think they’re threatened and need to prepare.”

Never before had the Atlantic seen a total of 27 named tropical storms. The normal alphabetical list of innocent-sounding tags – *Arlene, Bret, Cindy, Dennis, Emily, etc.* – had to be extended in 2005 with Greek letters, starting with Hurricane Alpha on 22 October and ending with Tropical Storm Zeta which, for only the second time on record, lasted into the new year. The infamous 11th named storm of the season, of

course, had set a new record for economic damage and destroyed a US city: Hurricane Katrina. The trend seems likely to continue: the 2007 season was the first one on record to have two hurricanes making landfall as Category-5 storms.

So the big question facing the Colombians now is: how frequent will this new hazard prove to be? According to Cotte: “For ordinary people what they perceive as *variability* in the weather is the problem, rather than climate change as a trend.

“Our effort at the moment is focused on four areas: raising people’s awareness of climate change as an issue; acting as a facilitator for the work of private and public sectors and the local communities; helping deploy development aid at the local level in micro-projects relevant to climate change; and above all *advocacy* on behalf of vulnerable people.”

Catalysing preparedness

Latin Americans have little choice but to manage climate-related disasters. The Caribbean and Central America lie in the Atlantic and Pacific storm belts. And mountains and intricate river basins generate lethal mudslides and floods. But also the reverse is happening: some regions face drought on an unprecedented scale.

Climate change is among the many socio-economic processes like land use patterns that increase the risk of disasters. Because of simple poverty, people in Latin America often inhabit cheap land that is prone to natural hazards, greatly increasing their vulnerability.

“I’ve been involved in disaster management in Colombia for a long time,” Walter Cotte recalls, “and I can say confidently that the last five years have seen a very sharp rise in the number of people affected by floods and the amount of damage they cause. No doubt. They happen more often and sometimes the two rainy seasons join up and make one!”

“Right now there are at least half a million people affected by floods in Colombia. It’s a big emergency but the national system can cope, for now. The real question is how to solve the problem for good. The next emergency will just be the next rainy season.”

In the Latin American context particularly, torrential rain and floods as well as earthquakes and volcanoes generate another indirect but no less deadly effect of weather extremes: landslides. Many millions of Latin Americans live in poor conditions in hazard-prone areas, at the foot of unstable mountains, along river banks or in low-lying areas liable to flooding. Urbanization and deforestation make the problem worse.

Precisely because of the growing vulnerability to weather extremes of Latin America and the Caribbean, work has begun to integrate the new awareness of climate hazards into the regular disaster management cycle in a programme funded by the Dutch lottery. The Red Cross is leading implementation in Guatemala, Nicaragua, Costa Rica and Colombia while “Free Voice” – a Dutch communications NGO – covers the Dominican Republic and Haiti.

The programme’s objective is to get across the idea that the future will bring new risks. There has to be better planning at every stage of the disaster-management cycle, better use of weather forecasts – a key component of any early-warning system, and better use of seasonal forecasts of hurricanes, droughts and El Niño/La Niña effects.

The key message: climate change *can* catalyse better disaster preparedness by encouraging the incorporation of new information and leading to more effective operations.

One community in Guatemala is among many who have taken this message to heart. The village of Santa Rosa, in the department of Chiquimila, has already been relocated once, before the second world war, because of the landslide danger. And when cracks started to appear in the hills above them the villagers, who survive mostly through subsistence

agriculture, realized the same thing might have to happen again.

The inhabitants of Santa Rosa are only too aware of the risks they face, and at their own request have now been included in the climate change project and are involved in the setting-up of a local disaster reduction committee and preparedness training.

Indonesia: a disaster a day

On the other side of the world another intensely disaster-prone country presents a similarly daunting array of seismic, climatic and man-made risks: Indonesia.

The seismic risk in the Indonesian archipelago is legendary, as demonstrated by the devastating 2004 tsunami. Yet the risk of extreme *weather* is not to be underestimated either. On 8 May 2007, World Red Cross/Red Crescent Day, the Palang Merah Indonesia (Indonesian Red Cross) chose for its national focus “adapting to the consequences of climate change” to highlight the National Society’s work in disaster preparedness and risk reduction.

The PMI’s Bevita Dewi Meidityawati – speaking in June – remembers: “When I was in school I was told rain came between September and April and the dry time was from May to August. But it’s changing. We have just had a whole month of rain. Every five years we have a big flood in Jakarta. It gets bigger. The 2007 floods lasted longer and were more costly. In 2006 we had [weather-related] disasters every month.”

Putting together climatic and seismic disasters and man-made transport and industrial accidents, it is only a slight exaggeration to speak of a disaster a day in Indonesia.

Peter Rees, head of the operations support department at the International Federation in Geneva, points out that the International Federation has taken steps in response to the increase in disasters



“When it rains it floods and that kills people. When it doesn’t rain there’s a drought and that kills people too”

ABDISHAKUR OTHOWAI ABDULLA, KENYA

in recent years: “We have increased our investment in early warning systems and reinforced our contingency planning on a national level.

“We’re scaling up the pre-deployment of relief items, such as blankets and tents,” he adds, “and increasing the capacity of our Emergency Response Units, which are made up of teams of specialists on standby to be sent to disaster zones. With a changing climate, we need a stronger capacity to respond in an adequate and timely manner.”

Complex disaster in Kenya

Kenya is one of many countries where climatic extremes – especially flood and drought – seem to overlap, then become embroiled with human factors like deforestation and migration to produce virtually permanent disaster conditions.

In 2007 the Kenyan Red Cross (KRC) began a major livelihood-recovery programme to support farming

and fishing families hit by massive floods at the end of 2006, just as they were still struggling to recover from severe drought.

Amidst the more familiar after-effects of flood, the price of food “soared beyond the purchasing capacity of many families,” according to Abdishakur Othowai Abdulla, KRC drought project manager and a vocal Red Cross advocate of climate preparedness in Africa.

In a phrase, he says, the weather is “upside down”.

“In the months that used to be rainy there may not be rain. The winters that used to be cold are no longer cold. When it rains it floods and that kills people. When it doesn’t rain there’s a drought and that kills people too.”

“The farmer will tell you that they plant and it doesn’t rain and they lose their seeds. After the crop has sprouted it is supposed to rain continuously until the crop matures, and when the crop matures the rains are supposed to stop. But it doesn’t happen like that any more. Or it may rain just before the farmer is due to harvest and the crop rots.

“Once people would have said this was an act of God, but it’s been going on for ten years they’re saying the weather has changed, the climate has changed. There is no single, normal season, no cropping season.

“Our policy now is to tell people that we have to adapt because this phenomenon will be with us for a very long time.”

One contribution the Kenyan Red Cross has developed is its ingenious “de-stocking” project. The National Society buys cattle in poor condition during drought and slaughters them for meat, enabling farmers to save the money they earn. Healthy cattle are then sold back to farmers once the drought abates.

Othowai Abdulla adds: “The traditional Red Cross role is blood, ambulances, giving people blankets

after disasters. But we also have to move to safeguarding livelihoods as well as lives.

“In all our work we are making livelihoods an underlying priority. Protecting livelihoods has to be part and parcel of emergency relief.”

Disaster Management

How-to guide

Disaster management (DM) is one of the core functions of many National Societies: saving lives and assisting people hit by disasters, as well as preparing to respond to future events and reducing people's vulnerability to expected hazards. Due to climate change, these National Societies will face more and larger operations, and disasters of a different nature, adding up to greater demands on their capacities. They may face increased health risks, diminished food security and water supply, and even increased migration and displacement.

Risk-reduction activities and early-warning procedures need to be adapted to the changing hazards, including the need to communicate them effectively to the people at risk. Although somewhat beyond the scope of most National Societies, increased efforts will also be needed for recovery and reconstruction from more frequent, more intense, more unfamiliar disasters.

But climate change also brings opportunities. It can and must act as a catalyst for better disaster management, especially because more people realize that we also need to invest in disaster preparedness to cope with the rising risks.

This section outlines how to integrate the changing risks

into regular DM operations. The guiding principle is *integration*: climate change is not a wholly new or separate risk, but one additional factor on top of many others that determine the disaster risk in a particular country or community. In that sense, climate change is mainly a *planning* issue. It affects priorities and plans, and may prompt the national society to increase its efforts or refocus its activities.

But the kinds of specific assets and activities needed to respond to or prepare for disasters – such as emergency stocks, shelters, community-based early-warning systems, communication tools or networks of volunteers – remain largely the same.

Step 1: Collecting general background information.

The first step is to know what you are dealing with. Understand the changing risks that your country may be facing. This is typically done as part of the national climate risk assessment (see *Getting Started: How-to guide, step 3*). Where possible, such information could also include risk maps of the country, identifying hazards and vulnerable areas. Also, when this is available, information from community-based Vulnerability and Capacity Assessments (VCA) could be included.

At this stage, the National Society should already have designated a focal point for climate change, who will be responsible for the integration of the changing risks into DM programmes, and who will be in charge of some of the planning in step 2.

Step 2: Assessing priorities.

Most National Societies' disaster management strategy will include prioritization of resources and target areas. Climate change should be factored in. This may sound complicated, but actually it is not. Once you have information on how risks may be changing (from step 1), you do not need complicated guidelines or external experts to tell you how to deal with the changing risks: your staff and volunteers are the experts in terms of the implications.

To start with, you should check your National Society's key DM plans. For instance, check the following questions using the information from the climate-risk assessment and possibly risk maps (see *step 1*).

On a strategic level:

- Are you prepared for the all disasters that can be expected?
- Are you prepared for them in all parts of the country?
- Are you focusing on the most vulnerable groups?

Local Red Cross workers were among the first on the scene in February 2006 after a landslide killed more than 1,000 people in the Philippine village of Guinsaigon. It followed torrential rain falling on the embankment visible in the distance. Photo: Rumulo Godinez/International Federation of Red Cross and Red Crescent Societies



- Are you aware of new diseases that may arise during disasters (see also *Health and Care*)
- Are you aware of new threats to food security?
- Are you aware of new potential conflicts, for instance due to increasing pressure on natural resources?

On an operational level:

- Are you making use of short-term weather forecasts, seasonal rainfall forecasts, and long-term climate change projections?
- Are you including the changing risks in training activities?
- Are you informing communities about the changing risks and taking them along in preparedness programmes?

If you are using the guidelines for a Well Prepared National Society, it would be good to go through these questions with your National Society's national climate-risk assessment in mind. Again, climate change requires nothing new; it just adds an additional element to your self-assessment.

These questions should be discussed in regular planning meetings involving the key DM staff. In some cases, the answers may just alert you to pay additional attention to some hazards in the context of what you are already doing. In other cases, it may be a reason to start new programs, for instance to increase the volunteer base. Among others, they may include the specific activities suggested in step 3, below.

Step 3:

Action.

- *Enhancing preparedness to respond.* Response capacity may need to be adjusted to account for new and rising risks due to climate change. Activities should be planned using regular National Society and International Federation tools, such as the Disaster Management Information System (DMIS) and your national climate-risk assessment. This may include modifications to things such as contingency planning; location and number of warehouses with response and relief stocks and mobilization and training of a sufficiently large volunteer base.
- *Enhancing disaster risk reduction.* For many National Societies, true risk reduction is strongly rooted at the community level (see the module *Community risk reduction*). In some National Societies, larger risk reduction programmes, such as mangroves along the coast of Vietnam to reduce the risk of flooding, have been very successful. In many cases, similar solutions will be effective to address the rising risks from climate change. Keep in mind that vulnerability to climate change is often caused by many factors, such as people living in unsuitable places, deforestation and destruction of beaches. Addressing these underlying factors can then help to reduce the impacts of the rising hazards.
- *Enhancing food security programmes.* Climate change affects people's livelihoods

and food security, directly by changes in temperature and rainfall patterns, or through changes in extremes. Food security programmes should take account of the way climate change may affect the risks facing vulnerable parts of the rural population. Simple solutions may be available, such as drought-resistant crop varieties or even changes in soil management practices. Again, the background information collected in your National Society's national climate risk assessment should contain the key information, which can then be integrated in planning documents for food security programmes and early warning.

- *Enhancing early warning.* As the climate changes, people may find that they can no longer "trust" the weather or recognize hazards as they used to. This creates an additional need to use weather forecasts better – at the National Society planning level and also by communicating them to communities at risk and ensuring that people really understand and trust the information. Be mindful of the chain of efficient early warning: risk knowledge, monitoring and warning services, dissemination and communication, response capability of people at risk. Climate change does not really alter the way a National Society should organize such chains. But it does increase the importance of such activities in the face of rising uncertainties about the weather.

Regular weather forecasts are provided from hours up to two weeks in advance. In recent years, the quality of so-called seasonal forecasts (one to six months of lead time) has also improved tremendously, for many regions. While they are not infallible they can really help a farmer know whether a rainy season is more likely to start late or be relatively dry (see *box on page 50*). Besides the forecasts of temperature, rainfall and storms, many institutes also provide forecasts for specific threats, such as the risk of health epidemics, locusts or food security problems.

Make sure you are aware of such information for your country. The national meteorological office may be a good starting point, and the Climate Centre can also help you identify the right institutes for your region. At the global level, the DMIS also provides a number of monitoring tools and links.

- *Enhancing advocacy and partnerships.* Effective DM requires close cooperation with governments and many other actors, including other emergency-response agencies. Specific guidance on advocacy and partnerships is included in the module "Dialogues".
- *Enhancing awareness-raising among vulnerable groups.* Awareness raising about new risks can be a key role of the National Society, using its network and trust at the

community level. Methods may include drama, school programmes and media. Specific guidance is included in *Communications*.

- *Capturing local information.* Complementing awareness raising by telling communities what is known about changing risks at the national and global level, the National Society should also listen to local perceptions and observations of changes in the weather (see *Community risk reduction*). Such information can be an invaluable planning tool, particularly in areas where scientific data and analyses are scarce and of poor quality.
- *Enhanced training.* Regular DM training for staff and volunteers needs to include information on the way risks are changing. The Climate Centre can provide standard formats and presentations, which you will need to adjust to your circumstances.

Step 4:

Evaluation

At least once a year, National Societies should evaluate the risks they face. This process needs to be continuous. Have new and/or unusual disasters been occurring? New diseases, new conflicts? New reasons for crop failure and food insecurity? How has the National Society dealt with them? Any need to update plans, start new activities, recruit more volunteers?

Such questions immediately refer back to steps 1 and 2: updating

background information, and assessing priorities.

In addition, National Societies should document success stories. For instance, if awareness about climate change has helped to recruit new volunteers in one district, such a strategy may also work in other parts of the country, and even in other National Societies. The more such examples are shared and replicated, the faster we will be able to expand our coverage in dealing effectively with the changing risks.

Checklist

- Ensure your National Society has a climate change focal point who can coordinate the integration of climate change into DM activities.
- Assess your National Society DM plans and programmes in the light of your national climate-risk assessment, and establish priorities. (What needs to be done differently? Where do we want to focus?)
- Act!

Pitfalls

Don't get overwhelmed by the many aspects of climate change. Just get started by realizing that the past no longer explains the future. Planning for climate change is not something new and complicated – at all times it should remain rooted in your own priorities and understanding.

Opportunities

Climate change can be a catalyst for better DM. It may help to take a fresh look at your plans and

programmes and integrate new information and vulnerabilities. It may also make it easier to mobilize new volunteers and establish partnerships with governments, donors and other stakeholders.

The Red Cross and Red Crescent is well placed to address risk related to climate change. Climate change is a global problem with local impacts. The Red Cross and Red Crescent is present at global, national and above all local level. Tuning at all these levels can lead to good results in protecting the most vulnerable people.

Further information

All information from this guide is available at www.climatecentre.org, including updates and links to relevant documents and sources of information, checklists, templates and best-practice examples.

The main source of general information on disaster management for the Red Cross and Red Crescent is the International Federation's Disaster Management Information System at www.ifrc.org/dmis, to which all Red Cross/Red Crescent staff have access. This system contains information on monitoring, preparedness, and response, as well as a toolbox with detailed guidance and information on policies and procedures.

More general operational information, including appeals, information bulletins, operations updates and websites, can be found at www.ifrc.org

Good examples of early warning projects can be found at: www.unisdr-earlywarning.org/ewpp

Store employees install shutters for Hurricane Jeanne in Florida, USA. Photo: Reuters/Marc Serota





Red Cross/Red Crescent Climate Guide
Community risk reduction



Community risk reduction

The figures speak for themselves. Over the past decade, an average of 250 million people a year have been affected by natural disasters, and those are the ones we know about. Most disasters go unnoticed, or at least they go uninvestigated.

What may be catastrophic to one or two villages in less well-known parts of the world is often overlooked when annual Asian floods, or the hurricane seasons, bring suffering to millions of people. But all disasters are serious and most are increasing, in number and intensity, the smaller ones more rapidly than the bigger events.

Globally over the decade from 1996 to 2005, the number of people reportedly affected by disasters was one third more than in the previous ten years, the Centre for Research on the Epidemiology of Disasters in Belgium tells us. For the first time in 30 years the number of people killed by disasters did not go down anymore. On the contrary, deaths from disasters were up 84 per cent on the previous decade. They tripled in Oceania and more than doubled in the Americas.

South Asia showed the trend again in 2007, so did China. Afghanistan, Bangladesh, India and Pakistan suffered massive monsoon rains, heavy flooding, tornadoes and landslides. Vast areas were devastated. West and East Africa were hit by equally devastating floods only a few weeks later. An early onset of China's flood season overwhelmed southern parts of the country and, in the east, hundreds of thousands of villagers fled the worst flood on a major river in more than 50 years.

In the low-lying, flood-prone northern plains of Bangladesh, rural people awaited the onslaught. Among them were Red Crescent volunteers like Amirul Islam who understand conditions may get worse before they start to get better. They know threats from extreme weather are growing and that because of climate change bigger floods may well occur and more often.

The options are limited. People can run. They can wait in despair for the worst to happen. Or they can reduce the impact of the inevitable inundation.

Amirul and his friends have been showing local people they *can* do something. Close to the village of Sirahkunj the volunteers have planted some 300 trees – the start of a nursery – and, when big enough, they will be transplanted along river banks and roadsides to help check the force of the flooding. A modest move, perhaps, but in community terms it is hugely significant.

As Amirul explained to villagers, the trees will help improve their environment and help the community not only to survive but also to develop.

For a start their root spread will stabilize the earth in which they are planted and help prevent the erosion of precious topsoil that is so important for agriculture. They will provide sustainable income as well for, when mature, the trees will be felled and replaced by fresh saplings. The wood will be sold on local markets with the money going to the community.

That is to say nothing of forestry's role in balancing the effects of greenhouse gases. But most important

After the August 2007 floods International Federation watsan officer Niaz Muhammed inspects work on a well in Koshkalat, Pakistan. Photo: Mubashir Fida/International Federation of Red Cross and Red Crescent Societies



of all, the village will be less open to disaster. It will be more resilient, bounce back more rapidly, cope better with adversity. And it isn't alone. Across the country, disaster risk reduction programmes from the Bangladesh Red Crescent are benefiting villages after village.

They vary according to community needs, and include practical measures, such as raising the height of wells to prevent the floods from swamping them and cutting people's access to safe drinking water. With them all comes a message: no matter where you are and how huge the hazards there is always a way to diminish their menace.

Containing menaces old and new

Reducing the risks that natural hazards bring is a Red Cross/Red Crescent priority around the world, and something National Societies are uniquely placed to pursue because of their wide spread presence at the community level.

It is why, over the five years from 2006 to 2010, the Red Cross/Red Crescent Global Agenda is intent on reducing the number of deaths, injuries and illnesses from disasters, diseases and public-health emergencies along with their wider impact. It is why, at the same time, it wants to increase local community, civil society and Red Cross and Red Crescent ability to deal with extreme vulnerability.

What humanitarians call *community-based disaster reduction* (or, in the acronym-plagued parlance of disaster people, CBDR), is not exclusively about climate change, of course. Whether the measures taken are to decrease the consequences of hydro-meteorological disasters (avalanches, landslides, droughts, famines, extreme temperatures, floods, fires, storms, wave surges) or geophysical ones (earthquakes, tsunamis and volcanic eruptions) is immaterial. Good CBDR helps reduce the risks posed by climate change. Steps taken to contain an older menace can help contain new or increasing ones for which extreme weather or warming is responsible.

It was not climate change that caused the Viet Nam Red Cross to start planting mangrove trees along the seashore in 1994. Extensive deforestation had robbed large coastal tracts of the mangrove they once had and exposed coastal inhabitants to the ravages of typhoons and storms. But as sea temperatures and levels rise more severe meteorological hazards can be expected and the natural defences restored by crucial community effort are more important than ever.

If the National Society wasn't focused on climate change in 1994, it is today. The risks it brings could be disastrous still and while the mangrove programme continues much more is underway. Back in 2003, the Viet Nam Red Cross began a pilot project to integrate climate change into its existing disaster-preparedness programmes, joining forces with the Netherlands Red Cross and Red Cross/Red Crescent Climate Centre in The Hague to start what senior officer Nguyen Hung Thang describes as learning by doing.

"It isn't," he says, "that climate change alters the nature of our risk-reduction activities but it does raise matters of priority, particularly at the community level."

The effects of climate change on this country of 85 million people may be disastrous. In the past few years Viet Nam has seen typhoons move faster, grow in intensity and make landfall to the south where they were never felt with such strength. Coastal floods may already be reflecting sea-level rise and there have been more flash floods in mountain areas. Drought is worse in south central areas. All of these events could well be signs of more to come.

Viet Nam is one of the most typhoon-lashed nations in Asia. Every year an average of four typhoons and many more storms wreak havoc on it but it is also very vulnerable to sea-level rise, which, over the past 30 years, has been about five centimetres. Low-lying areas like the Mekong and Red River deltas are densely populated and it is estimated millions of people would be displaced by the sea-level rise projected for the end of the century.



"It isn't that climate change alters the nature of our risk-reduction activities but it does raise matters of priority"

NGUYEN HUNG THANG, VIET NAM

Nguyen Hung Thang says the greatest challenge is to gain community understanding of why the Red Cross is working on climate change, how it links to disaster and has a negative effect on their lives. Raising awareness about drought – a problem in many provinces – and how to reduce its consequences has posed particular challenges. "People tend to ask for things beyond our capability, like building a water factory."

The Vulnerability and Capacity Assessment (VCA) – a method developed by the International Federation for communities themselves to weigh up the hazards they face and the capacity they have to deal with them – helped the Red Cross through, he says.

The process is an empowering one. With Red Cross/Red Crescent guidance, villagers sit down and map the dangers they face, analyse why they are vulnerable to such hazards, and then develop concrete steps for an action plan.

Pham The Phu knows all about VCAs. She's a farmer in Quang Binh province where extremes are the name of the game – from heavy rains to extreme

droughts. In her Quang Phu commune they built a small makeshift dam to protect their rice fields but floods repeatedly destroyed it and reconstruction was an annual event.

When the Viet Nam Red Cross persuaded them to conduct a VCA the dam emerged as the thing the commune needed most. Almost everyone there is a farmer and water – not too much or too little – is what they depend upon. Red Cross funding was provided for a properly constructed one and the commune quickly saw the benefits. "The dam has not collapsed so the fields have not been flooded," Pham The Phu reported. "We can have two crops a year instead of one and the amount we harvested last time was 30 per cent higher than usual."

And when the rains did not come, there was still water enough for irrigation. Behind the dam was a simple reservoir.

It made much more sense than a water factory. But as the Red Cross's Nguyen Hung Thang points out when disasters happen people are prepared to discuss things. Getting them to prepare for possible hurricanes in a community that has never seen one remains a greater challenge.

Watch your language

Diane Turnquest, Disaster Management Officer of the Bahamas Red Cross, understands that challenge. Her advice: watch your language, honey.

She never starts talking of climate change when she approaches a community, let alone uses a term as exciting as vulnerability and capacity assessment. You put people off, she says.

"Where are the big fish?" she asks of fishermen whose catches are getting smaller.

"Way out in the ocean these days."

"Oh, why is that?"



“They think differently now. It empowered the community”

DIANE TURNQUEST, BAHAMAS

The conversation turns to the bleaching of the coral, a deadly process threatening the Caribbean and the Pacific. Coral reefs are very sensitive to increased water temperature. As the oceans warm, the corals, and their delicate ecosystems, are dying and the reef fish and marine animals living, breeding and feeding there are disappearing. The destruction affects tourism as well.

“It’s a conversation you can have with any fisherman,” Turnquest says. “Know your culture, know the people, know the language to use, know how to introduce what you want to do by adapting it to local circumstance.”

A guiding principle to climate change and VCA is always keep it simple. Keep in mind what the community can understand in terms of their own context.

Bahamians, Turnquest says, are indifferent to depressing conversation, averse to such thoughts as beautiful islands slowly sinking. Getting stronger is more the kind of language they appreciate.

West End, a storm-blasted community on Grand Bahama Island, is a case in point. After three successive hurricanes had ravaged it, a luxurious new tourism development that had arisen nearby donated an ambulance and a fire truck to the community. For the Bahamas Red Cross, busy so far with emergency relief, it seemed an opportune moment for some self-assessment.

“What will you do with those vehicles?” they asked.

West End wasn’t sure. The ambulance was bare – it hadn’t come with equipment – and West End had no firemen. The community sat down to discuss the options and a VCA got started.

Other issues arose. Someone said, “It’s all a waste of time. You’ll never *find* a fire or an accident.”

“Why?” asked the Red Cross.

“Our streets have no names. We have no addresses.”

Turnquest suggested, “Maybe we’d better go get some.”

A few days later, dressed in their finest clothes West Enders accompanied her to the city of Freeport, 65 kilometres away, to see the Director of Public Works. The community was moving. Soon it would be mobilized.

They got their street names, got excited, got firemen to train a volunteer brigade. They developed an evacuation plan, mapped the locations of the old, the frail and the handicapped, ensured care for the needy in emergencies.

Diane Turnquest says: “You had a community that had come to accept the hurricanes. They thought: they’ll hit us again, that’s life, there’s nothing anyone can do about it. They think differently now and what they have done they have done themselves, which is what the VCA was about. It empowered the community, and put value on their abilities. They are doing their own thing now. They don’t need outsiders.”

The Nicaraguan Red Cross has seen similar developments along their Atlantic coast after introducing one of the first climate change pilot programmes. Severe storms have hit the country frequently over the past decade and the National Society is helping communities face up to the threat of increasingly severe hurricane seasons and extreme weather.

VCAs have led to self-organization, and people knowing what to do when floods, bush fires and other catastrophes occur in their villages.

Elsewhere, the Samoa Red Cross is using VCAs to help vulnerable groups they have identified in the capital, Apia. Due to their social conditions, poverty and poor health they are particularly at risk from climate change effects. A drift of rural people to urban areas is ongoing and from its work in the social margins the National Society is convinced domestic migration exacerbated by climate change will challenge time-honoured systems and thinking and disrupt support structures.

And in Mozambique – hit every year by at least one cyclone and strong tropical storms that contribute to increasingly common and severe flooding – the Red Cross emphasizes respect for local tradition as it involves community members in data collection, risk mapping and planning.

Globally, risk and vulnerability to natural disaster is increasing but from within the community there is always a chance to turn the tide.

Community risk reduction

How-to guide

All around the world, the Red Cross and Red Crescent stands ready to respond, and to advocate for speedy recovery and reconstruction. But disaster response, recovery and reconstruction are not enough. Besides better early-warning systems and preparedness to respond, we are trying to reduce the risk of disasters, by making people aware of the hazards they face and helping them to reduce their own vulnerability. Climate change has made such efforts more urgent.

The Red Cross and Red Crescent can build on a key asset: its network and a grassroots community presence. It is at community level that disasters affect people's lives and livelihoods. But it is also there that many simple things can be done to reduce their impact. Community Risk Reduction, or in full Community-based disaster reduction (CBDR) has become an important part of the disaster-management activities of many national Red Cross /Red Crescent societies.

Helping communities to reduce their vulnerability does not mean telling them what to do, or installing some protective infrastructure. It is about facilitating a dialogue about local concerns, and helping people to define their own priorities for risk reduction.

A good instrument for such dialogue is the Vulnerability and Capacity Assessment (VCA), a set of tools developed by the International Federation to help communities assess and address the risks they are facing.

This section is aimed at National Society staff and volunteers working on disaster management and risk reduction at the community level, and discusses how they can integrate climate change into their work.

The approach: keeping it simple

Good CBDR helps reduce the risks of climate change, even when climate is not explicitly addressed. Many measures to reduce other dangers also help lessen new or growing threats brought on by climate itself.

CBDR, however, can be even more effective by directly addressing climate change. First, the threats involved are added motivation for a community to act. Second, some risk-reduction measures and strategies may need to adjust to new or increasing risks.

Incorporating climate change into VCAs to plan disaster reduction may seem complicated: introducing tricky scientific information and a host of additional considerations.

However, a key guiding principle should be to KEEP IT SIMPLE:

- Keep in mind that people are likely to have already noticed changes in weather patterns.
- Keep in mind what the community can grasp in terms of their local context.
- Keep in mind what the facilitators doing the VCAs can absorb and communicate.

Local people are the experts on their own risks. All you may need to do is ask what they have observed regarding unusual weather events, briefly explain why the climate is changing globally, and help them decide on how to respond locally.

Keeping it simple is even more important because a key challenge with CBDR is to reach a large number of communities. It is nice to spend time and energy on helping a few really well, but the challenge is to scale up, provide assistance to *all* your country's vulnerable people. You cannot do that if weeks and weeks are spent preparing each VCA or several highly qualified headquarters staff are required to conduct the discussions. To have a wide impact the approach *must* be simple enough to be applied by our local volunteers.

People gather to get water from a huge well in the village of Natwarghad, India. Photo: Reuters/Amit Dave



Step by step: integrating climate change into CBDR and VCAs

Step 1:

Collecting general background information.

Step 2:

Assessing priorities.

These two steps are typically undertaken as part of a broader assessment of the changing risks a country faces (see *Getting Started: How-to guide, step 3*) and priorities within the overall disaster-management activities of a National Society (see *Disaster management: How-to guide, steps 1 and 2*).

The prioritization should consider the selection of areas/communities to be targeted for CBDR and VCAs, guided (among other things) by the way climate change is affecting particular parts of the country.

Step 3:

Conducting VCAs

Integrating climate change into VCAs can be done in a very simple way. The main purpose of the VCA is to discuss the risks a community faces so they can identify *their* priorities for risk reduction.

This does not depend on complicated scientific information, although sometimes it can be discussed to confront a community with what they may

face in the future. But explaining that information and making it relevant can be a challenge.

So the team preparing the VCA should decide beforehand how basic or complex the integration of climate change should be. Below are three options to choose from.

By default: *keep it simple (Option A)*. More detailed discussions on climate change should only be included when the National Society has clear and relevant information about how risks are changing at the local level, and skilled facilitators are available to discuss this comfortably with the communities.

OPTION A (BASIC): Getting additional information from the community, by asking the right questions

Make sure that the VCA asks the right questions to get information about unusual climate phenomena and trends that the community is experiencing, or has seen happening over the past decades. This requires attention to a number of VCA tools that examine trends, particularly:

- *Seasonal calendar*: ask whether seasons have been changing, for instance if the rainy season is starting particularly early or late, or if weather that used to occur in one season is now occurring in another.
- *Historical calendar*: ask about systematic changes in temperature, rainfall and other weather events; as well as occurrences of “strange” weather phenomena.

- *Risk map (or transect walk)*: ask people to describe not only the current situation in a particular place but also how it has been changing.
- *Questionnaires and focus group discussions*: add special questions such as, “Have you noticed unusual weather patterns?” and “How did that weather affect you, your family and your community?”

Preparations

You do not need to include any new scientific climate information in the VCA process: it is enough to clearly communicate, after eliciting observed changes from participants, that people all over the world are reporting similar changes, and that scientists tell us that things are likely to get worse in the coming decades. During preparations, all that needs to be done differently is to include questions such as the ones above in the VCA materials (checklists, tools, etc.).

VCA training

The training needs to pay attention to the additional questions to be asked, and how to use the answers to improve dialogue with communities. For awareness raising, it might be good to inform them about global climate change, but it should be stressed that there is no expectation that they discuss these issues during the VCA.

Conducting the VCA

Include the suggestions listed above.

Analysing the results

After the VCA, the team should analyse the community’s information, particularly documenting the way they have described new risks or trends in weather patterns.

If possible, you should cross-compare those community observations with the scientific information from your society’s national climate-risk assessment. Assess whether risk reduction strategies identified in the VCA are robust in the face of climate change trends suggested by scientific reports.

OPTION B (INTERMEDIATE): Provide climate information as a backgrounder for VCA facilitators

Option B is similar to Option A, but with the additional element that facilitators are briefed on climate change so they are aware of the context when they conduct the VCA. The intention is simply to provide them with background information, *not* that facilitators should “explain” climate change, and the changing risks, to the communities.

This places more demands on training and development of communication materials (such as posters or video tools). There is a risk of misleading communities if volunteers wrongly interpret scientific information or erroneously guide the VCA’s outcomes in a particular direction. However, it can help the facilitators to have a more meaningful dialogue with the communities, and to better

assist them in discussing options to reduce their risks.

When preparing and conducting the VCA, just follow the steps of Option A. In addition, the *training* should include a presentation on climate change and its implications in the local context. The information is generally based on the national risk assessment done at national society headquarters, and adapted to the circumstances of the communities where the VCA will take place.

During *preparations*, try to tailor relevant climate change information (for instance, from the national risk assessment) to the specific situation of the VCA. Keep in mind that the general climate information needs to be examined from the local perspective: what might the changes mean for the location/community? This should be done in general terms, written down on one page, in simple language, such as: “The rainfall may come in heavier bursts, and there may be longer periods without rain”, “Storms may be stronger than before”, “The rainy season may start later”.

You may need to ask for help from a climate expert, but make sure that the analysis stays relevant to Red Cross/Red Crescent needs. “Increasing risk of flood” is better than “six out of seven of the best climate models agree that there is at least a 70 per cent probability that the return period

of extreme precipitation (above the 90th percentile in the current distribution) will decrease by at least 10 per cent”. Force climate experts to explain what they mean, and to translate it into language that facilitators and communities will understand.

OPTION C (ADVANCED): Helping communities to plan for the future by bringing in outside information on climate change

In this option, VCA facilitators are explicitly instructed to discuss climate change with the community. It requires much more expertise and experience, and should only be chosen if you are confident you have the information, training capacity, support materials and experienced volunteers who will be comfortable doing it.

The process is similar to Option B, but during the *training* you should not only convey key information about climate change to the facilitators but also enable them to really understand it and explain it to communities. This is not easy! Most importantly, the training must also provide guidance on how to *carefully* introduce changing risks into the VCA discussions.

Without proper guidance, communities may be tempted to start labeling every weather-related problem they have faced as “climate change”. This is unhelpful. All we want to accomplish is to increase their understanding of their circumstances, and explain

that some unusual patterns and events are not necessarily unique results of supernatural forces: they are likely to be part of a global trend that will go on occurring. And more importantly, to help the community to consider what *they* can do about the new risks they face.

This dialogue requires learning-by-doing, including simulations or other exercises that force the facilitators to practice.

Step 4: Implementing CBDR

To some extent, the VCA may already have resulted in enhanced awareness and disaster risk reduction by the communities themselves. To some extent, it may also help plan further Red Cross/Red Crescent material assistance (such as the construction of shelters, communications equipment, seedlings for reforestation to prevent flooding, and water-catchment systems) or improved community processes (such as plans for disaster management, or diversification of the local economy to reduce vulnerability to droughts). In some cases, follow-up may involve partnership with NGOs and local government, and advocacy regarding local and national policies, for instance on safe shelters, building codes or joint risk-awareness programmes. Such things are no different to regular CBDR activities – except that when climate change has been taken into account, activities are planned with the changing risks in mind.

Step 5:

Evaluation

Given that risks are continuously changing, it is important to regularly evaluate the National Society's CBDR programmes. *Evaluation should be a continuous process.* Have climate-related programmes been targeted at the right areas? Are they reaching a sufficient number of vulnerable people? And, particularly if new threats or diseases have occurred, is there a need to update the priorities?

In this evaluation, there is a special role for the information from the VCAs. Local communities may report changing risks that may not yet have been picked up by the National Society at headquarters level or by the relevant government institutions.

In addition, it is important to return regularly to communities where a VCA has taken place to check on follow-up and maintain a continuous dialogue on the risks they face and the way these can be reduced.

It is important to document information from VCAs, as well as the experiences (positive and negative) from actual CBDR programmes. The more such examples are shared and the successful ones replicated, the faster we will be able to expand our coverage, dealing effectively with changing risks.

Checklist

- Are you addressing the new risks in your CBDR programmes?

- Have you kept it simple?
- Does the scope of the VCA fit the capacities of the staff and volunteers involved?
- Does the plan of action that results from the VCA respond to the trends in risk that were identified?
- Have you thought about how to evaluate and scale up the outcomes, reaching not just a few communities but many?

Pitfalls

Climate change may seem daunting and complicated, and many National Societies may feel uncomfortable discussing it with communities. Volunteers doing the VCAs may find the scientific information confusing and, in turn, risk confusing the communities, rather than helping them.

If this is the feeling you have, take a step back and simplify. The science of climate change does not need to be discussed with the community. You don't need to enter into a dialogue about weather statistics. All you need to discuss is the fact that risks may be changing. Just asking questions about changes and trends in the weather may be enough to raise people's awareness, and trigger them to thinking about reducing their vulnerability.

Planning for climate change is not new and complicated. It should remain rooted in your local priorities and understanding.

Don't be overwhelmed, just get started and keep it simple.

Opportunities

Climate change provides a strong incentive for more and better CBDR, because it helps communities not only to identify the changing risks they are facing, but also to realize their growing importance and identify ways to reduce them. It can strengthen the Red Cross/Red Crescent relationship with communities because the National Society can really help.

Further information

All information from this guide is available on www.climatecentre.org, including updates and links to relevant documents and sources of information, checklists, templates and best practice examples.

The main source of general information on CBDR and VCAs is the International Federation's website: www.ifrc.org.

Further general information on community risk assessments (CRAs) from other organizations is available from the ProVention Consortium's CRA toolkit on www.proventionconsortium.org

A woman stands outside her house damaged by Hurricane Dean in the town of Tecolutla, Mexico. Photo: Reuters/Tomas Bravo



“CHURCH BELLS SOUNDING THE ALARM ON THE MOSQUITO COAST”

Case Study: **Nicaragua**

In September 2007 Hurricane Felix presented the Red Cross climate change projects in Nicaragua with both vindication and their greatest challenge.

Vindication because the projects, throughout their four-year history, have been tightly focused on preparing people for the unexpected; and about one aspect of the hurricane all Nicaraguans were in agreement: it was a total shock.

A new challenge because, although disaster preparedness workshops held up and down the Mosquito Coast undoubtedly saved lives (as is evidenced below), the effort of the Red Cross and others to prepare Nicaraguan society for the impacts of climate change did not include a group more vulnerable even than the long-neglected villages of the Atlantic coast: the seasonal lobster fishermen of

the Cayos Miskitos (the Miskito Keys) and their families, who were decimated by the hurricane as it swept across them early Tuesday morning, 4 September.

Simón McDavis Pablo, a Miskito captain who has spent 30 of his 44 years at sea and may emerge as the greatest unsung hero of Hurricane Felix in Nicaragua, bitterly regrets not being able to save more lives than he did. Anchored in the Maras Keys, just over 40 nautical miles from the mainland, McDavis was hoping to be able to ride out the storm with the 170 people – lobster catchers and their families – who had crammed onto his boat, the *Mrs Julies*, for shelter as the weather deteriorated on Monday evening.

Warned not of a hurricane but only “very strong winds”, he insisted to *El Nuevo Diario* a week later, he realized he would have to weigh anchor and take his chances in open water: Felix was tearing up anything solid and turning trees into airborne battering rams. A five-hour struggle for survival followed that

astonishingly brave decision. “We thought, ‘We’re all going to die here’,” he recalled. “At about three in the morning the wind got stronger still, picking up the boat and rocking it to and fro. As one side fell, I yelled at people to move to the other as ballast.”

“At five I thought we probably had an hour to go. The wind felt like mortar fire, like a landslide, but I told them, ‘We’ve beaten it. Hang on’.”

When the worst of the storm passed, Simón initially thought they’d been carried somewhere else. “Everything had disappeared,” he said. “But then I recognized a wooden beam and we saw it all: bodies floating in the sea, injured people, a community that no longer existed.”

Bitter recrimination followed the disaster in the keys. Some Miskitos accused the government of doing too little to warn people, too little to evacuate them and too little to search for survivors and, ultimately, bodies.

But it seemed harsh to blame the Nicaraguan navy for the disaster: even a first-world navy equipped with enough fast, light patrol craft would have been hard pressed to find and evacuate all the divers and fishermen scattered among the keys in their small boats and *pangas*, in darkness.

The tragedy of the keys was that the lobster and hurricane seasons overlap: some reports said the lobster boats had refused to heed warnings; or that boatmen had been unable to turn for the mainland because divers were submerged.

A Nicaraguan officer leading the last search for bodies a week after Felix said only that the navy had evacuated “a large number of people” on Monday but that “others” had opted to stay put to look after their equipment. He added that many fishermen had been widely dispersed and out of radio contact.

More than a week after Felix, Miskito people were still congregating at the harbour of Puerto Cabezas – the capital of the Región Autónoma del Atlántico Norte, known as “the RAAN” in Nicaragua. They hoped

against hope their relatives might emerge from the keys alive; or that there might be some confirmation of their fate, or perhaps just a body.

Krukira – a miracle?

The National Hurricane Center (NHC) in Miami placed the eye of Hurricane Felix “about 15 kilometres north-north-east of Puerto Cabezas”, and that, to the kilometre, is where Krukira lies. The Miskito village of some 2,500 souls took the full force of Hurricane Felix’s Category-5 winds – at least 250 kilometres an hour – after it scythed through the Mosquito Keys. Krukira is also one of the places where Red Cross disaster-preparedness workshops have been held as part of the climate change project.

Category-5s fit the popular stereotype of what a “hurricane” is – a massively strong *wind* – better than, for example, Hurricane Mitch in 1998, which made landfall only as a Category-1 but wrought destruction through the flash floods it caused in, above all, Honduras and Nicaragua.

One chilling fact, at the time of writing, makes the 2007 hurricane season exceptional: after Hurricane Dean, Felix was the second Category-5 storm in the region in less than a month, and the NHC said it was the first time two Category-5s had made landfall *in a single season* since record-keeping began in 1886.

Visiting Krukira a few days after Felix, it seemed nothing short of miraculous no one died there and only five people were injured. The village looks as if it has been carpet bombed: its few concrete structures – including a church and a school – lost their roofs and their windows. The villagers’ houses, many of them “*tambos*” on stilts, were either blown to tinder or demolished down to floor level (but, importantly, often not right down to ground level). Trees have been splintered or completely felled. The ground is soaked from rain but there was no flood.

“We’d been listening to the news about the hurricane since ten that morning, and by seven in the evening

it was getting serious,” recalls Junior Wislaw Radis, a teacher at Krukira’s school, now a roofless shell.

“The regional government was broadcasting advice about what to do if the storm reached hurricane strength. “At one in the morning, Puerto Cabezas sent us two buses to evacuate people who wanted to go to town. About 500 people went and 2,000 of us stayed here.

“No one was actually leading – it was really just the news that suggested what we needed to do. But emergency-committee members were warning people who didn’t have radios, and by seven people were taking shelter in the church and the school.

“There are lots of over-sixties in this village and none of them has ever seen anything like this before.”

“Panic, terror”

Besides hearing from the radio, people in Krukira and other Miskito villages realized the situation was serious when the church bells were rung – the time-honoured way of sounding the alarm on the Mosquito Coast.

Krukira’s relatively imposing Moravian church is certainly the most obvious place to take shelter, but even that didn’t feel entirely safe, according to Pastor Romero Rivera Bayardo. “There were about 200 people here in the church and about a hundred in the parsonage,” he says. “Mostly women, children and the elderly.

“If the peak winds had lasted another hour or so, I really think people would have died of fright. They couldn’t have taken any more. The very walls were shaking. People were lying on the ground. There was panic, terror, and – after the rains came down – cold. Now they need psychological assistance to recover their spirits.

With 500 people evacuated by bus, some 300 sheltering in church buildings and possibly a similar

number in the school and elsewhere, a majority of Krukira’s people sat the hurricane out in (or under) their homes, doing whatever seemed sensible in the circumstances. In the absence of flood, the chief dangers were collapsing structures and flying debris.

“I didn’t come to the church or the school but stayed in my house with my family,” says Junior Wislaw Radis. “When it started to collapse we stayed under the *tambo* with several other families. There were five children in there, all under six – but thank God none of them was injured.”

Both men agree the Red Cross workshops were valuable: the disaster-preparedness sessions, focused on the consequences of extreme weather, will have planted a seed that grew into a glimmer of recognition when Felix began its run in and the wind became seismic. The workshops will have given people a bit more time to think; a little less cause to panic.

“They helped us prepare for an uncertain future, helped us to be willing to take refuge and save ourselves,” says Wislaw.

People evidently did not just panic; young men, for example, went round gathering up elderly people and shepherding them to the church. “The training organised here by the Red Cross helped a lot,” adds Pastor Rivera. “It gave us direction, information, strategies about how to act in a natural disaster – before and after.”

But the lesson of Felix, on this part of the coast at least, seems to be not only that people won’t evacuate – they will if adequately – but that evacuation in very high winds is meaningful only to the extent that transport is available.

Only one bus

Puerto Cabezas had its own problems that night, as Guillermo Fox, a disaster-prevention official with the town council recalls: “The people honestly weren’t quite sure what was happening. This is the first time

in living memory we’ve been through anything like this. But now, after Felix, they’ve learnt a lot.”

With a total population of some 50,000 potentially needing to be moved to shelters “we faced limitations”, says Fox. “We didn’t have sufficient resources to evacuate everybody so some people arranged their own evacuation.

“I would say about 70 per cent evacuated and 30 per cent stayed put. But there just aren’t sufficient shelters for everyone in the built-up area.”

Another bus made it to Krukira’s neighbouring village, Twapy, which now also looks as if it has been systematically demolished with explosive charges, but is nevertheless just recognizable as a once-idyllic Miskito settlement. The bus made two runs to Puerto Cabezas.

Erlinda Urvina, president of Twapy’s emergency committee, relates essentially the same sequence of events: increasingly worrying radio news stories; people crowding into the concrete communal dining hall; some getting away by bus; then, for the rest, a night of almost paralyzing terror as the hurricane tore through.

“Just before eleven we started ringing the church bell,” she says, “and people came quickly, with their children and their old folk. We said the very young and the very old should be evacuated first, and everyone accepted that.”

Urvina is unsure how many people managed to shelter in the dining hall. On the Miskito Coast, populations are usually enumerated in terms of families rather than individuals. There are 145 families in Twapy.

“I couldn’t count, given everything that was happening, but it couldn’t take everyone and some people had to stay in their homes. I reckon there were about 300 people in there. It was full, completely full.”

Despite Miskito tradition, people in Twapy did not take refuge in the church, fearing its roof and perhaps its steeple would fall in on them, highlighting a

now-urgent need on the Mosquito Coast for buildings to be properly surveyed to determine which should be used as hurricane shelters. Or what people should do if they cannot get into shelters.

Had one of the concrete buildings in either Twapy or Krukira collapsed there would probably have been scores of deaths. Where adequate shelters cannot be built, research should be carried out to compare the safety of concrete structures and traditional *tambos* for people to face the threats of strong winds and floods.

Radio alert

On one other aspect of the Hurricane Felix story there is widespread agreement: the main means by which news of the storm’s approach was disseminated was on ordinary FM radio.

One such station is Radio Caribe, a partner in the HIER climate-change project with the Dutch organization Freevoice. Director Kenny Lisby Johnson explained that the first forecasts saying Hurricane Felix would hit their part of the coast emerged on Saturday and were broadcast straight away. The red alert came around midnight on Monday.

“After the emergency committee was activated on Monday morning, the authorities started passing by to give official warnings and alerts,” he says. “We were on the air until the hurricane made landfall and hit our antenna, which was almost completely destroyed.”

Lisby believes the warnings paid off: “Many people were evacuated in time or had the common sense to evacuate under their own steam. The training people have received on what to do in disasters has helped.”

Other radio stations, like La Voz Evangélica de la Costa Atlántica, were in direct touch with the NHC in Miami. “Our antenna fell some time between four and five in the morning,” says director Salvador Sarmiento Alvarado. “But the roof is mostly intact.”

Francisco Osejo, a Red Cross volunteer and a technical assistant on the climate project based in Puerto Cabezas, spent much of the week immediately after Felix helping to ferry casualties from the airport and seaport to medical facilities in the town. In terms of community response, he saw one clear improvement over Hurricane Beta two years ago: the neighbourhood committees where the project has been working asked for proper data sheets they could use to provide information on damage and losses.

According to Osejo: “It’s very important that people know what climate change is and what they can do to meet the threat. It affects everyone at different levels,” he says.

“Despite the extensive damage, the human casualties have been minimal in the areas where we’re working.”

The hurricane signal

All unprecedented disasters expose new areas of vulnerability.

What Hurricane Felix seems to have established in Nicaragua is that it is not enough just to prepare for storm surges and floods. Strategies have to be developed for coping with catastrophically high winds (the Netherlands-financed shelter in Betania collapsed because it was built on stilts, on high ground, with floods in mind) and for situations where evacuation is not possible.

In many Miskito villages in the RAAN, people stayed in or under their homes because there was nothing to evacuate in and nowhere to evacuate to – or the buildings thought safe were full.

Mauricio Rosales, director general of meteorology at the Instituto Nicaragüense de Estudios Territoriales (Ineter), says there’s been “an increase in the number of seasonal Caribbean hurricanes” – citing the record-breaking 2005 season – “but we’re

also getting more Category-4 and -5 storms in the region”. This as opposed to Hurricane Stan, for example, a relatively weak Category-1 that was actually embedded in a system of rainstorms that deluged the Central American isthmus in 2005 causing flooding and mudslides and up to 2,000 deaths.

Just before Hurricane Felix bore down on the Atlantic coast earlier this year, Ramon Ernesto Sosa, head of Nicaragua’s main disaster-prevention agency, told reporters in Managua that some 50,000 people were particularly at risk because, of necessity, they lived “beside rivers or on hillsides or small islands”. But he cannot have been sure whether the greatest danger was from wind or flood or both.

Up In Smoke, Latin America and the Caribbean, the third (2006) report from the working group on climate change and development in the United Kingdom, points out that Central American governments are less centralized than Cuba’s – often regarded as a model of compulsory evacuation in the face of hurricane threats – and “the risks faced are more varied and widespread, the populations larger and more dispersed. Corruption is also a problem.”

“There can be a lack of political will in national governments for reducing risks to the poorest,” the report adds. But (and the evidence of the Red Cross climate change programme surely bears this out in the case of Nicaragua) “willingness to improve preparedness often exists, particularly at local level”.

Drought

Asked bluntly what he thinks the evidence for climate change in Nicaragua is, Mauricio Rosales’s answer is shifting agricultural seasons. “The main thing,” he explains, “is that in all parts of the country where they sow crops, the sowing season has changed.

“The air temperature is rising, and the difference between the minimum temperature and the maximum temperature is narrowing.”

Francisco Osejo also draws attention to the drought areas. “It’s affecting the north especially,” he says, “the area around the town of Ocotol, Estelí, Nueva Segovia, parts of Chinandega and León. In the last few years the drought has got worse and people have lost a lot of crops and that’s giving rise to nutritional problems too.”

A new Netherlands Red Cross-backed programme is getting underway in the north-east now.

Scientists at Ineter believe the most significant fall in annual precipitation might come in the already dry north-west. Rainfall in the central and southern Pacific region could fall from a maximum of 1,800mm per year to just 1,000mm – significantly increasing the total drought-affected area.

But the best data Ineter has shows the climate in parts of Nicaragua, at least, was already drying out, so climate change can only exacerbate this.

The bad news for the Miskito people is that the “dry” area actually snakes east, out from the broiling north-west to encompass many of their isolated and vulnerable settlements strung along the 800-kilometre River Coco that serves as the border with Honduras.

In May, journalist Annie Kelly of the *Guardian* reported from San Carlos – a river settlement deep in the Central American interior – that almost a month into the rainy season, when it would normally be “a swirling torrent”, the river was “ankle-deep and dugout boats struggle to negotiate their way upstream”.

In the village of Siksayari, home to 1,400 Miskito people, a volunteer technician from the Nicaraguan agriculture ministry said people had been without basic supplies like salt and drinking water for more than a month. “There are no roads,” he said.

“Nobody expected the river to dry up and now supply boats can’t get down here. At the moment the water is too polluted and diseases like cholera and tuberculosis are rising.”

Fatalism

The Atlantic region of Honduras and Nicaragua is remote and inaccessible, hundreds of miles from the two countries’ capitals, on inadequate and not entirely safe roads, through jungle and mountain areas. It has long been below the radar of central governments in Managua and Tegucigalpa.

Nicaragua was originally chosen to pioneer the Red Cross climate-change project because of its geographical position, its poverty, and above all because of the acute vulnerability of its fragile coastal and riverside populations.

This was in keeping with the very good Red Cross idea that if better disaster preparedness in response to climate-change impacts can be put in place there, then it can be done anywhere.

When Cony Silva Martinez, a psychologist by profession, began work as the Managua-based coordinator of the project, she knew the Nicaraguan Red Cross in the field would need to meet the challenge of what she calls the “religiously-based fatalism” of all rural Central Americans.

“But on the Atlantic coast at least,” Silva adds, “where the danger comes from hurricanes, people are beginning to see that the disasters they need to worry about aren’t entirely natural.”

Cony Silva began working with the Red Cross as a psychologist in the immediate aftermath of Hurricane Mitch, helping people rebuild their lives. She is acutely aware of the importance of the psychological element in awareness-raising – crucial to the climate-change programmes on the Atlantic coast.

Despite the tragedy of the Miskito Keys, where people who missed a certain deadline to evacuate probably sealed their fate, the provisional conclusion after Hurricane Felix must be that it has highlighted the Miskitos’ will to survive in their isolated territories.

“Our Nicaraguan colleagues are telling us we must try to reach younger people with disaster preparedness messages,” says Esther Barend, the Guatemala-based coordinator of the Netherlands Red Cross climate projects in Central America, who arrived in Managua the day before Felix struck.

But, after Felix, which messages? “The original vulnerability assessments we carried out suggested people were most afraid of floods,” says Barend. “But Felix was a Category-5 wind, and on the coast at least there weren’t many floods.”

The reality now is that there might actually be a conflict between flood preparedness and high-wind preparedness. “The last place you want to be in a Category-5 hurricane is on high ground in a raised building,” Barend adds. “Felix has thrown down a major challenge to this project, but it’s one we’re determined to meet.”

Damage by Hurricane Felix in Krukira, Nicaragua. Virtually everything built of wood collapsed. The few buildings left intact were concrete. Photo: Alex Wynter/International Federation of Red Cross and Red Crescent Societies





Red Cross/Red Crescent Climate Guide
Health and Care



Health and Care

Throughout human history climate and health have been inextricably linked. Certain kinds of climate – moderate ones, broadly speaking, warm but not too hot, with low humidity and fresh breezes – were seen as innately healthy. Weather extremes, by definition, are potentially injurious to health – if not life and limb.

The latest (2007) report from the Intergovernmental Panel on Climate Change (IPCC) says that “climate change currently contributes to the global burden of disease and premature deaths” (see *table below*). And it will continue to do so: increased malnutrition and consequent disorders, with implications for child growth and development, can be expected. There will be more deaths, disease and injury from heatwaves, floods, storms, fires and droughts.

Studies in temperate areas have shown that climate change is projected to bring some benefits, such as fewer deaths from cold exposure. But “overall”, the scientists add, “these benefits will be outweighed by the negative health effects of rising temperatures worldwide, especially in developing countries”.

There and elsewhere: “Those at greater risk include the urban poor, the elderly and children, traditional societies, subsistence farmers and coastal populations.”

Very few national Red Cross/Red Crescent societies will be untouched by the health implications of climate change. In particular health fields – malaria prevention, for example – National Societies may suddenly find themselves doing more, perhaps much more, of the same work in the same place; or possibly the same work in a completely new location.

Or they may face quite new challenges altogether – like “killer” heatwaves in northern Europe.

Hot and hotter still

When tens of thousands of people gathered early one morning in July 2006 in the Dutch city of Nijmegen for the annual competitive walk of up to 50 kilometres, they were already cursing the heat, which rose rapidly above 30 °C. By the end of the first of the planned four days, two walkers had died of heatstroke and hundreds more had been taken ill. It was a totally unprecedented turn of events.

The temperature in Nijmegen was forecast to rise to 36 °C and the organizers, facing a terrible dilemma, decided to cancel the rest of the event – the first time that weather shut the walk down since the start nearly a century ago.

According to Fleur Engel of the Netherlands Red Cross (NRC), heatwaves were then “not seen as a major risk, despite the severe European heatwave of 2003, which claimed up to 1,400 Dutch lives” and more than 33,000 in the rest of Europe, mainly elderly people. The far more familiar climate threat in the Netherlands, of course, a delta of three rivers, half of whose territory lies below sea level, is *flood*, not heat.

The Netherlands Red Cross and the Red Cross/Red Crescent Climate Centre in The Hague had in 2004 started an education programme on climate change

A Netherlands Red Cross volunteer providing water during a heatwave. The risk of such heatwaves is rising rapidly due to climate change. Photo: Netherlands Red Cross





“There is a need for psychological support for those who lose their property through floods”

ETHEL KAIMILA, MALAWI

for branches in which volunteers gave presentations linking climate change and work for vulnerable people at home and abroad. The NRC contacted the government and it was agreed that a national plan for both heatwaves and cold waves would be developed, says Engel, “but after a few meetings early in 2006 there was still little sense of urgency”. Later that year, after two heatwaves during the summer, things finally changed for good, and the national heatwave plan was written.

This plan is the result of good cooperation between different institutions and the NRC. It targets those people who are most vulnerable to extreme heat and describes the tasks and roles of different parties involved, such as health services, general practitioners, nursing homes and volunteer organizations. It includes a health warning system, guidelines for volunteers and a sticker with simple advice on what to do when temperatures rise.

Now as summer heatwaves build, the National Societies in France, the Netherlands and elsewhere are much better prepared than they were to send

volunteers to visit elderly people, sweltering alone in their apartments, or distribute bottled water to motorists stuck in traffic – like they did in Romania, for example, during the intense 2007 heatwave in south-east Europe.

In Europe, and especially northern Europe, where deadly heatwaves have been a rarity, it may get significantly worse. British scientists at the Meteorological Office’s Hadley Centre report that by the 2040s, the 2003 European heatwave (the hottest and deadliest ever) might seem normal.

But what of the poorer south, the “low-latitude” tropical countries where – most observers agree – climate change impacts will be far more damaging?

In sub-Saharan Africa there is something occurring that could be described as drought-flood-drought, and it is already claiming many thousands of lives.

Africa: drought-flood-drought

Ethel Kaimila, programme coordinator of the Malawi Red Cross, believes that life expectancy in her country has fallen to 39 partly because of the repeated droughts, which fit the pattern of climate change. “Now the boreholes are dry,” she says. “Skin conditions get out of control due to lack of water, scabies is on the increase.

“There is a need for psychological support for those who lose their property through floods: they do not understand why it is happening so frequently. Volunteers need to learn new communications skills.”

According to a January 2006 report by Tapiwa Gomo of the International Federation: “Many of the areas [of Malawi] hardest hit by floods have suffered droughts that have led to a hunger crisis.”

There are also fears of malaria, with receding floodwaters leaving behind stagnant pools where the mosquitoes that carry it – the disease “vector” – multiply rapidly.

The National Society in Malawi has focused its efforts on the provision of shelter by pre-positioning tents in flood-prone districts across the country. As the rainy season ends, households rebuild and the Red Cross tents can be stored for future use.

The rapid succession of drought followed by flood followed by drought again is creating new “complex” emergencies in Africa – almost permanent disaster conditions, according to Abdishakur Othowai, drought project manager at the Kenya Red Cross Society. Large numbers of people are being displaced and ending up in camps where the HIV rate soars.

“Our policy,” he says, “is to tell people that we have to adapt, because this phenomenon will be with us for a very long time.”

Robert Akankwasa, head of disaster management at the Ugandan Red Cross, points out that Ugandan weather records from the 1960s and 1970s are “totally different” to the present, yet people are not clear about whether this is a symptom of full-scale climate change or just a blip.

Either way, there is little debate about one lethal by-product of the worsening floods in the country: cholera. “Now we have increasing cases of cholera every rainy season,” says Akankwasa, “within mainly urban areas”. This is probably caused by a combination of climate change and unregulated construction intensifying dangerous rainwater “run-off”.

Ugandan Red Cross workers, however, are optimistic about the National Society’s ability to respond. After the 2007 cholera outbreak, in which about a third of cases proved fatal, the National Society trained over 250 volunteers in Bundibugyo and Hoima districts – two of the worst affected – in the causes and symptoms of cholera, disease management, hygiene and sanitation.

During a door-to-door public information campaign more than 5,000 households were contacted as well as six primary schools in Bundibugyo. In Hoima community leaders even enacted by-laws aimed

at improving domestic sanitation. With emergency funding from the International Federation, volunteers were able to use megaphones and play educational videos on market days and at religious and cultural meetings.

The message from Uganda: cholera can be beaten.

Rift Valley Fever and Tanzania’s silent disaster

Julius Kejo, who runs disaster preparedness for the Tanzanian Red Cross, remembers they were very lucky to have been hosting some guests from Kenya at about the time Rift Valley Fever (RVF) was first spotted in humans during the recent outbreak.

The Kenyans, much more familiar with RVF and its symptoms, realized that cattle urinating blood in a village they were visiting were suffering from the potentially fatal viral disease, which is also spread by infected mosquitoes and can be caught by humans. A little later the fears were confirmed when they heard of five confirmed cases in the same area.

“The communities were not getting the right information on how to prevent the spread of the disease,” Julius recalls, “so as Red Cross what we could do was prepare leaflets carrying proper information.”

But the disease did eventually spread to ten administrative regions of Tanzania, killing nearly half the more than 300 people infected, according to the authorities. The central region of Dodoma, where 85 people died, was the worst hit.

There is no fully proven link to the recent outbreak, but the mosquitoes that carry RVF are known to breed rapidly in flooded areas. And as Julius says, “some people we’ve met have lived in the same place since the 1960s and never experienced the kind of floods we’ve had lately”.

In the sober language of the International Federation’s emergency appeal: “Tanzania has been impacted



“Some people we’ve met have lived in the same place since the 1960s and never experienced the kind of floods we’ve had lately”

JULIUS KEJO, TANZANIA

by extreme climatic conditions since October 2006. Rains spread across the country with a growing intensity. Several lakes and rivers overflowed”.

Floods, of course, are not uncommon in Tanzania. But “a striking feature of this year’s disaster,” according to the appeal, was its “intensity, duration and scale”. Many said that its magnitude was unprecedented and its effects the worst in many years.

The people affected were left in appalling sanitary conditions, lacked access to safe water and suffered from the intense heat that encouraged the spread of disease. The Red Cross called the Tanzanian floods a “silent disaster”.

Tanzania’s RVF was also apparently the result of a change in the range of infectious-disease vectors. The mosquitoes that carry it found themselves with a much larger flooded area to breed in, and for much longer.

According to Washington DC-based climate and health specialist Kristie Ebi: “The cause-and-effect chain from climate change to changing health patterns is complex and includes factors like wealth, public health infrastructure, medical care, and access to nutrition, safe water and sanitation. The severity of future impacts will be determined by changes in climate as well as factors unrelated to climate, and by how well people adapt.”

The risks, will be much greater in low-income countries where the current burden of ill health is already high and the public health system relatively weak. Countries like the island nations of the Pacific and Papua New Guinea.

Problems in paradise

The Melanesian countries of Papua New Guinea, the Solomon Islands, Vanuatu and Fiji are especially prone to floods, cyclones and droughts as well as earthquakes and tsunamis, unrelated to climate. The age-old western perception of the Pacific as a paradise is now profoundly ironic: it is a deeply troubled region.

Papua New Guinea is a textbook example of a country that faces a cocktail of seismic disasters and worsening climatic extremes, yet is very poorly equipped to adapt. Malaria is another major challenge. For many years, Papuans have watched malaria occurring at higher and higher altitudes as the climate warmed.

The National Society in Papua New Guinea knows malaria is out there in remote highland areas where it was unknown before. But with very limited resources it is struggling to get an accurate assessment of exactly where.

Other countries such as Tuvalu and Kiribati are spread out over thousands of square kilometres and the lure of urban infrastructure and economic prospects brings people into the capitals from the remote outer islands. This puts pressure on dwindling water

resources and creates associated health problems such as diarrhoea.

Mining for sand and gravel often compounds the effect of rising sea levels and the lack of land on these small coral atolls forces people to live in areas that are flooded by frequent “king tides”. The Tuvalu Red Cross put its Emergency Response Team into action for the first time by assisting the government to evacuate people whose houses had been swamped by such a tide.

Samoan village systems remain strong and provide a safety net – and most government services are administered through them. However there is a growing number of people that fall outside this traditional support network – those moving to urban areas, for example, in the hope of better lives for their families, people immigrating to Samoa from other countries, and others denounced by fellow villagers for various misdemeanours who are left on the fringes without access to adequate health services.

These groups are vulnerable to current and future climate risks because of their socio-economic status and often their already-poor health. As part of the Samoan Red Cross climate project, a Vulnerability and Capacity Assessment is being used to try to build their resilience. Vaccinations against typhoid are being provided and other health problems addressed.

During the climate change conference organized by the Red Cross/Red Crescent Climate Centre in The Hague in 2007, representatives of many other national societies shared stories of possible climate-related changes observed in various diseases, from malaria outbreaks in Jamaica and Madagascar to dengue fever in Palau. New health risks are emerging, and the Red Cross and Red Crescent Movement needs to prepare for these changing threats.

Health and Care

How-to guide

The humanitarian mission of the Red Cross and Red Crescent is to improve the lives of vulnerable people, and their health plays a central role. As we have seen above, National Societies around the world are already grappling with new health emergencies, which are likely to be caused by climate change.

Therefore proactive adaptation strategies, policies and measures need to be taken to relieve the disease burden of the most vulnerable groups. Health impacts are likely to affect cross-cutting programmes within National Society disaster-management, risk reduction and care programmes.

But how to start?

Step 1: Collecting general background information

In order to integrate climate change effects on health, the first step is to get a good understanding of the changing risks that your country may be facing. This is part of the development of the national climate risk assessment about the impacts of climate change in the country and for your National Society (see *Getting Started: How-to guide, step 3*).

Identify all possible health related impacts in your country and

gather extra information from partner organizations and institutions, such as the health ministry and professional health care institutions.

The following questions may help to assess risks:

- Are we in contact with the right experts, organizations or institutions to understand the health risks of climate change in our country?
- Did we identify possible health impacts related to climate change in our different programmes?
- Are we aware of possible health impacts or disease outbreaks related to climate change and other vulnerabilities for all different regions in the country?

Step 2:

Assessing priorities and integrating climate change into the strategy of the National Society

Raising awareness about health impacts of climate change internally in the National Society will be a good start. Listing the main disease burden within the different target areas will be useful for prioritizing operations. As disease outbreaks are often related to extreme weather events and disasters, priorities are closely related to disaster-management response and risk-reduction activities. Health impacts can also be identified within social-care programmes.

However, it is important to integrate activities linked to climate change into other existing health-care programmes as well; for example, community-based first aid or other first aid training, participatory health promotion or prevention programmes. These should include interventions for diseases expected to increase or appear with climate change, such as diarrhoea.

Successful programmes from elsewhere can be a source of inspiration, for example the distribution of treated bed nets to prevent malaria, as part of measles and polio vaccination campaigns, with regular visits by community volunteers.

The following questions may help to prioritize and prepare for the risks:

- Are we making use of all possible weather and climate information that may help us to predict health impacts?
- Do we need to intensify capacities within our health programmes?
- Are we prepared to deal with the impacts identified, for example malnutrition, infectious disease outbreaks caused by changes in the range of vectors, heat wave related health impacts?
- Are we directing medication supplies to the right disaster prone areas?

This Niger woman and her baby received a bed net in the massive distribution campaign undertaken by the International Federation in 2005–6 to help fight malaria. Malaria is one of several diseases spread by mosquitoes which can be affected by climate change. Photo: John Haskew/International Federation of Red Cross and Red Crescent Societies



Depending on priorities, the National Society could proceed to one or more of the activities below.

Step 3: Enhancing preparedness for response and contingency planning

Identify new activities or intensify existing activities that might be effective interventions for the most common causes of ill health linked to climate change.

Questions to address:

- Can we promote or advocate public health intervention at different levels within the society?
- Is new funding needed to engage in health operations or expand existing programmes?
- What has been done in other countries (or by other organizations) to avoid vector-borne disease outbreaks, reduce vulnerability or improve bad hygienic conditions?
- Are we monitoring for diseases which may appear because of climate change? Are we prepared to deal with unfamiliar diseases by collecting information or asking advice from other National Societies who have experience with them?
- Do we need extra training for volunteers to deal with, for example, health and sanitation, or infectious diseases and displacement? Is education on how to prevent and respond to health threats integrated into ongoing education activities with local communities?

Step 4: Enhancing disaster risk reduction

Heat alerts in France or water pumps in Nicaragua have proved to be efficient ways of reducing the health impacts of climate change.

But how can we integrate health impacts structurally in our country?

- Advocacy and longer term partnerships in every layer of the society
- Large programmes like the National Heatwave Plan in the Netherlands and WHO's Euroheat programme (see www.euro.who.int)
- Community health care: Is extra training needed for volunteers? What knowledge does the local community lack? What can be done to reduce risks based on vulnerability assessments?
- Examples of practical risk reduction options: seed banks as a safety buffer, elevated food and seeds storage, water harvesting and conservation, local clean-up campaigns to eliminate vector-breeding sites, community-based educational programmes raising awareness on prevention of transmission and treatment, and early warning systems.

Step 5: Enhancing early warning

Together with other organizations, the Red Cross and Red Crescent can utilize early-warning systems to reduce health impacts of extreme weather events linked to climate change such as heatwaves, storms, floods

or droughts, as well as possible weather-linked malaria outbreaks and other diseases.

There are various websites issuing warnings of such extreme weather events and/or health impacts, or giving seasonal forecasts (see *Disaster Management*). Models predicting locations of meningitis outbreaks are being developed, which could enable targeted use of the limited amounts of vaccine available.

Questions to address:

- Who to alert among the population and relevant authorities, organizations, institutions, and the health sector? How to alert them? Which sub-populations are vulnerable and which information is necessary for effective response to warnings? What education is needed on how to respond?
- Are there forecasts of disease or allergies based on (weather-related) conditions that use models to predict health outcomes, e.g. malaria, meningitis, pollen, ozone? Are we using the information available to prepare: putting in place mosquito nets, cholera kits?
- Is active or passive surveillance in place, or should it be developed, volunteers trained (volunteers epidemic manual)?

Step 6: Awareness raising, establishing partnerships and advocacy

It is necessary to raise awareness on health impacts of climate change to enable adaptation.

In order to enlarge its scope, the International Federation has formed global alliances to address major health problems such as the Global Malaria Partnership, and works together with NGOs and UN agencies on hygiene promotion in Water and Sanitation Hygiene (WASH). These and other partnerships can be the basis for addressing health impacts of climate change.

With their branches reaching out to communities all over the world, National Societies are uniquely well placed to highlight the vulnerabilities and capacities of exposed communities and to mobilise others to respond by supporting them.

In view of the enormous health impacts of extreme weather related to climate change events, Red Cross/Red Crescent advocacy is crucial.

Questions to address:

- Is awareness-raising information tailored to the community, helping people adapt to new health situations arising with climate change?
- Is awareness raising integrated in other activities with the community?
- Is the National Society building partnerships which will help it address health impacts of climate change?
- Is the National Society engaged in advocacy which will help address the health impacts of climate change?

Step 7: Evaluation

As part of the regular evaluation effort, make sure that the National Society evaluates continuously whether health risks are changing. Every year's climate change impacts should be evaluated and projections for the coming year integrated into programmes (see *table 2*).

Checklist

- Collect general background information on possible health related climate change impacts in your country.
- Discuss within the National Society and set priorities for action.
- Assess how preparedness for disaster response and contingency planning may include the new health risks.
- Include health risks in your strategy for reducing disaster risk and if necessary address these risks in campaigns.
- Enhance early warnings for climate disease outbreaks that may be caused by climate change.
- Address climate change risks in existing health partnerships and join up in practical action, awareness raising and advocacy.

Pitfalls

There is a danger of overreacting to the outbreak of a new disease and causing panic among the population. It is therefore essential to gather correct information in order to take the right measures.

That climate change makes an area more suitable for a vector of

a disease does not automatically mean the disease will become established, as there are many other factors influencing this. As a consequence there are opportunities: to enhance the factors which prevent the disease from establishing itself, to monitor for the disease and if possible to "nip it in the bud".

Opportunities

With climate change altering the geographic coverage of certain diseases, national societies may need to strengthen collaboration in monitoring, identifying and responding to new health risks across borders. This may lead to improved health management at the regional level.

Further information

All information from this guide is available on www.climatecentre.org, including updates and links to relevant documents and sources of information, checklists, templates and best practice examples.

General Red Cross/Red Crescent guidance and policies on health, e.g. information on health in emergencies, water and sanitation, and epidemics, are available at www.ifrc.org.

The website of the World Health Organization (www.who.int) has information about many health issues, including interactions with climate change.

Table 2: An overview of health risks related to climate change

Possible climate change impacts on health	Disease and premature death	Mechanisms	Possible adaptation measures
Change in range of infectious-disease vectors	Malaria, dengue, West Nile virus, leishmaniasis, Lyme disease, schistosomiasis	Diseases are transmitted by vectors or intermediate hosts (mosquitoes, sand flies, ticks, snails, rodents). Climate change can shift distribution of vectors/hosts, and/or lead to changes in transmission season. Effects on malaria are mixed depending on region. Cattle is vulnerable as well: e.g. Rift Valley Fever, blue tongue, which can have impacts on food supplies.	Additional surveillance to identify and prevent epidemics if vectors change their range. Medical training, increased medical supplies in new areas. Early warning systems, community education, awareness, mobilization, use of bed nets (long-lasting insecticidal), vector management measures, e.g. local clean-up campaigns to eliminate mosquito breeding sites.
Diseases increasing with higher temperatures, humidity or drought	Diarrhoeal disease, cholera, meningitis, skin disease, food poisoning	Temperature directly affects incidence of diarrhoeal diseases. Malnutrition is a possible consequence of diarrhoeal disease. Meningitis is associated with drought. Food poisoning: e.g. contaminated shell fish, salmonellosis are linked to temperature.	Monitoring water and food quality, access to safe water, sanitation, drainage, health education, hygiene promotion, oral rehydration. Medical training, increased medical supplies.
Deaths and injuries and disease from extreme-weather events: storms, hurricanes, intense rainfall, floods and/or droughts and bushfires	Disasters: risk of immediate death and injury, mental-health effects Increased risk of waterborne diseases, malaria, dengue, diarrhoeal disease, cholera Malnutrition	Death and injury are due to flooding, storm damage (loss of infrastructure, housing), land slides, riverbank erosion etc. A number of vectors can breed in water after extreme weather events such as storms or floods. Leptospirosis (Weil's diseases) can be transmitted through contact with by rodents/pathogens after floods. Extreme rainfall or drought can cause microbial or chemical contamination of water or insufficient water, increasing risk of disease. Drought/flooding can lead to crop failure and consequent malnutrition. Displacement of population, loss of income can lead to malnutrition and disease.	Disaster management, Community risk reduction, Vulnerability and Capacity Assessment. Early-warning systems for vulnerable areas, evacuation training, trained volunteers, planting mangrove trees for coastal zone protection, shelters, higher storage spaces for food and seeds, higher houses, retention walls, dams, change in crop varieties and planting times/livestock, harvesting, conserving water, water reservoirs, fire breaks, teaching new income-generating skills in towns.

Possible climate change impacts on health	Disease and premature death	Mechanisms	Possible adaptation measures
Deaths and injuries and disease from extreme-weather events: heatwaves; increase in temperatures	Heat-related mortality, heat stress, heat stroke, dehydration, heart failure. Diseases linked to temperature increase (see above).	During heatwaves vulnerable groups are at risk: urban poor, elderly, babies, chronically ill and certain occupations. Some benefits: fewer deaths from cold are outweighed by negative effects. Snow decrease, glacier melt possibly lead to seasonal lack of water.	Early-warning systems, heat alarms through media, warning organizations concerned, education on medical impacts (within first-aid and social-care programmes), raising awareness of all risks.
Diseases related to air quality	Cardio-respiratory morbidity and mortality	Risks for air quality are due to: formation of ground-level ozone in urban areas with heat and sunlight; pollution from forest fires; changes in distribution and seasonality of allergenic pollen species, e.g. <i>Ambrosia artemisiifolia</i> .	Warning systems. Medical education. Raising awareness of all risks. Substantial health benefits from actions to reduce greenhouse gas emissions.
Effects of sea-level rise: salt-water intrusion and coastal erosion	Malnutrition, water-borne diseases	Effects of floods are listed above. Sea level rise will affect livelihood, agriculture: loss of crops, shortage of sweet water resources; loss of income from tourism, etc may lead to malnutrition. Displacement of populations may intensify malnutrition and diseases. These effects may be enhanced by coral bleaching/damage and decline of fisheries.	Education programmes for farmers by experts on different crop opportunities; planting of mangroves, protecting reefs.

From IPCC Working Group II (2007)

Glossary

Adaptation

Adjustments in response to actual or expected climate change, to reduce negative impacts or take advantage of opportunities.

Climate

The average weather. The mean and variability of temperature, rainfall, wind etc. over a relatively long period of time (typically 30 years). One popular phrase can help distinguish weather from climate: “Climate is what you expect. Weather is what you get”.

Climate change

Any change in climate over time. In principle, climate change can be due to natural processes or a result of human activity. The media often refers to “global warming” (an increase in the average temperature of our planet), which is actually just one manifestation of global climate change. Other manifestations include changes in rainfall patterns and in the frequency or intensity of extreme weather events. In the context of the United Nations Framework Convention on Climate Change (UNFCCC), the term is linked to human activities that alter the composition of the atmosphere, particularly greenhouse-gas emissions due to burning of fossil fuels.

Climate risk management

An approach to systematically manage climate-related risks

affecting activities, strategies or investments, by taking account of the risk of current variability and extremes in weather as well as long-term climate change.

From a Red Cross/Red Crescent perspective, climate risk management is doing what we have always done in terms of disaster management, health and care, food security and so on, but paying attention to (1) the way risks are changing, and (2) options to reduce the risks in addition to being prepared to respond after the event.

Coastal erosion

Landward movement of the shoreline due to the forces of waves and currents. Coastal erosion can get worse due to sea level rise and more intense storms associated with climate change.

Community-based disaster preparedness (CBDP)

A process that seeks to develop and implement strategies and activities for disaster preparedness (and often risk reduction) that are locally appropriate and locally “owned”.

Complex disaster

A disaster that has no single root cause (such as a storm) but emerges due to a combination of factors, which may involve an extreme weather event, conflict

and/or migration, environmental degradation and other issues. Complex emergencies are becoming more likely due to climate change, which may alter hazards and amplify underlying vulnerabilities.

Disaster

A situation in which the impact of a hazard (such as a storm or other extreme weather event) negatively affects vulnerable individuals or communities, to a degree that their lives are directly threatened or sufficient harm is done to economic and social structures to undermine their ability to survive or recover.

Disaster (risk) management

A systematic process of implementing policies, strategies, and measures to reduce the impacts of natural hazards and related environmental and technological disasters. This includes, among other things, disaster risk reduction, preparedness, response, recovery and rehabilitation.

Disaster preparedness

Activities that contribute to the pre-planned, timely and effective response of individuals and communities to reduce the impact and deal with the consequences of a (future) disaster.

Disaster recovery

Decisions and actions taken after a disaster with a view to restoring

or improving the pre-disaster living conditions of the stricken community.

Disaster rehabilitation

The set of actions taken after a disaster to enable basic services to resume functioning, to repair physical damage and community facilities, to revive economic activities and support the psychological and social well-being of the survivors.

Disaster relief/response

Coordinated activities aimed at meeting the needs of people who are affected by a disaster.

Disaster risk reduction

Measures at all levels to curb disaster losses, through reducing exposure to different hazards, and reducing the vulnerability of populations. Effective disaster risk-reduction practices use a systematic approach to reduce human, social, economic and environmental vulnerability to natural hazards.

Early warning

Providing timely and effective information about an imminent hazard that allows people to take action to avoid a disaster or prepare for effective response. Early-warning systems depend on a chain of things: understanding and mapping the hazard; monitoring and forecasting; processing and disseminating understandable warnings to political authorities and the population; and undertaking the right, timely actions in response to the warnings.

El Niño-Southern Oscillation (ENSO)

An anomaly in sea surface temperature and atmospheric pressure in the tropical Pacific Ocean that occurs roughly every four to seven years and can lead to changes in seasonal rainfall in certain regions of the planet (large parts of Africa, Latin America, South East Asia and the Pacific). An ENSO cycle includes two phases: El Niño and la Niña.

Extreme weather event

Weather that is extreme and rare in a particular place, such as extremely intense rainfall, extreme heat, a very strong windstorm. By definition, the characteristics of what is called “extreme weather” vary from place to place. Often it is defined as something that on average has happened less than once every thirty, fifty or a hundred years.

Global warming

The rise in average temperature on earth due to the increasing amounts of greenhouse gases in the atmosphere. The media often uses this term to refer to “climate change” (a concept that includes global warming as well as other changes).

Greenhouse gas (GHG)

A gas, such as carbon dioxide and methane, that absorbs and re-emits infrared radiation. When pollution adds these gases to the earth’s atmosphere, they trap more solar energy in our planet (like in a greenhouse) warming the earth’s surface and contributing to climate change.

Hazard

A potentially damaging physical event that may cause loss of life or injury, property damage, social and economic disruption or environmental degradation.

Humanitarian values

The values that shape humanitarian action. Values based on the Fundamental Principles of the Red Cross and Red Crescent Movement include the protection of life, health and human dignity, respect for others and the acceptance of responsibility to help others without discrimination based on nationality, race, gender, religious beliefs, class or political opinions.

Hurricane

See Tropical cyclone

International Federation (of Red Cross and Red Crescent Societies)

The world’s largest humanitarian organization. Founded in 1919, the International Federation comprises 186 member Red Cross and Red Crescent societies, a Secretariat in Geneva and more than 60 delegations strategically located to support activities around the world.

Intergovernmental Panel on Climate Change (IPCC)

The most credible source of knowledge on climate change, IPCC is a panel established in 1988 to assess scientific, technical and socio-economic information. Every five or six years, it produces assessments based mainly on peer reviewed

and published scientific/technical literature on climate change, its potential impacts, and options for adaptation and mitigation.

Kyoto Protocol

The first protocol to the United Nations Framework Convention on Climate Change (UNFCCC, the international treaty on climate change). It assigns legally binding commitments for industrialized countries to reduce their greenhouse-gas emissions by 2012, and includes some funding mechanisms for adaptation to climate change. The Kyoto Protocol was adopted in 1997 and entered into force in 2005. It is expected to be followed by a second protocol to the UNFCCC, which should be ready for ratification in 2009.

Mitigation

This word has different meanings for practitioners in the climate change and disaster-management communities, often leading to confusion:

Mitigation (climate change)

Measures to reduce greenhouse-gas concentrations in the atmosphere, and thus ultimately the magnitude of climate change. Measures include energy conservation, using renewable energy such as wind or solar energy instead of coal, oil or gas; and planting trees that absorb carbon dioxide from the atmosphere.

Mitigation (disaster management)

Measures aimed at moderating or reducing the severity of disaster impact. They include

such things as building retention walls, water reservoirs, and reforestation to avoid landslides. From the perspective of the climate change community, these measures would be labeled as “adaptation” because they help reduce the negative impacts of climate change.

Monsoon

A seasonal prevailing wind in tropical and sub-tropical regions. It lasts for several weeks and leads to substantial changes in rainfall.

National Society

Red Cross or Red Crescent society of a given country, and member of the International Federation.

Natural hazards

Natural events that may harm people or their assets. Natural hazards can be classified by origin: *geological* (such as earthquakes and volcanic eruptions), *hydrometeorological* (such as floods, heatwaves, storms) or *biological* (such as pests and locust swarms). Some natural hazards can be more likely to occur with human induced climate change.

Precipitation

Rain, snow or hail.

Recovery

See *Disaster recovery*

Reconstruction

See *Disaster reconstruction*

Risk

The probability of harmful consequences due to interaction between hazards and vulnerable conditions.

Salt-water intrusion

Increase of salinity in underground freshwater located close to the coast. It can be caused by excessive withdrawal of water from the freshwater source (aquifer) or by sea-level rise.

Sea-level rise

An increase in the average level of the sea or ocean. The global sea level is rising as a result of increasing global temperature because: (1) melting of ice in mountains and glaciers leads to more water in the ocean, and (2) warmer water in the oceans expands, occupying more volume. Local sea levels are determined by a combination of the global sea-level rise and the local rise or subsidence of the land (for instance due to geological processes).

Seasonal forecasting

Forecasting of probable weather conditions in a certain region during a certain period (for instance a month, or a season) based on observed and projected oceanic and atmospheric conditions. These projections, sometimes months in advance, can help prepare for various emergencies, from hurricanes to malaria.

Tropical cyclone

(sometimes called *just cyclone*) A violent, rotating storm with heavy wind and rain. The most

severe versions are called hurricanes (in the North Atlantic, the Northeast Pacific east of the dateline, or the South Pacific east of 160E) or typhoon (in the Northwest Pacific west of the dateline). Tropical cyclones only form and intensify above warm water, and are probably becoming more intense due to the warming of the ocean surface caused by global warming.

Typhoon

See *Tropical cyclone*

United Nations Framework Convention on Climate Change (UNFCCC)

A global treaty aimed to avoid dangerous climate change by reducing greenhouse gas emissions and supporting developing countries to cope with the unavoidable changes. Decisions are taken by the Conference of the Parties (COP), which meets every year. The UNFCCC was signed in 1992 and ratified by most nations in 1994.

Vector-borne disease

A disease transmitted by an insect or other organism (the vector). Examples include malaria and dengue. Vector-borne diseases can be affected by climate because temperature and rainfall affect the distribution of the vector and/or the transmission season.

Vulnerability

The degree to which someone or something can be affected by a particular hazard (from sudden events such as a storm

to long-term climate change). Vulnerability depends on physical, social, economic and environmental factors and processes. It is related, for instance, to the places where people live, the strength of their houses, the extent to which their crops can survive adverse weather, or whether they have organized evacuation routes and shelters.

- *Physical* vulnerability relates to the built environment and may be described as “exposure”
- *Social* vulnerability is caused by such things as levels of family-ties and social networks literacy and education, health infrastructure, the state of peace and security
- *Economic* vulnerability is suffered by people of less-privileged class or caste, ethnic minorities, the very young and old etc. They suffer proportionally larger losses in disasters and have limited capacity to recover. Similarly, an economy lacking a diverse productive base is less likely to recover from disaster impact which may also lead to forced migration
- *Environmental* vulnerability refers to the extent of natural-resource degradation, such as deforestation, depletion of fish stocks, soil degradation and water scarcity which threaten food security and health.

Vulnerability and Capacity Assessment (VCA)

A tool widely used by the Red Cross and Red Crescent to identify the strengths and weaknesses of people facing disaster risk. The VCA process

helps uncover key community risks and is used to plan strategies for reducing them. During an assessment, information is gathered by means of community maps, historical and seasonal calendars, asset inventories, livelihood and other surveys, and interviews with local people. “Transect walks” are also held in which Red Cross/Red Crescent staff and volunteers walk through a community with its inhabitants, learning of key hazards and the area’s social and physical features. Additional information then provides context and validation for the community-based findings.

This glossary builds on definitions provided by sources including the International Federation of Red Cross and Red Crescent Societies, the Intergovernmental Panel on Climate Change Fourth Assessment Report, and the United Nations Development Programme/Global Environment Facility Adaptation Policy Frameworks, the United Nations International Strategy for Disaster Reduction. Definitions have been shortened or adjusted to meet audience requirements.

Acronyms

AIDS Acquired Immune Deficiency Syndrome	IRI International Research Institute for Climate and Society
CBDP Community-based Disaster Preparedness	NAPA National Adaptation Programme of Action
CBDR Community-based Disaster Reduction	NGO Non-governmental organization
COP Conference of the Parties (to the UN Framework Convention on Climate Change)	RRCS Rwandan Red Cross Society
DM Disaster Management	UNDP United Nations Development Programme
DMIS Disaster Management Information System (International Federation)	UNEP United Nations Environment Programme
DRR Disaster Risk Reduction	UNFCCC United Nations Framework Convention on Climate Change
ERCS Ethiopian Red Cross Society	UN/ISDR United Nations International Strategy for Disaster Reduction
ERU Emergency Response Unit	WHO World Health Organization
FACT Field Assessment and Coordination Team	WMO World Meteorological Organization
GEF Global Environment Facility	WPNS Well-prepared National Society
HIV Human Immunodeficiency Virus	VCA Vulnerability and Capacity Assessment
IATF/DR Inter-Agency Task Force on Disaster Reduction	
ICRC International Committee of the Red Cross	
IPCC Intergovernmental Panel on Climate Change	

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Further sources of information on climate change can be found on the Climate Centre website www.climatecentre.org

Annex: regional impacts of climate change

Extracted from IPCC (2007), Impacts, Vulnerability and Adaptation. Contribution of Working Group II to the IPCC Fourth Assessment Report.

Africa

- By 2020, between 75 million and 250 million people are projected to be exposed to increased water stress due to climate change. If coupled with increased demand, this will adversely affect livelihoods and exacerbate water-related problems.
- Agricultural production, including access to food, in many African countries and regions is projected to be severely compromised by climate variability and change. The area suitable for agriculture, the length of growing seasons and yield potential, particularly along the margins of semi-arid and arid areas, are expected to decrease. This would further adversely affect food security and exacerbate malnutrition in the continent. In some countries, yields from rain-fed agriculture could be reduced by up to 50 per cent by 2020.
- Local food supplies are projected to be negatively affected by decreasing fisheries resources in large lakes due to rising water temperatures, which may

- be exacerbated by continued over-fishing.
- Towards the end of the 21st century, projected sea-level rise will affect low-lying coastal areas with large populations. The cost of adaptation could amount to at least 5–10 per cent of Gross Domestic Product (GDP). Mangroves and coral reefs are projected to be further degraded, with additional consequences for fisheries and tourism.
 - New studies confirm that Africa is one of the most vulnerable continents to climate variability and change because of multiple stresses and low adaptive capacity. Some adaptation to current climate variability is taking place; however, this may be insufficient for future changes in climate.

Asia

- Glacier melt in the Himalayas is projected to increase flooding, and rock avalanches from destabilised slopes, and to affect water resources within the next two to three decades. This will be followed by decreased river flows as the glaciers recede.
- Freshwater availability in Central, South, East and South-East Asia, particularly in large river basins, is projected to decrease due to climate change which, along with population growth and

increasing demand arising from higher standards of living, could adversely affect more than a billion people by the 2050s.

- Coastal areas, especially heavily-populated megadelta regions in South, East and South-East Asia, will be at greatest risk due to increased flooding from the sea and, in some megadeltas flooding from the rivers.
- Climate change is projected to impinge on the sustainable development of most developing countries of Asia, as it compounds the pressures on natural resources and the environment associated with rapid urbanization, industrialization, and economic development.
- It is projected that crop yields could increase up to 20 per cent in East and South-East Asia while they could decrease up to 30 per cent in Central and South Asia by the mid-21st century. Taken together, and considering the influence of rapid population growth and urbanization, the risk of hunger is projected to remain very high in several developing countries.
- Endemic morbidity and mortality due to diarrhoeal disease primarily associated with floods and droughts are expected to rise in East, South and South-East Asia due to projected changes in the

hydrological cycle associated with global warming. Increases in coastal water temperature would exacerbate the abundance and/or toxicity of cholera in South Asia.

Australia and New Zealand

- As a result of reduced precipitation and increased evaporation, water security problems are projected to intensify by 2030 in southern and eastern Australia and, in New Zealand, in Northland and some eastern regions.
- Significant loss of biodiversity is projected to occur by 2020 in some ecologically rich sites including the Great Barrier Reef and Queensland Wet Tropics. Other sites at risk include Kakadu wetlands, south-west Australia, sub-Antarctic islands and the alpine areas of both countries.
- Ongoing coastal development and population growth in areas such as Cairns and South-east Queensland (Australia) and Northland to Bay of Plenty (New Zealand), are projected to exacerbate risks from sea-level rise and increases in the severity and frequency of storms and coastal flooding by 2050.
- Production from agriculture and forestry by 2030 is projected to decline over much of southern and eastern Australia, and over parts of eastern New Zealand, due to increased drought and fire. However, in New Zealand,

initial benefits are projected in western and southern areas and close to major rivers due to a longer growing season, less frost and increased rainfall.

- The region has substantial adaptive capacity due to well developed economies and scientific and technical capabilities, but there are considerable constraints to implementation and major challenges from changes in extreme events. Natural systems have limited adaptive capacity.

Europe

- For the first time, wide-ranging impacts of changes in current climate have been documented: retreating glaciers, longer growing seasons, shift of species ranges, and health impacts due to a heat wave of unprecedented magnitude. The observed changes described above are consistent with those projected for future climate change.
- Nearly all European regions are anticipated to be negatively affected by some future impacts of climate change, and these will pose challenges to many economic sectors. Climate change is expected to magnify regional differences in Europe's natural resources and assets. Negative impacts will include increased risk of inland flash floods, and more frequent coastal flooding and increased erosion (due to storminess and sea-level rise). The great majority of organisms and ecosystems will have diffi-

culty adapting to climate change. Mountainous areas will face glacier retreat, reduced snow cover and winter tourism, and extensive species losses (in some areas up to 60 per cent under high emission scenarios by 2080).

- In Southern Europe, climate change is projected to worsen conditions (high temperatures and drought) in a region already vulnerable to climate variability, and to reduce water availability, hydropower potential, summer tourism and, in general, crop productivity. It is also projected to increase health risks due to heat waves, and the frequency of wildfires.
- In Central and Eastern Europe, summer precipitation is projected to decrease, causing higher water stress. Health risks due to heat waves are projected to increase. Forest productivity is expected to decline and the frequency of peatland fires to increase.
- In Northern Europe, climate change is initially projected to bring mixed effects, including some benefits such as reduced demand for heating, increased crop yields and increased forest growth. However, as climate change continues, its negative impacts (including more frequent winter floods, endangered ecosystems and increasing ground instability) are likely to outweigh its benefits.
- Adaptation to climate change is likely to benefit from experience

gained in reaction to extreme climate events, specifically by implementing proactive climate change risk management adaptation plans.

Latin America

- By mid-century, increases in temperature and associated decreases in soil water are projected to lead to gradual replacement of tropical forest by savanna in eastern Amazonia. Semi-arid vegetation will tend to be replaced by arid-land vegetation. There is a risk of significant biodiversity loss through species extinction in many areas of tropical Latin America.
- In drier areas, climate change is expected to lead to salinization and desertification of agricultural land. Productivity of some important crops is projected to decrease and livestock productivity to decline, with adverse consequences for food security. In temperate zones soybean yields are projected to increase.
- Sea-level rise is projected to cause increased risk of flooding in low-lying areas. Increases in sea surface temperature due to climate change are projected to have adverse effects on Mesoamerican coral reefs, and cause shifts in the location of south-east Pacific fish stocks.
- Changes in precipitation patterns and the disappearance of glaciers are projected to significantly affect water availability for human

consumption, agriculture and energy generation.

- Some countries have made efforts to adapt, particularly through conservation of key ecosystems, early warning systems, risk management in agriculture, strategies for flood drought and coastal management, and disease surveillance systems. However, the effectiveness of these efforts is outweighed by: lack of basic information, observation and monitoring systems; lack of capacity building and appropriate political, institutional and technological frameworks; low income; and settlements in vulnerable areas, among others.

North America

- Warming in western mountains is projected to cause decreased snowpack, more winter flooding, and reduced summer flows, exacerbating competition for over-allocated water resources.
- Disturbances from pests, diseases and fire are projected to have increasing impacts on forests, with an extended period of high fire risk and large increases in area burned.
- Moderate climate change in the early decades of the century is projected to increase aggregate yields of rain-fed agriculture by 5–20 per cent, but with important variability among regions. Major challenges are projected for crops that are near the warm end of their suitable range or which

depend on highly utilized water resources.

- Cities that currently experience heat waves are expected to be further challenged by an increased number, intensity and duration of heat waves during the course of the century, with potential for adverse health impacts. Elderly populations are most at risk.
- Coastal communities and habitats will be increasingly stressed by climate change impacts interacting with development and pollution. Population growth and the rising value of infrastructure in coastal areas increase vulnerability to climate variability and future climate change, with losses projected to increase if the intensity of tropical storms increases. Current adaptation is uneven and readiness for increased exposure is low.

Polar Regions

- In the Polar regions, the main projected biophysical effects are reductions in thickness and extent of glaciers and ice sheets, and changes in natural ecosystems with detrimental effects on many organisms including migratory birds, mammals and higher predators. In the Arctic, additional impacts include reductions in the extent of sea ice and permafrost, increased coastal erosion, and an increase in the depth of permafrost seasonal thawing.

- For human communities in the Arctic, impacts, particularly those resulting from changing snow and ice conditions, are projected to be mixed. Detrimental impacts would include those on infrastructure and traditional indigenous ways of life.
- Beneficial impacts would include reduced heating costs and more navigable northern sea routes.
- In both polar regions, specific ecosystems and habitats are projected to be vulnerable, as climatic barriers to species invasions are lowered.
- Arctic human communities are already adapting to climate change, but both external and internal stressors challenge their adaptive capacities. Despite the resilience shown historically by Arctic indigenous communities, some traditional ways of life are being threatened and substantial investments are needed to adapt or re-locate physical structures and communities.

Small islands

- Small islands, whether located in the tropics or higher latitudes, have characteristics which make them especially vulnerable to the effects of climate change, sea-level rise and extreme events.
- Deterioration in coastal conditions, for example through erosion of beaches and coral bleaching, is expected to affect local resources, e.g., fisheries,

and reduce the value of these destinations for tourism.

- Sea-level rise is expected to exacerbate inundation, storm surge, erosion and other coastal hazards, thus threatening vital infrastructure, settlements and facilities that support the livelihood of island communities.
- Climate change is projected by mid-century to reduce water resources in many small islands, e.g., in the Caribbean and Pacific, to the point where they become insufficient to meet demand during low-rainfall periods.
- With higher temperatures, increased invasion by non-native species is expected to occur, particularly on mid- and high latitude islands.

Marsabit, Kenya: rough terrain and a lack of paved roads make access difficult for Red Cross vehicles trying to reach remote villages. Photo: Daniel Cima/American Red Cross



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