

Developing Effective Adaptation Strategies

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The chapter will explore the current policy options and processes for developing effective adaptation strategies to respond to climate change. The chapter builds on information in earlier chapters that have addressed the impacts of climate change on health (Chapter 1) and the effectiveness of public health responses to address climate variability and climate change (Chapter 2).

Climate change is a cross-border issues that requires international cooperation. The countries least responsible for anthropogenic greenhouse gas emissions are those likely to be most affected. In recognition of this global inequity, there are several international processes underway to support adaptation in low and middle income countries.

Climate change is a rapidly emerging issue for the health sector. Appropriate methods and tools for assessing the potential impacts of climate change and developing adaptation responses are being developed for local and national governments. This chapter will discuss the methods and tools available for health decision-making.

All impacts are local, and adaptation strategies must reflect local systems and priorities. Therefore, this chapter illustrates the adaptation process with examples of good practice from three countries that are particularly vulnerable to climate change impacts: Bangladesh, Samoa and the Maldives.

For many countries, financial assistance for adaptation strategies will be required. Many countries and multi-lateral funding agencies are currently reviewing their development assistance in light of the challenges of climate change. This is often framed in the context of climate-resilient development. A paper on opportunities for funding for adaptation in the health sector has been prepared for the Commonwealth Health Ministers' Meeting 2009¹ which will focus this year on Climate Change and Health¹.

All countries need to incorporate climate change issues into their mainstream decision-making. With respect to health, this will include an assessment of how climate change will affect current public health and disease control strategies. The health implications of adaptation strategies outside the health sector also need to be considered. Addressing climate change will require an improved understanding of climate and environmental risks to health.

The World Health Organization (WHO) has been supporting its Member States on the issues of climate change for many years. Most recently, the 61st World Health Assembly in 2008 recognised the potentially serious implications of climate change for human health. The subsequent WHA declaration² therefore urged Member States to undertake the following:

1. To develop health measures and integrate them into plans for adaptation to climate change as appropriate.
2. To build the capacity of public health leaders to be proactive in providing technical guidance on health issues, be competent in developing and implementing strategies for addressing the effects of, and adapting to, climate change, and show leadership in supporting the necessary rapid and comprehensive action.
3. To strengthen the capacity of health systems for monitoring and minimizing the public health impacts of climate change through adequate preventive measures, preparedness, timely response and effective management of natural disasters.
4. To promote effective engagement of the health sector and its collaboration with all related sectors, agencies and key partners at national and global levels in order to reduce the current and projected health risks from climate change.
5. To express commitment to meeting the challenges posed to human health by climate change, and to provide clear directions for planning

actions and investments at the national level in order to address the health effects of climate changes.

Each WHO regional office is now developing an action plan on climate change. As of March 2009, the status of these plans was as follows:

- ◆ The African Region (AFRO) has a regional framework for action on climate change and health, and climate change is included in the Libreville Declaration on Health and Environment, signed by most Environment and Health ministers³.
- ◆ Eastern Mediterranean (EMR) and American Region (PAHO) Regions have both developed regional plans of action which are backed by resolution of the regional committees^{4,5}.
- ◆ The South East Asian (SEARO) and Western Pacific (WPR) Regions have developed a Regional Framework for Action⁶ and the New Delhi Declaration on the Impacts of Climate Change on Human Health⁷.
- ◆ The European region (EURO) is drafting a declaration on climate change and health to be discussed at the Ministerial Conference on Environment and Health in 2010 in Milan, Italy.

The 2008 World Health Assembly requested the Director-General to develop appropriate methods and tools to assist Member States in assessing their health risks from climate change and in identifying and

implementing effective response measures.

National assessments of impacts, vulnerability and adaptation

Vulnerability to climate change and health priorities vary greatly between and within countries. It is therefore important that national or sub national assessments of impacts and vulnerability are undertaken in order to inform decision making. Guidance for undertaking health impacts assessment was first published in 2003⁸. WHO is currently in the process of developing updated guidance for 'Conducting Assessments of Health Vulnerability and Public Health Adaptation to Climate Change'. It is anticipated that the guidance will be available by the end of 2009.

Several countries have undertaken assessments of impacts of climate change on health. The assessments reflect the differing health priorities and climate change vulnerability. High income countries that have recently published their assessments include the United Kingdom⁹, Portugal¹⁰, and Australia and New Zealand¹¹. The focus of the assessments has shifted from science-based questions to more policy related ones.

The national assessments are only just beginning to include more formal assessment of adaptation policy options. The recent assessment from Canada includes an appraisal of the adaptive capacity of the Canadian public health system¹². The health sector in Canada needs to maintain current efforts to protect health from climate related risks, and incorporate climate information and engage other sectors in plans for future programmes. The report concluded that regional and community level assessments are needed to support adaptation.

In Europe, many governments have begun to demand estimates of the costs of inaction on climate change (impacts) and the costs of adaptation (preventing or reducing impacts). For example, the EC-funded PESETA study estimated the costs in terms of years of life lost of the health impacts of climate change¹³.

Impacts and adaptation assessments in low and middle income countries have been supported by international agencies with the objective of both assessment and capacity building. The key mechanism for the least developed countries is now the National Adaptation Programmes of Action (NAPA) process under the UNFCCC (see below).

Currently capacity for undertaking climate change impact assessments is low in many countries. However, as interest in climate change and health is growing, and the evidence base is improving, in-country capacity will increase.

International policy process on climate change – the UNFCCC

UN Framework Convention on Climate Change (UNFCCC) was signed at United Nations Conference on Environment and Development in 1992. Governments that become Parties to the Convention agree to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The Kyoto Protocol came into force February 2005 and contains legally binding commitments, for high income (Annex 1) countries to reduce national greenhouse gas emissions by at least 5% below 1990 levels in the period 2008 to 2012. Key decisions will be made regarding future emissions cuts at the next COP/MOP in Copenhagen in December this year.

Adaptation is also prominent in the Convention and is mentioned in several Articles. In summary, the Convention makes explicit that

developed country Parties shall provide support to developing countries in meeting the costs of adaptation to those adverse impacts of climate change. However, health is not mentioned specifically, and disaster reduction is only mentioned once.

All countries that are parties to the United Nations Framework Convention on Climate Change are mandated to undertake vulnerability and adaptation assessments. Often these are included as part of the National Communications to the UNFCCC. The national communications have not yet been reviewed to see how health issues are included.

The Bali Action Plan (2007) identified the need for enhanced action on adaptation by Parties to the Convention. However, the funding of adaptation, scale, and modes of delivery are still under discussion through the Ad Hoc working Group on Long-term Cooperative Action under the Convention (AWG-LCA). Key decisions on the Adaptation Fund will be made at the MOP/COP in Copenhagen in December. There are also enhanced activities on disaster risk reduction as part of adaptation.

The Nairobi Work Programme is a five year programme (2005–2010) implemented by Parties, intergovernmental and non-governmental organisations, the private sector, communities and other stakeholders to support vulnerability and adaptation assessment. The NWP has six areas of work, including:

- ◆ methods and tools;
- ◆ climate-related risks and extreme events;
- ◆ adaptation planning and practices.

The reports and further information are available from the NWP website¹.

In recognition of the need for financial support for adaptation, the Adaptation Fund was established under the UNFCCC to finance concrete adaptation projects and programmes in developing country Parties to the Kyoto Protocol that are particularly vulnerable to the adverse effects of climate change. The Adaptation Fund is financed from the share of proceeds on the clean development mechanism project activities and other sources of funding. The Adaptation Fund is supervised and managed by the Adaptation Fund Board. So far, relatively few projects have been funded and the Board has been criticised for taking too long to process applications.

National adaptation programmes of action

National adaptation programmes of action (NAPAs) provide a process for Least Developed Countries (LDCs) to identify priority activities that respond to their urgent and immediate needs to adapt to climate change. The NAPA process of the UNFCCC has helped many countries to prioritise adaptation options^{14,15} in the context of discreet project that could be funded by the Adaptation Fund or other sources.

The NAPA documents and a database of NAPA projects are available online on the UNFCCC website². Health issues have been included in many NAPAs, demonstrating increased interest in health risks, and cross-sectoral political will to prioritise health projects within adaptation planning.

Country experiences

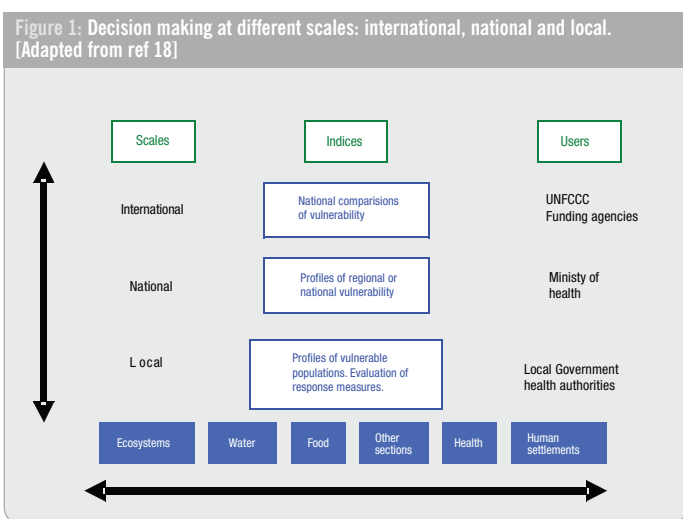
Samoa

Vulnerability

Samoa is a small island developing state and is vulnerable to the effects

¹ http://unfccc.int/national_reports/napa/items/2719.php

² http://unfccc.int/adaptation/sbsta_agenda_item_adaptation/items/3633.php



of climate change due to its small physical size, relative isolation, limited natural resources such as water, growing population, under-developed infrastructure and limited financial and human resources. Approximately 70% of Samoa's population and infrastructure are concentrated in the low-lying coastal areas and are vulnerable to coastal flooding exacerbated by sea level rise. Adverse climate change impacts are already observed in Samoa – two highly disastrous cyclones occurred in the early 1990s causing widespread damage to the vulnerable sectors described above. Five forest fires since the early 1980s have resulted from prolonged periods of drought and dry weather.

As the social sectors such as health are heavily subsidised, threats to the economy further compromise the ability of the health sector to deal with the health of the people and communities, taking into account the already heavy burden of disease and disability it deals with. Health also has direct linkages with other highly vulnerable sectors such as agriculture (food security), environment, and water (quality and quantity).

The adaptation process

Samoa ratified the UNFCCC in 1994. The National Focal Point for climate change is the Ministry of Natural Resources and Environment which coordinated the early development of Samoa's National Adaptation Program of Action (NAPA)²⁰. Nine strategic projects were identified for addressing the immediate and urgent needs (Table 1). A Climate Change Synthesis Report was first developed to incorporate sectoral evaluation assessment reports. This allowed for the establishment of baseline information and the integration of any adaptation responses with existing plans such as the overall Samoa Development Strategy, specific sector plans such as the Health Sector Plan and Coastal Infrastructure Management Plan; and synergies with other multi-lateral agreements and frameworks for action such as the Convention on Biological Diversity. Countrywide community consultations resulted in criteria prioritisation and ranking of key adaptation needs.

The Samoa health sector's work on climate change predates the 61st WHA (2008) declarations for climate change to member countries by several years. Key health concerns for Samoa, as articulated in its NAPA, include vector-borne diseases, food and water-borne diseases, acute respiratory infections, malnutrition and injuries and loss of life to extreme climatic events such as tropical cyclones, drought and floods.

It is acknowledged that there is much already being done in the sector

that addresses the impacts of climate change and variability on health. This includes current work in strengthening communicable disease surveillance and response, revitalization and strengthening of Primary Health Care, strengthening of health promotion, creation and strengthening of Health Partnerships and Alliances, and strengthening the overall Samoa Health System.

The traditional approach in public health to improve general sanitation, safeguard food security and food supplies, ensure safe and clean water for the general population and encouraging the building of good solid shelters; continues to be the generic approach that likewise incorporates the protection of people from climate change. As an under-resourced country, Samoa acknowledges it cannot rely solely on a vertical and programmatic approach to realise all of its climate change health adaptation needs. Nevertheless, the NAPA prioritisation process has been well worthwhile, having identified key project areas in health in which it can supplement existing activities and address gaps in current sector resources and prioritisations relative to climate and health adaptation needs.

The NAPA project profile for health identifies the promotion of 'climate and health' awareness; and establishment of a database as well as research and training programmes, that will enable the health sector to strengthen its early response rate to any outbreak of diseases relating to changes in climate. It further identifies the establishment of partnerships between the health sector and the meteorology sector to realise an early warning surveillance system that will facilitate better planning and deployment of specific promotional and prevention campaigns to the vulnerable communities.

As summarised in Table 1, almost all of the nine immediate and urgent adaptation activities outlined by NAPA, are already either in implementation or about to realise implementation.

Bangladesh

Vulnerability

Key climate change vulnerability contexts for Bangladesh can be characterised as a) salinity intrusion and coastal inundation, b) changes characteristics of rainfall and temperature, c) changes characteristics of drought, d) changes of nature of cyclone and storm surges, and d) changes characteristics of flood both riverine and flash flood. Many of the above are not new but there will be changes in frequency, magnitude and the timing of occurrence. The most impacted sectors identified are likely to be water resources; agriculture; human settlement; health; biodiversity (particularly in the Sundarbans); infrastructure and industries. The coastal zone of Bangladesh, including coastal island, is the most vulnerable region of the country due to its low lying topography, geographical location, concentration of poor community and exposure to sea level rise, salinity intrusion, cyclone and storm surges, coastal inundation and drainage congestion.

The adaptation process

Government of the People's Republic of Bangladesh has formulated the National Adaptation Programme of Action (NAPA)¹⁵ in 2005 as a response to the decision of the Seventh Session of the Conference of the Parties (COP7) in Marrakech, Morocco. The preparation process has followed the generic guiding principles, approaches, methods and tools outlined in the annotated guideline prepared by LDC Expert Group (LEG). The basic approach to NAPA preparation was aligned with the sustainable development goals and objectives of the country where it has recognised necessity of addressing environmental issue,

development concern and natural resource management with the participation of stakeholders in bargaining over resource use, allocation and distribution. Involvement of different categories of stakeholders was an integral part of the preparation process including assessing impacts, vulnerabilities, and adaptation needs and measures keeping urgency and immediacy principle of the NAPA. Policy-makers of Government, local representatives of the Government (Union Parishad Chairman and Members), scientific community members of the various research institutes, researchers, academicians, teachers (ranging from primary to tertiary levels), lawyers, doctors, ethnic groups, media, NGO and CBO representatives and indigenous women contributed to the development of the NAPA for Bangladesh.

The Bangladesh NAPA has identified fifteen projects as immediate and urgent needs of which a) providing drinking water to coastal communities to combat enhanced salinity due to sea level rise, and b) dissemination of climate change and adaptation information to

vulnerable community for emergency preparedness measures and raising awareness on enhanced climatic disasters, are related to address health concern to climate change. In addition to identification of immediate and urgent measures, one of the important outcomes of the NAPA process itself were awareness creation among the different stakeholders that resulted initiation of several activities including studies and action plan on health issue.

An extensive discussion among the health professional organised by the World Health Organization identified that a) better understanding of the linkages of climate change to health issues in Bangladesh, b) identification of the most direct and serious diseases, and health problems most affected by climate change, c) identification of additional challenges for both short-term and long-term, and d) identification of the major sectors that need to be involved to cope with the stress of climate change related health problems are important task for Bangladesh. Need for pro-active actions and development of strategies to reduce the

Table 1: Immediate and Urgent Adaptation Activities identified in Samoa's NAPA, and their current state of address.

Project Profile Name	Activities	Implementation
Securing Community Water Resource	<ul style="list-style-type: none"> • Develop water purification programmes for communities • Develop watershed management programme • Alternative water storage programmes • Restoration of coastal springs in communities 	Objectives addressed via the Water Sector Support Programme (WSSP 2005-2010) funded by European Union.
Reforestation, Rehabilitation & Community Forestry Fire Prevention	<ul style="list-style-type: none"> • Reforestation & Rehabilitation (sustainable forest management) • Forest Fire Prevention Programme 	
Climate Health Cooperation Programme	<ul style="list-style-type: none"> • Establish Climate-Health Cooperation Programme to institute coordination of climate-health partnership programs and emergency measures to respond to climate change and extreme events 	'Integrating Climate Change Risks in the Agriculture and Health Sectors in Samoa Project: 2008–2012' (ICCRA&HSS) approved and expected to commence implementation in April 2009
Climate Early Warning System	<ul style="list-style-type: none"> • Develop climate early warning system and emergency measures 	GEF LDC funded
Agriculture & Food Security Sustainability	<ul style="list-style-type: none"> • Investment on annual crops and home vegetable farming • Alternative Farming Systems 	
Zoning & Strategic Management Planning	<ul style="list-style-type: none"> • Zoning, disaster planning & urban planning • Strengthening building codes resilient to cyclones 	In project design and specifications stages. Potential funding source: GEF-LDC funding
Sustainable Tourism Adaptation	<ul style="list-style-type: none"> • Sustainable tourism – to develop tourism Environmental Policy 	
Implement Coastal Infrastructure Management Plans for Highly Vulnerable District	<ul style="list-style-type: none"> • Implement coastal zone management • Coastal infrastructure protection (seawall) • Construction of seawalls (subject to existing plans and codes) • Assistance for relocation of roads further inland • Assistance for relocation of communities inland 	To be achieved through funding from Community-Based Adaptation (CBA) Fund (GEF) and the Pacific Adaptation to Climate Change (PAC) fund
Establishing Conservation Programmes in Highly Vulnerable Marine & Terrestrial Areas of Communities	<ul style="list-style-type: none"> • Conservation areas • Establish marine reserves • Marine & terrestrial conservation areas (e.g. MPAs) 	Samoa is one of only 10 developing countries selected to pilot Community Based Adaptation funding

health burden which can be build-on the existing health system by incorporating climate change and its impacts given significant importance. Training of health professionals/health workers to cope with the climate change related impacts and awareness and capacity building that incorporate the government and private sector initiatives together are equally important measure to deal with adverse impacts of climate change on health.

Very recently the Ministry of Environment and Forests, Government of Bangladesh has formulated Bangladesh Climate Change Strategy and Action Plan 2008. This plan has six pillars, one of which is human health and food security. It has already allocated about US\$ 45 million from national budget and agreed to establish a Multi-donor Trust Fund (MTF) to address climate change issues. In the context of climate change and health, the strategy and action plan has highlighted research and monitoring need on the impacts of climate change on disease patterns particularly of malaria, dengue, diarrhoea, and heatstroke. Monitoring of changes in water quality is also important. It has also suggested more work on social and economic costs of disease and development of adaptive measures to deal with adverse impacts.

Maldives

Vulnerability

Maldives is also a small island developing state, as an archipelagic nation of 26 geographic atolls. Over 80% of the land area in the Maldives is less than one metre above mean sea level. Over 97% of these inhabited islands have reported varying degrees of beach erosion out of which 64% are with severe erosion. 42% of the Maldivian population and 47% of the housing structures in the Maldives are within 100 metres of coastline¹⁶. Regular sea swells and flooding are experienced by the Maldivians over the years and during the past 6–8 years around 37 inhabited islands have been flooded regularly, at least once a year with a minimum of once a year flood incidence being experienced by over 90 inhabited islands¹⁶.

The adaptation process

The geographic nature and location of the Maldives make it one of the most vulnerable to the impacts of climate change. National Adaptation Programme of Action (NAPA) is the first broad multisectoral effort undertaken to identify much needed adaptation measures and priority issues that need to be addressed to minimize the negative impacts of climate change¹⁶. The NAPA has been endorsed at the highest level of the government. Formulation of NAPA was initiated and lead by the environment sector with active involvement of experts from several other sectors including health, transport, planning development and fisheries/agriculture. The overall aim in the development of NAPA was achieving a sustainable development by increasing resilience of the systems vulnerable to climate hazards and risks¹⁷.

The guiding principles of developing NAPA in Maldives were transparency, broad stakeholder engagement, partnership building among focal agencies, community participation and ownership by the people of Maldives especially the atoll population, multi-disciplinary analysis and synergy with national development policies. The Maldives NAPA development process could be broadly divided in to three stages. In the first stage experts from various sectors developed technical papers based on available evidence and research and made series of presentations where issues were extensively discussed. This was crucial for experts from different backgrounds to understand the science, available evidences and vulnerabilities of different sectors and gain a better, in-depth knowledge

and understanding of the broad dimensions of the impacts of climate change. In the second phase extensive public consultation was sought from across the country based on which adaptation needs and priorities were identified. The Maldives NAPA development was more of a bottom up approach driven by the community and stakeholders with their full involvement and real concerns of the people are well represented. The third stage was compilation of the deliberations and findings from the various consultative meetings and preparation of the final document.

Maldives NAPA has produced a policy framework for adaptation to climate change in the Maldives keeping in mind the complex interaction of climate hazards and vulnerabilities based on the exposure risk profile. The adaptation policy framework of NAPA has identified the various climate change related risks and hazards to the Maldives, from the available data and knowledge, based on which the most vulnerable systems for the Maldives are identified. It deserves to be noted here that it has given a high importance to the human system and health and well being of the people. Based on expert analysis with community and other stakeholder consultation, adaptation strategies for sustainable development are laid out in synergy with the national development goals. It has also come up with a set of sustainable development outcomes for the Maldives relative to the time of development of the programme of action and the local context. The document also acknowledges various barriers for implementation of the adaptation strategies.

Project profiles were developed for the priority adaptation strategies with a special attention given to remove barriers to long-term adaptation to climate change in the Maldives. Four out of the 20 project profiles were directly targeted to the health sector. These project profiles cover areas of health policy, health infrastructure, research and evidence generation, public awareness, capacity building, prevention of climate sensitive diseases and increasing political commitment. There are also several project profiles with direct and indirect health benefits including waste water and solid waste management, water and food security.

NAPA exercise was perhaps the largest initiative of multisectoral stakeholder involvement process in the area of environment and climate change. It also was an eye-opener on the complex links and extent of the association of the environmental and climate change on human health and food and water security, initiating a process of changing the traditional view in the Maldives that climate change is an 'environment' issue that has to be dealt by the environmentalists.

However, after two years of the development of NAPA, not much have been done in terms implementation of the project profiles developed in it and translation of adaptation strategies into practice. There are multiple reasons and challenges behind this slow progress. Perhaps the most significant is failure to develop capacity and retain already scarce trained personnel. Financial constraints remain a major factor for not been able to implement any of the proposed projects. Though the prioritized adaptation strategies and the project profiles have been developed based on extensive and broad stakeholder consultation and reflects real concerns and felt-needs of the people, it has not been able to attract donor funding for various reasons. Ownership by non-environment sectors still remains poor as well, and a notable level of pro-activeness and incorporation of climate change in the sectoral policies and strategies are not seen. However, recent interest of the government on climate change and announcement of making Maldives carbon-neutral within in a decade is promising.

Conclusions

The climate is changing. All countries have a duty to ensure that climate change does not adversely affect the health of their populations. The

development of effective adaptation strategies requires engagement within the health sector and beyond, as described by the country experiences described above. An effective adaptation strategy should include the an assessment of how climate change may affect current public health and disease control strategies.

Much progress has been made in the last few years. Several health-related adaptation projects are either already integrated into ongoing national programmes or have been developed to complement national plans and strategies, mostly through the NAPA process. A range methods and tools are now available to assist with adaptation decision making, particular in those countries which are not supported by the NAPA process.

Improving the evidence base for health impact assessment is also an important step for supporting decision making on climate change. This includes the development of local scientific expertise on climate change and health. WHO has recently review the research priorities to support climate change decision making¹⁸. Information exchange is also important. Thus, there should be mechanisms for lessons learned and information sharing following extreme events.

The evaluation of the effectiveness of interventions has always been part of public health strategies. But it is only recently being recognised that evaluation should be built into the design of adaptation projects, so that it can be shown that so funds are spent equitably, efficiently and effectively in ways that will provide flexibility and are sustainable within development efforts¹⁹. ♦

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