

**Terminal Evaluation of UNDP/WHO GEF Project  
“Piloting Climate Change Adaptation to Protect Human  
Health”**

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## **Acronyms and abbreviations**

ALM	Adaptation Learning Mechanism
APF	Adaptation Policy Frameworks
CDC	(China) Center for Disease Control
DFID	(UK) Department For International Development
GEF	Global Environment Facility
GLOF	Glacier Lake Outburst Flood
HMD	Hydro-Meteorological Disasters
MoH	Ministry of Health
MDG	Millennium Development Goal
SCCF	Special Climate Change Fund
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNITAR	United Nations Institute for Training And Research
VRA	Vulnerability Reduction Assessment
WHO	World Health Organization

## Executive Summary

The *Pilot Program on Climate Change Adaptation to Protect Human Health* was the first full-size project funded by the Special Climate Change Fund that piloted and demonstrated how adaptation can reduce health vulnerability to climate variability and change. This global pilot project was designed to increase the adaptive capacity of national health system institutions, including field practitioners, to prepare for, respond to, and recover from the health risks of climate variability and change. The project covered seven countries: Barbados, Bhutan, China, Fiji, Jordan, Kenya, and Uzbekistan..

The objective of this terminal evaluation was to assess project performance based against expectations set out in the Project Logical Framework, covering the criteria relevance, effectiveness, efficiency, sustainability, and impact. The focus of the terminal evaluation was on the project's success in achieving results, paying more attention on the output-level to those activities not covered by the mid-term evaluation in May 2013. The evaluation took into account the GEF evaluation objectives at the project level: (i) promote accountability for achieving GEF objectives; and (ii) promote learning, feedback, and knowledge sharing on results and lessons learned among the GEF and its partners.

The primary concern with climate change continues to be that changing weather patterns will exacerbate the population health burden of the wide range of health outcomes that are sensitive to weather and climate. Examples include injuries, illnesses and deaths associated with extreme weather and climate events; changes in the geographic range, seasonality, and incidence of vector-, water-, and foodborne diseases; increases in ground level ozone and aeroallergens increasing the number of cases and exacerbating current levels of respiratory diseases; and increasing the numbers of undernourished children. These climate-sensitive health outcomes are current problems for health systems, particularly in low- and middle-income countries, with a wide variety of strategies, policies, and programs to reduce their impact on health. While the health sector has long experience with these policies and programs, there is limited knowledge of and experience with incorporating concerns about a changing climate into ongoing or proposed programs and projects. This is particularly true in low-income countries with limited human and financial resources to reduce preventable injuries, illnesses, and deaths from climate-sensitive health outcomes.

The seven participating countries were purposely chosen to maximize the opportunities for learning internationally relevant lessons to increase the capacity of national health systems. The selection process identified countries that exhibited evidence of significant population health vulnerability to climate change; heightened awareness of health risks from climate change; strong commitment of national agencies and WHO and UNDP country offices; and at least basic national capacity to respond. Collectively, countries were selected to reflect a broad range of different kinds of health vulnerability to climate change and a wide geographical coverage. The selected countries were grouped into:

- Small island states with high proportions of their populations living on coastlines (Fiji and Barbados);
- Arid and semi-arid regions (Jordan and Uzbekistan);
- Mountain regions (Bhutan, Kenya); and
- Rapidly developing and urbanizing populations (China)

Specific issues within each country were selected at the initiation of the project through the vulnerability review and stakeholder consultation process:

- Water-stress in Barbados;
- Flooding (glacial outbursts), water- and vectorborne diseases in Bhutan;
- Heat-related cardiovascular diseases in China;
- Floods and drought in Fiji;
- Water quality and water quantity in Jordan;
- Changing transmission intensity and distribution of malaria in the highlands of Kenya; and
- Intestinal, cardiovascular and respiratory diseases associated with heat stress and water-stress in Uzbekistan.

The project outcomes were common across all countries, with country-specific outputs adapted from the global outputs to address the local conditions and constraints:

- Outcome 1: an early warning and response system established with timely information on likely incidence of climate-sensitive health risks in the participating countries;
- Outcome 2: Capacity of health sector institutions improved to respond to climate-sensitive health risks based on early warning information;
- Outcome 3: disease prevention measures piloted in areas of heightened health risk due to climate change; and
- Outcome 4: cooperation promoted among participating countries on innovative adaptation centric strategies, policies, and measures.

Outcomes 1 and 2 were mainly concerned with data sharing and analysis, definition of operational roles, and development of training and public information. The system boundaries in these cases were the entire country. Outcome 3 was implemented nationally in the smaller countries (Barbados, Bhutan, Fiji), and at subnational level in two or three specific locations in the remaining countries. Outcome 4 was implemented globally. The project implemented new and modified existing strategies, policies, and measures to increase the coping range of human societies in response to climate-sensitive diseases. The project supported interventions to ensure that the participating countries had measurable increases in their capacity to adapt and reduce health impacts of climate change. Thus, it involved national action to build systemic and institutional capacity to support health adaptation to climate change, as well as demonstrating adaptation measures on the ground. The project also promoted learning within each project country as well as across countries, and linked to the UNDP's Adaptation Learning mechanism portal.

At the level of the project objective, the indicator used the Vulnerability Reduction Assessment (VRA) method to measure the changing perceptions of health decision-makers of the vulnerability of the health sector to climate change. The four outcome indicators are firmly rooted in activities routinely undertaken by Ministries of Health, such as monitoring and evaluation for malaria control programs, but expanding them to incorporate risks associated with climate variability and change. As a result, the indicators are appropriate to the outcomes and outputs and are indicators that can be modified as appropriate to further adaptation activities by the participating countries.

This first global project to pilot climate change adaptation to protect human health was highly successful, with excellent examples of best practice in several aspects, including multi-UN agency cooperation and collaboration, capacity building, and mainstreaming. The design was well thought through, providing a range of lessons learned that will be helpful for other countries as they start conducting the health component of their national adaptation plans. The effectiveness of the project is evident in the results achieved and the capacities created in the health sector to begin addressing the risks of climate change. The national projects also showed the value of transferring knowledge and tools to the full range of health system actors, the general public, and decision- and policy-makers. The project clearly demonstrated that health protection to manage the health risks of climate change could be effectively mainstreamed into national health policies and plans.

The table provides the project rating:

<b>Rating Project Performance</b>		
	<b>Rating</b>	<b>Comments</b>
<b>Overall Project Results</b>	HS	The project produced significant results to meet the objective, making a highly valuable contribution to increasing the resilience of health systems in Barbados, Bhutan, China, Fiji, Jordan, Kenya, and Uzbekistan. In addition, the national and international capacity built and the lessons learned provide a solid basis for other low- and middle-income countries as they begin health adaptation planning. The guidance documents and other tools developed will prove helpful to other countries and to other sectors.
<b>Project Outcomes</b>		
<i>Overall quality of project outcomes</i>	HS	As the first project to address health adaptation in low- and middle-income countries, the outcomes accurately reflected where countries needed to



		start with building capacity and implementing options to address their risks from climate variability. Further, the outcomes are relevant to other countries as they begin addressing their vulnerabilities to climate change, so the results of this project will be very helpful to future health adaptation projects.
<i>Relevance</i>	HS	The modified outcomes were highly relevant to the international and national needs for managing the health risks of climate variability and change. The project delay meant modifications of the originally proposed outcomes were needed for several countries. The flexibility and commitment of the countries to using project funds efficiently and effectively meant the outcomes were relevant to the country needs.
<i>Effectiveness</i>	S	There was a strong commitment by all countries to ensuring the project achieved its expected outcomes. Effectiveness varied somewhat across the projects, but all made satisfactory progress in building health system resilience to climate variability.
<i>Efficiency</i>	S	As would be expected with a seven-country project with a wide diversity in initial capacity on climate change and health, countries progressed at different rates. The rate of progress was determined not only by the capacity built to manage the health risks of climate change, but also by national contexts and processes that were generally outside the control of the project team. The countries made good progress even in the face of a variety of constraints.
<b>Sustainability</b>	HS	There is evidence that the capacity built and the national and regional processes established will ensure continued national priorities for

		incorporating climate change and health into ministry of health policies and plans, and into national adaptation plans.
<b>Implementation</b>		
Overall Quality of Project Implementation/Execution	HS	Project implementation and execution were complex, yet were effectively managed by WHO and UNDP. The agencies combined their strengths and provide a best practice example of across UN cooperation.
<b>Monitoring and Evaluation</b>		
Overall quality of M&E	S	The delay in implementing the VRA meant that only a baseline and final evaluation were possible. It would be helpful for future health adaptation projects to develop other indicators that would be comparable over temporal and spatial scales.

Recommendations include:

- The national projects had significant impact on increasing resilience to selected health risks of climate variability and change. The capacity built means the follow-up to the projects could provide more comprehensive impact across the range of risks the countries are facing.
- Future projects would benefit from investing sufficient time into project formulation, to ensure that country ownership, an enabling environment, stakeholder engagement, and other conditions that facilitate project success are maximized. Strengthening cooperation between the health sector and meteorological services in the access and use of climate and health data should be part of the process of project formulation.
- UNDP and WHO headquarters were extremely effective partners; continuing that partnership would be beneficial for future projects. Engaging UNDP and WHO headquarters and the regional and country offices in national projects would be effective in supporting implementation, capacity building, sharing lessons learned, and project management. It would be helpful to develop guidance on monitoring and evaluation systems for health adaptation projects that could be customized to country needs, while having a consistency that would facilitate comparisons across countries.
- The mix of capacity building used in the project was highly successful, including training workshops, annual meetings, participation in scientific conferences,

conference calls, electronic information, and selected visits by WHO headquarters and regional staff. It would be helpful for future projects to have sufficient funding for (1) targeted training courses, such as training on analyzing weather and climate data, or on developing and deploying early warning systems; and (2) more frequent meetings of project teams, particularly early in the project. Learning curves on health adaptation are fairly steep at the beginning of a project; holding meetings about every six months for the first two years could support more rapid capacity building on project implementation. Capacity development across the full range of actors from health systems to decision-makers to the general public would be beneficial.

- Future projects should explicitly incorporate consideration of longer-term climate change, building iterative management approaches into policies and plans to ensure resilience as the climate continues to change. It also would be helpful for future project to include a specific output to develop a plan for scaling up.
- Adaptation is a long-term process. To the extent possible, it would be beneficial to support longer-term projects, to ensure sufficient time for implementation and monitoring and evaluation of results.

## 1. Introduction

This report presents the finding of the terminal evaluation of the UNDP/WHO GEF Project *Piloting Climate Change Adaptation to Protect Human Health*. This was the first full-size project funded by the Special Climate Change Fund that piloted and demonstrated how adaptation can reduce health vulnerability to climate variability and change. This global pilot project was designed to increase the adaptive capacity of national health system institutions, including field practitioners, to prepare for, respond to, and recover from the health risks of climate variability and change. The project covered seven countries: Barbados, Bhutan, China, Fiji, Jordan, Kenya, and Uzbekistan.

As such, this pilot project contributed to the broader goal of ensuring that health systems are able to effectively and efficiently manage climate-sensitive health risks. The overall objective is the third of the four global objectives identified under TA3 (Health) in UNDP's global "Monitoring and Evaluation Framework for Adaptation" (2007); Adaptive Capacity: capacity for surveillance of and prevention/response to climate-sensitive diseases improved and/or expanded. The pilot project objective also corresponded to the objectives of the WHO headquarters work plan mandated by Member States at the World Health Assembly in 2008, specifically under objective (1): engage in partnerships with other United Nations Organizations and sectors other than the health sector at national, regional, and international levels, to ensure that health protection and health promotion are central to climate change adaptation and mitigation policies; and objective (4): strengthen health systems to cope with the health threats posed by climate change, including emergencies related to extreme weather events and sea level rise.

### 1.1 Purpose of the evaluation

The objective of this terminal evaluation, as described in the Terms of Reference (Annex A), is to assess project performance based against expectations set out in the retrofitted Project Logical Framework, which provides performance and impact indicators for project implementation along with their corresponding means of verification. The evaluation covers the criteria of:

- Relevance, including how the project related to environment and development priorities at the local and national levels, and how the project linked with similar projects.
- Effectiveness, including the extent to which the expected outcomes and objectives of the project achieved.
- Efficiency, including implementation and administrative processes.
- Sustainability, including the prospects of sustaining the program's effects and benefits in the near future.
- Impact, including indications that the project contributed to, or enabled progress toward, reduced community and ecosystems vulnerability and/or improved ecological status of ecosystems and livelihoods status of communities.

## **1.2 Scope and methods**

The focus of the terminal evaluation was on the project's success in achieving results, paying more attention on the output level to those activities not covered by the mid-term evaluation in May 2013 (i.e. more detail in evaluation of progress since May 2013, including follow-up actions to the recommendations in the mid-term evaluation). Lessons learned and recommendations were formulated to help improve future programming on health adaptation through the GEF, UNDP, or WHO. The methods were designed to provide evidence-based information that is credible, reliable and useful, following a participatory and consultative approach.

The evaluation was conducted in accordance with the *GEF Monitoring and Evaluation Policy* and with the *UNDP-GEF Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed projects*. The evaluation took into account the GEF evaluation objectives at the project level: (i) promote accountability for achieving GEF objectives; and (ii) promote learning, feedback, and knowledge sharing on results and lessons learned amongst the GEF and its partners.

*Evaluation matrix:* The evaluation matrix included in the terms of reference was slightly modified (Annex B) to inform the document review and evaluation, and for conducting interviews.

*Document review:* Annex C lists the documents evaluated.

*Interviews:* The stakeholders interviewed are listed in Annex C. The interviews were based on the evaluation matrix, asking the participants for their perspectives on each item. Interviews were conducted via Skype over the period 1 – 11 February 2015. At the country level, focus group interviews were held with members of the project team and key stakeholders. Because of challenges with time zones, Kenya held a focus group discussion on the evaluation criteria and submitted written responses. Jordan and Uzbekistan submitted additional material after their focus group interviews. Interviews also were held with WHO headquarters and UNDP.

## **1.3 Structure of the evaluation report**

Section 2 described the project and development context. Section 3 presents the results of the evaluation under the headings: 1) project design and formulation (including relevance, formulation, and risks); 2) project implementation (including effectiveness, efficiency, financial management, project management, and monitoring and evaluation); and 3) project results (including achievements, sustainability, mainstreaming, and impacts). Section 4 rates the project performance; Section 5 discussed lessons learned (including implications for scaling-up); and Section 6 presents conclusions and recommendations.

## 2. Project description and development context

The *Pilot Program on Climate Change Adaptation to Protect Human Health* was initiated as awareness was increasing of the magnitude and pattern of current and projected health risks of climate change, but with limited experience in the health sector in the actual design, implementation, monitoring, and evaluation of specific adaptation policies and measures to adapt to these risks.

SCCF funding was used to target the additional activities needed to increase the adaptive capacity to respond to the health risks of climate change, with country co-financing mobilized to enhance the baseline and WHO and other co-financing used to support activities associated with baseline development.

### 2.1 Project history

UNDP and the World Health Organization headquarters collaborated to develop this first global project on public health adaptation to climate change. When the project was funded, UNDP was the Implementing Agency and the World Health Organization headquarters the Executing Agency. WHO headquarters is the worldwide health authority mandated to build the capacity of national public health organizations and institutions, and so was the appropriate institution to facilitate better understanding and management of the local and national health risks of climate change.

The UNDP and WHO collaboration maximized integration of the global project's national activities into national poverty reduction strategies in support of the Millennium Development Goals. Further, this execution modality promoted integration and synergy with existing climate change and health global programs led by WHO headquarters and other development-oriented adaptation projects supported by UNDP; greater national self-reliance through effective use / strengthening of technical expertise of national health institutions through learning by doing; and sustainability of project outcomes through an increased sense of national ownership and commitment to climate change adaptation and development objectives.

WHO provided technical support and guidance to Ministries of Health through their Headquarters office in Geneva, their regional offices, and the WHO country offices. This support and guidance included approaches to mainstreaming the health risks of climate changes into health system policies and measures. Further, WHO country offices often had experience with convening ministries whose activities affect health, including the ministry of health and ministries whose mandates include meteorological services, agriculture, etc. The project was structured to identify and share lessons learned across countries and with other partners.

The project started in January 2010 after a multi-year delay.

## **2.2 Problems the project sought to address**

The primary concern with climate change continues to be that changing weather patterns will exacerbate the population health burden of the wide range of health outcomes that are sensitive to weather and climate. Examples include injuries, illnesses and deaths associated with extreme weather and climate events; changes in the geographic range, seasonality, and incidence of vector-, water-, and foodborne diseases; increases in ground level ozone and aeroallergens increasing the number of cases and exacerbating current levels of respiratory diseases; and increasing the numbers of undernourished children. These climate-sensitive health outcomes are current problems for health systems, particularly in low- and middle-income countries, with a wide variety of strategies, policies, and programs to reduce their impact on health. While the health sector has long experience with these policies and programs, there is limited knowledge of and experience with incorporating concerns about a changing climate into ongoing or proposed programs and projects. This is particularly true in low-income countries with limited human and financial resources to reduce preventable injuries, illnesses, and deaths from climate-sensitive health outcomes.

There are a number of underlying reasons as to why there has been limited progress in identifying and implementing strategies, policies, and measures to protect the health of the vulnerable populations in countries. The reasons are many and often context specific; a few broad themes that emerged during the formulation phase include:

- Relatively recent appreciation of the links between climate change and health;
- Existing health system related policies and practices do not reflect specific response needs for managing climate change-related health impacts;
- The absence of integrating climate change considerations into operational health plans by the public health community; and
- Insufficient intra- and inter-country learning within and between key institutions that matter in addressing climate change health concerns.

The normative situation requires relevant authorities at the national and sub-national level to have great capacity to predict climate change related health impacts, factor climate change risks into health management decision-making processes, test specific management practices, and share lessons learned. In this context, critical barriers that this project sought to overcome included:

- Absence of functional monitoring systems of climate change sensitive health risks;
- Unclear mandates for health ministries and other relevant entities at the national and sub-national level to incorporate climate change related concerns into programming and planning;
- Poorly informed/trained health managers on climate change issues at the district and central level;
- Insufficient investment in testing specific measures to manage climate change-sensitive health risks over short and longer time scales; and

- Extremely limited within- and cross-country learning on managing emerging climate change related health risks.

Specific issues within each country were selected at the initiation of the project through the vulnerability review and stakeholder consultation process outlined in the UNDP's Adaptation Policy Frameworks:

- Water-stress in Barbados;
- Flooding (glacial outbursts), water- and vectorborne diseases in Bhutan;
- Heat-related cardiovascular diseases in China;
- Floods and drought in Fiji;
- Water quality and water quantity in Jordan;
- Changing transmission intensity and distribution of malaria in the highlands of Kenya; and
- Intestinal, cardiovascular and respiratory diseases associated with heat stress and water-stress in Uzbekistan.

In Barbados, increasing temperatures, lengthening periods of drought and increasing sea level rise associated with climate change are likely to increase the risks of climate-sensitive diseases. Intersectoral assessments undertaken during the preparatory phase identified the effects of climate change on fresh water resources as the highest priority threat to health; the key health concerns included outcomes associated with water scarcity and quality. Waterborne diseases, spread of vectorborne diseases such as dengue fever and rodent-borne leptospirosis, and health impacts from extreme weather events, such as hurricanes, and high ambient temperatures were anticipated. Health risks were considered likely through direct climate effects on disease risks, i.e. insufficient supplies of freshwater and increased transmission of waterborne diseases such as salmonella, giardiasis, and amoebic dysentery. They were also considered likely through the secondary effects of policies used to address water stress. Most importantly, use of rainwater catchments and storage facilities to reduce climate change associated stress on groundwater resources were expected to increase the number of potential breeding sites for mosquitoes that carry dengue fever and increase the risks of diseases related to water quality. Barbados has the highest rate of dengue fever in the Americas. Unless properly managed, using treated wastewater as one solution to water scarcity, particularly for agriculture, could also increase transmission of waterborne diseases and contamination with hazardous chemicals.

Bhutan suffers from high rates of climate-sensitive infectious diseases. Projected temperature rise (higher in mountainous areas than elsewhere in the world) was expected to increase the geographic range and incidence of a range of vectorborne diseases, particularly malaria (*Plasmodium falciparum* (30-60% of cases) and *Plasmodium vivax*) and dengue fever. Over 50% of the population resided in malarial areas. Temperature is likely the major limiting factor in the current geographic distribution of malaria. Populations at the altitudinal edge of the malaria distribution were expected to be particularly vulnerable to increasing risk of epidemics as temperature increases. Case



fatality rates could be up to 10-times greater during an epidemic as opposed to stable transmission. Dengue fever continues to be an important emerging infectious disease in Bhutan. The disease was not reported until July 2004, when an epidemic occurred in Phuntsholing. In 2006, 2547, suspected cases of dengue were reported. Dengue is now endemic during the monsoon period.

Diarrheal disease continues to be a major problem affecting childhood survival; these diseases remain one of the top three leading causes of morbidity, causing 10-15% of morbidity. Increases were expected in the geographic range and incidence of diarrheal diseases with increasing temperatures and with increasingly variable precipitation increasing the risks of flash floods that in turn result in the spread of diarrheal and vectorborne disease.

Many cities in China experience severe heatwaves. Extreme hot summers were recorded in 1988, 1990, 1994, 1998, 1999, 2002, 2003, and 2004, resulting in thousands of excess deaths. For example, in 1998, Nanjing suffered from the most severe heatwave in recent decades, with 24 days where the maximum temperature was between 35.C and 37.2.C. The number of deaths increased 2-3 times above what was expected during summer periods. Mortality was particularly high among those 60 years of age and older. At the same time, China has the highest rates of cerebro-cardiovascular and respiratory diseases in the world. Morbidity and mortality rates are 14.3% and 111/100,000 for cerebrovascular disease and 6.6% and 95.8/100,00 for cardiovascular disease. About 45% of deaths are due to cerebro-cardiovascular disease. The health care cost and labor force loss from these diseases is more than US\$2,500 million per year. Heatwaves are increasing in frequency, intensity, and duration. These events will combine with a rapidly ageing population with high levels of CVD, high rates of urbanization (contributing to the urban heat island), and persistent high levels of urban air pollution, to further increase mortality.

Fiji has high baseline vulnerability to a number of climate-sensitive health impacts, including the health impacts of hydro-meteorological disasters such as floods and storms, and vectorborne and waterborne diseases (dengue and diarrhea). Remote areas in Fiji were considered vulnerable to nutrition-related health impacts, particularly during droughts. Projected changes in dengue-fever epidemics were modeled using an integrated assessment model for the Pacific Island countries that assists with assessments of the impact of climate change and sea level rise (PACCLIM). It found that climate change, through increasing temperatures, would lead to increases in the risk of dengue-fever epidemics through increasing the frequency of epidemics, the number of months suitable for epidemic transmission, and thereby the proportion of the population exposed. This could result in dengue becoming endemic, which would increase the number of fatalities. Areas highly vulnerable to dengue fever included Suva and Rewa in the Central Division, Lautoka, Ba, Nadi, Nadroga and Ra in the Western Division, and Macuata in the Northern Division.

Diarrheal diseases remain a leading cause of mortality and morbidity in Fiji, particularly

among younger age groups. Studies using Fijian data showed that elevated temperature and unusually high or unusually low rainfall was associated with a statistically significant increase in diarrhea. Fish poisoning is an important subset of diarrheal disease, and is also associated with climate, with higher incidence in El Nino years. Diarrheal disease may become more common if Fiji becomes warmer and wetter, and if droughts and tropical cyclones occur more frequently, disrupting water supplies and sanitation systems. Areas vulnerable to diarrheal diseases include Suva, Nadi, Ba Lautoka, Ra, and Macuata.

Jordan ranks among the poorest countries in the world in water availability, with a current per capita availability of 75 liters/day, far below the water poverty line and approximately 1/10th that of, for example, any Western European country. Climate change is expected to decrease surface water availability by 20-40% over the next half century, reducing the per capita water share for Jordanians. The Jordanian Ministry of Water and Irrigation has a strategy to guarantee domestic water security by promoting, among other measures, marked increasing use of treated wastewater as a strategic alternative water supply.

The heavy and increasing use of treated wastewater in Jordan occurred in a manner considered to pose potential risks to human health. Unless new adaptive measures were implemented, this change in the water strategy will cause direct and indirect health risks to the population. International and local studies showed that increasing use of wastewater in agriculture, driven partly by climate change, could increase health risks including via the consumption of or exposure to pathogenic microorganisms, heavy metals, or harmful organic chemicals such as endocrine disrupting compounds and pharmaceutically active compounds. Analysis of the available data gave a preliminary indication that areas that make heavy use of wastewater (Deir Alla, South Shauna, Madaba, Jarash, Ramtha, and Balqa) have higher rates of key diseases associated with poor water quality (e.g. diarrhea and nematode worms) than the rest of the country.

Initial scoping of the current impact and climate-sensitivity of health issues in Kenya highlighted three priorities: (i) malaria in highland areas, (ii) water-scarcity and diarrheal disease, and (iii) health impacts of acute drought and floods. The cross-sectoral scoping group decided to focus on malaria because approximately 20 million people (70% of the population) are at risk of malaria, the clear evidence of sensitivity to climate variability, strengthening evidence of the effects of climate change, and the existence of strong intervention programs that could be modified to better manage the risks. In areas where disease transmission occurred throughout the year, about 25% of all outpatient attendance and over 40% of hospital admissions in children under the age of five were malaria related. 6,000 pregnant women suffered from malaria-associated anemia annually and about 4,000 babies were born with low birth weight as a result of maternal anemia. About 3.5 million Kenyan children below the age of five are infected annually, resulting in 145,000 hospital admissions and an estimated 34,000 deaths due to illnesses related to malaria; about 93 deaths daily. While communities living at low altitudes are more vulnerable to stable malaria transmission, those above 1,100 meters are more vulnerable to malaria epidemics. When conditions were suitable for transmission, the low level of

immunity within the population means the disease spreads rapidly and tends to cause more severe illness.

In Uzbekistan, reviews and data analyses conducted during the preparatory phase showed strong evidence that climate-sensitive diseases exert a large health toll. The major concerns identified were the high and increasing burden of cardiovascular disease, persistent high levels of diarrheal disease, respiratory illness, and health effects from dust storms. Each of these also showed high sensitivity to climate variability. For example, the burden of diarrheal disease was high, ranking 6th out of the 53 WHO-European region states in terms of per capita morbidity, with approximately 500 deaths and 38,000 years of healthy life lost each year. Diarrhea cases are many times higher in the summer than winter months, and preliminary unadjusted analyses of the seasonal pattern indicates that cases increase by 10-13% increase for every one degree centigrade increase in temperature. Diarrhea also is highly sensitive to the availability of water.

### **2.3 Project objectives**

The objective of the project was to increase the adaptive capacity of national health system institutions, including field practitioners, to respond to climate-sensitive health risks. It was anticipated that this would contribute to the broader goal of ensuring that health systems were able to manage health risks resulting from climate variability and change. The project objective corresponded to UNDP and WHO objectives, and was designed to contribute to several MDG Goals and Targets, including:

- MDG Goal 4: Reduce by two thirds, between 1990 and 2015, the under-five mortality rate;
- MDG Goal 5: Reduce, by three quarters, between 1990 and 2015, the maternal mortality rate;
- MDG Goal 6, Target 7: Have halted by 2015, and begun to reverse, the incidence of malaria and other diseases.

The project included four outcomes at the global level. The APF-guided project design process in each country identified country-specific interventions needed to deliver the global outcomes within each country. Therefore, while the outcomes were common across all countries, the global outputs were indicative – country-specific outputs adapted the global outputs to address the local conditions and constraints.

- Outcome 1: an early warning and response system established with timely information on likely incidence of climate-sensitive health risks in the participating countries;
- Outcome 2: Capacity of health sector institutions improved to respond to climate-sensitive health risks based on early warning information;
- Outcome 3: disease prevention measures piloted in areas of heightened health risk due to climate change; and
- Outcome 4: cooperation promoted among participating countries on innovative adaptation centric strategies, policies, and measures.

Outcomes 1 and 2 were mainly concerned with data sharing and analysis, definition of operational roles, and development of training and public information. The system boundaries in these cases were the entire country. Outcome 3 was implemented nationally in the smaller countries (Barbados, Bhutan, Fiji), and at subnational level in two or three specific locations in the remaining countries. Outcome 4 was implemented globally.

Based on the baseline assessments undertaken in each country, the project implemented new and modified existing strategies, policies, and measures to increase the coping range of human societies in response to climate-sensitive diseases. The project supported interventions to ensure that the participating countries had measurable increases in their capacity to adapt and reduce health impacts of climate change. Thus, it involved national action to build systemic and institutional capacity to support health adaptation to climate change, as well as demonstrating adaptation measures on the ground. The project also promoted learning within each project country as well as across countries, and linked to the GEF's ALM and UNDP Teamworks mechanism.

The following table shows the GEF-funded elements for Outcomes 1-3 for each country.

	Outcome 1	Outcome 2	Outcome 3
Barbados	Analysis of the relationship between meteorological variables and incidence of water-related diseases and dengue to develop an early warning system, with flexibility to update as climate change and other trends alter relationships. Establishment of communication mechanisms for advance warning and definition of operational procedures for health sector response to contaminated water, and to dengue outbreaks.	Adaptation of global guidelines to define national standards and enforcement practice for safe use of wastewater, and response to warnings of elevated health risks.  Revision of guidance to ensure that household water storage practices in response to climate change and vector control actions do not conflict.  Training and support of health sector personnel for temporal and spatial targeting of vector control interventions in response to early warnings.	Implementation of community based public health education campaigns on safe-use of wastewater and on dengue vector control, targeted on periods of high climatic risk. Monitoring and evaluation of the effectiveness in reducing risks of water-related diseases, including severity of dengue outbreaks.
Bhutan	Mechanism to provide glacier lake outburst	Definition of health working group within	Implementation of interventions for

	<p>flood (GLOF) early warnings to emergency health services, with operating procedures for health sector response.</p> <p>Establishment of a prediction system for climate sensitive infectious diseases, covering seasonal variation, and increase and spread in transmission with climate change.</p>	<p>existing inter-sectoral coordination mechanism for adaptation to climate change.</p> <p>Training and support for district level health managers, and review of intervention plans, to incorporate temporal and spatial targeting of health interventions for climate-sensitive diseases.</p>	<p>epidemic control in response to GLOFs and other climate-related natural disasters.</p> <p>Scale up and targeting of community level interventions for control of water- and vectorborne disease, for times of peak incidence, and monitoring of effectiveness in reducing summer disease peaks.</p>
China	<p>Development of over-arching coordination mechanism to link meteorological and health monitoring data. Development of algorithms for correlation of meteorological and health data, providing advance warning of health risks from heatwaves, with flexibility to update as climate change and other trends alter relationships.</p>	<p>Development and support of coordination mechanism, and development of operational procedures for meteorological and health sectors during heatwaves. Development and support of training for emergency medical treatment during heatwaves.</p>	<p>Implementation of heat-health warning systems in 3 pilot cities, monitoring of effectiveness in decreasing heat-related mortality.</p>
Fiji	<p>Development and implementation of Health Information System covering hydro-meteorological disasters (HMDs) and climate-sensitive diseases, integrated between meteorological and health agencies. Development of</p>	<p>Development and support for a coordination mechanism for climate change and health action. Development of health action plans, incorporation of HMD response plans into Health Ministry and</p>	<p>Implementation of Early Warning and Response system developed, with monitoring of effectiveness in minimizing immediate and secondary (e.g. disease outbreak) health impacts of HMDs.</p>

	operational procedures to manage psychosocial impacts of HMDs.	National Disaster Management Office. Revision of Environmental Health Impact Assessment process to support disaster risk reduction.	
Jordan	Development of integrated system for monitoring water and food contamination, linked to disease monitoring. Development of operational procedures for rapid response when elevated health risks from wastewater are detected.	Development of a coordinated legislative framework to minimize health risks from increased wastewater re-use, with defined institutional responsibilities, coordinated by the inter-sectoral board. Revision and updating of framework and monitoring standards based on project and international experience.	Adaptation of the WHO guidelines on safe wastewater practices for the national context, implementation of the health protection measures in 3 pilot sites, with monitoring and evaluation of impact on water-related diseases.
Kenya	Development of simple algorithms for correlation of meteorological and malaria data, suitable for use by district level health officers. Integration within existing operational guidelines to form a decision support system for response to malaria epidemics, and expansion to areas newly at risk due to climate change. Development of a protocol for updating prediction algorithms as climate and other drivers change.	Training and support for district health officers in the use of decision support system, including meteorological data, to increase malaria control effectiveness and address elevated transmission and spread driven by climate change.	Increased coverage of community level malaria control interventions within 3 pilot districts at increased risk of malaria epidemics, within high-risk periods identified by the warning system. Monitoring and evaluation of increased coverage and targeting of interventions, and reduction in malaria mortality and morbidity during epidemics.
Uzbekistan	Development and	Health sector training	Implementation of

	implementation of protocols to link and correlate health and meteorological data. Development of protocols for operational response by the health sector, and for dissemination of public health warnings, in response to elevated health risks. Development of a protocol for updating prediction algorithms as climate and other drivers change.	on the linkages between climate variability and change and climate sensitive diseases, and increasing control effectiveness through spatial and temporal targeting of interventions. Development of public health information campaign for diseases predicted to increase with climate change.	interventions of known effectiveness (heat advisories, health education campaigns), timed for periods of increased climatic risks, within 3 provinces. Monitoring and evaluation of intervention coverage, and effectiveness in reducing summer peaks of one indicator disease (diarrhea).
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## 2.4 Main stakeholders

World Health Organization headquarters was the Executing Agency for this project. At the national level, each country had a national project steering committee composed of at least representatives of the Ministry of Health and the Ministry of the Environment. National level stakeholders differed across the countries, as listed in the following tables from the Project Document.

Barbados:

<i><b>Organization</b></i>	<i><b>Role in project</b></i>
Ministry of Health	Implementation and coordination of the project
Pan American Health Organization	Technical support and monitoring and evaluation
Ministry of Environment	Implementation and coordination of the project
Barbados Water Authority	Key partner in project; involved in pilot project activities
Meteorological Office	Provision of data for the project
Ministry of Economic Affairs	Provision of support for the project
Ministry of Public Works	Provision of expertise, data, and technical support
University of West Indies	Technical support, provision of expertise
Ministry of Tourism	Provision of data
Ministry of Agriculture	Provision of data
UNDP	Programmatic support and monitoring and evaluation

Bhutan:

<b><i>Organization</i></b>	<b><i>Role in project</i></b>
Ministry of Health Health Care Division, DMS Environmental Health, DoPH, PHED, MoH, VDCP, RRU, DoPH Environment Health Program, DoPH, HRD, HRM	National executing agency; coordinates project
Ministry of Finance, DADM	Funds coordination and monitoring fund utilization
Ministry of Home and Cultural Affairs, Department of Local Governance (DLG)	Coordination of disaster management, training capacity
Ministry of Education	Awareness and training
National Environment Commission (NEC)	Key partner for policy development and enforcement
Royal Society for the Protection of Nature (RSPN)	Awareness and training
UNDP Country Office	GEF Implementing Agency; programmatic support and monitoring and evaluation
WHO Country Office	Technical support and monitoring and evaluation

China:

<b><i>Organization</i></b>	<b><i>Role in project</i></b>
Ministry of Health	Key role in policy development and enforcement
China Center for Disease Control and Prevention	Key role in the organization, implementation, and assessment of the project
WHO	Technical support and monitoring and evaluation
UNDP Focal Point	Programmatic support and monitoring and evaluation
National Development Reform Committee	Partner in policy development and enforcement
National Meteorological Bureau	Climate data and observations; key role in early warning system



Ministry of Science and Technology	Government support
Radio Broadcast and Television Bureau	Key role in spreading information and knowledge
National and local newspapers	Key role in spreading information and knowledge
Ministry of Finance	Partner in policy development and enforcement
Local governments, including health, meteorological, education, transportation, and finance departments	Key role in organizing and implementing the adaptive measures in communities
Ministry of Construction	Plan of construction and building
State Environmental Protection Administration	Policies for climate change mitigation
Ministry of Labor and Social Security	Partner in policy implementation
China Red Cross Society	Medical emergency support, awareness, and training
Ministry of Civil Affairs	Key partner in policy implementation
China Charity Society	Partner in emergency response
Ministry of Education	Key role in health promotion
Ministry of Transportation	Partner in emergency response

Fiji:

<b><i>Organization</i></b>	<b><i>Role in project</i></b>
Ministry of Health	National executing agency
Department of Environment	Key partner for policy development and enforcement
Meteorological Service	Climate data and observations, key role in early warning system
Disaster Management Office	Coordination of disaster management, training capacity
Ministry of Works (Water and Sewerage)	Technical expertise in water management
University of the South Pacific	Provide expertise and research capacity, especially in Integrated Coastal Management, climate change, and tourism
SOPAC	Provide expertise in disaster management, mapping, water supply
WWF South Pacific	Awareness raising, expertise in marine biodiversity

SPREP	Regional communication and coordination
Ministries for Agriculture (Land Use)	Wider land use planning
International Federation of Red Cross and Crescent Societies	Expert opinion in advocacy and awareness
Fiji Red Cross Society	Awareness and training
Department of Town and Country Planning	Policy development and enforcement

Jordan:

<b><i>Organization</i></b>	<b><i>Role in project</i></b>
Ministry of Health (MoH)	National executing agency
Ministry of Water and Irrigation (MWI)	Key partner for policy development and enforcement
Jordan University of Science and Technology	Technical input on scientific assessment of health risks and response effectiveness
Ministry of Agriculture (MOA)	Monitoring of contamination in food
Meteorological Department	Climate data and observations, key role in early warning system
Ministry of Planning (MOPIC)	Planning and financing infrastructure, ensuring coherence with GEF procedures and portfolio at national level
Royal Jordanian Geographical Center (RJGC)	Mapping of water quality and quantity
Royal Scientific Society (RSS)	Role in water quality monitoring
Jordan Environment Society (JES)	Role in water quality monitoring, capacity building for monitoring water quality and quantity
Jordan Society for Sustainable Development	Capacity building for water conservation
Higher Council for Science and Technology (HCST)	Capacity building, supporting translation of project outcomes into policy
Agricultural Engineers Association	Capacity building for safe water use
Greater Amman Municipality (GAM)	Enforcement of local legislation on safe water use
WHO Centre for	Technical guidance and review to ensure effectiveness in

Environmental Health Activities	health protection, linkage with MoH, technical monitoring and evaluation
UNDP Jordan country office	GEF implementing agency; programmatic oversight for project implementation

Kenya:

<b><i>Organization</i></b>	<b><i>Role in project</i></b>
Ministry of Health	Provide public health staff operational expertise at national and district levels for project implementation. Provide liaison with National Disaster Operations Centre and others in financial facilitating identification, preparation, and response to highland malaria epidemics
WHO Kenya country office	Provide overall WHO technical linkage with MoH in project management
Population Service International (PSI) Kenya country office	Promote social marketing of insecticide-treated bednets to the target communities within the Kenyan highlands
Ministry of Environment	Local focal point for UNFCCC; provide and guide compliance to UNFCCC project implementation guidelines
MoI / Kenyatta University	Provide overall insights into reshaping of the National HMIS focus on utility of data for decision-making with the project cycle. Provide overall insights into national policy review in relation to climate-sensitive health risks related to malaria. Provide overall insights into behavioral change communication principles for operation adoption in the project
UNDP	Provide performance feedback from scheduled reports as part of project monitoring efforts to ensure successful implementation
Kenya Meteorological Department	Provide climate-sensitive health risk data (temperature, humidity, and rainfall) for ultimate correlation matrix development within the project
IGAD Center on Climate Outlook	Provide wider picture of the weather outlook in the Great Horn of Africa for possible triangulation with Kenya Meteorological Department data

Uzbekistan:

<b><i>Organization</i></b>	<b><i>Role in project</i></b>
Ministry of Health	Project coordination. The Ministry of Health is keen to improve the capacity of its personnel to prevent and mitigate negative health implications of climate variability and change. It was responsible for delivering outputs to all

	project activities related to capacity building for health care personnel and the local population.
Department of Sanitary Inspectors	Monitoring the sanitary-epidemiological state of the environment. Monitoring the rate of infectious morbidity of the population, elaboration and implementation of prophylactic measures, working with the population.
Health Institute	Monitoring the rate of noninfectious morbidity of the population. Training of population and health care personnel.
Center of Hydro-Meteorological Service at the Cabinet of Ministers of Uzbekistan (Uzhydromet)	Informing of a warning about any possible manifestations of climate variability and change that have potentially detrimental effects on human health. Interaction with other sectors on climate and climate change issues. Active involvement in the design, development, and operation of the early warning and response system established within the project.
State Committee of the Republic of Uzbekistan for Nature Protection (Goskompriroda)	Estimating influences and consequences of global and regional climate change on the environment and population health in Uzbekistan (in particular in Syr-Darya and Tashkent areas). Developing a set of actions for reduction anthropogenic influence on the environment.
Ministry of Emergency	Implementing communication in case of natural disasters

## 2.5 Expected results

The project was expected to improve knowledge and understanding of the health risks of climate change, which would result in relevant authorities at national and sub-national levels having better capacity to project the health risks of climate change, factor climate change risks in health management decision-making processes, test specific management practices, and share lessons learned.

The table lists the baseline for each outcome, the targets at the end of the project, and the source of verification.

	<i>Baseline</i>	<i>Targets End of project</i>	<i>Source of verification</i>
Objective: to increase adaptive capacity of national health system institutions, including field practitioners, to respond to climate-	VRA scores, averaged over all countries = X	By the end of the project, VRA scores averaged over all countries = 0.7X and in no single country is the score higher than 0.85X	Surveys of health sector personnel

sensitive health risks			
Outcome 1: an early warning system provides reliable information on likely incidence of climate-sensitive health risks	<p>Correlation coefficient from historical data:  <math>p(x,y) = \text{baseline}</math></p> <p>X% of health care facilities currently report on a weekly basis</p> <p>Climate data currently available within 1 week for X% of sites</p>	<p>Correlation coefficient for the last three years of project implementation:  <math>p(x,y) = 1.3(\text{baseline})</math></p> <p>By the end of the project at least 90% of health care facilities report on weekly basis</p> <p>By the end of the project climate data available for all districts</p>	<p>Historical and current statistics of climate-sensitive health problems and climatic data</p> <p>Ministry of Health records</p> <p>Weekly weather reports for early warning sentinel sites or from satellite data</p>
Outcome 2: health sector institutions have the capacity to respond to climate-sensitive health risks based on early warning information	<p>X% of district health managers consider their response plan enables them to initiate effective responses</p> <p>X% of district health managers consider that inter-agency and inter-sectoral barriers constrain the delivery of effective responses</p>	<p>By the end of the project, at least 90% of district health managers consider their response plan enables them to initiate effective responses.</p> <p>By the end of the project, at least 90% of district health managers consider that inter-agency and inter-sectoral barriers are not important in delivering effective responses</p>	<p>Focus groups, interviews of district health managers, inspection of response plans by MoH and WHO in all districts</p> <p>Focus groups, interviews of district health workers, inspection of response plans by MoH and WHO in all districts.</p>
Outcome 3: disease prevention measures piloted in areas of heightened health risk due to climate change	Over last five years, average of X% of districts implemented planned response within a predefined appropriate response period	<p>By the end of the project, at least 90% of districts implemented planned responses within a predefined response period, defined for each disease outcome at project onset</p> <p>Within six months of the</p>	District level activity reporting to MoH, verified by field visits to all districts, assessed over 5 years

	No response plan in pilot districts	start of the project implementation, response plans were formulated in all pilot districts	Project reports, documented response plans
Outcome 4: cooperation among participating countries promotes innovation in adaptation to climate change including variability	No cross-border learning	By the end of the program, there is at least one example in each country of a strategy or practice that was introduced on the basis of experiences gained in other countries	Survey of MoH officials and national project teams
	No website exists	Within one month of the start of implementation, a publicly accessible website has been created; at the end of the project, a survey of stakeholders in each country reveals that at least 60% used the website regularly	Project reports and survey of stakeholders as part of the final evaluation
	Initial WHO guidance developed without benefit of practical experiences in adaptation to climate change including variability	At the time of project completion, draft documents have been prepared to guide future UNDP and WHO support for intervention on adaptation to climate change including variability	Project reports, interviews with GEF secretariat, UNDP, and WHO personnel

### 3. Evaluation findings

An issue raised in the mid-term review (Annex D) is summarized here: the delay between preparation of the proposal in 2005/2006 and start of the project in January 2010. The preparation of the initial national proposals, as intended, built capacity for project implementation. However, in the intervening years, many of the national consultants and ministry of health staff initially involved moved on to other interests and jobs, partnerships beginning to develop during proposal preparation lost momentum or fell apart, and/or commitments from ministries and organizations necessary for effective implementation refocused on other needs. Further, national priorities and needs shifted over that time. Therefore, re-starting projects was challenging for many countries, requiring identification of new project staff, many of whom had limited experience in climate change. Projects also needed to re-establish links with other ministries and

organizations; determine how to best implement outputs when needs had changed; and other issues. Further, Jordan and Uzbekistan successfully identified funding that meant some of the outcomes and outputs were achieved prior to the start of the project.

### **3.1 Project design and formulation**

Seven countries were selected to participate in the project to maximize the opportunities for learning internationally relevant lessons to increase the capacity of national health systems. The selection process identified countries that exhibited evidence of significant population health vulnerability to climate change (from national communications or regional or global assessments); heightened awareness of health risks from climate change (based on feedback from national delegates in regional workshops and other WHO capacity building activities); strong commitment of national agencies and WHO and UNDP country offices (as evidenced by communication from national ministries of health and GEF operational focal points); and at least basic national capacity to respond (i.e. excluding countries where other constraints, such as conflicts, would excessively hamper execution of the pilot phase and learning of lessons). Collectively, countries were selected to reflect a broad range of different kinds of health vulnerability to climate change and a wide geographical coverage.

A structured process was followed to identify the countries. First, WHO headquarters defined three categories of populations representing a range of health vulnerabilities highlighted by the international literature: small island developing states, arid regions, and mountain regions. Second, WHO headquarters consulted with the environmental health focal points in each of its six regional offices, asking them to propose one to two countries in their region that met the individual selection criteria. From these, WHO headquarters selected an initial list of 6 candidate countries (Barbados, Bhutan, China, Fiji, Jordan, and Uzbekistan). Third, WHO headquarters consulted with UNDP/GEF and UNDP regional offices, to confirm the proposed countries were consistent with the programming priorities of UNDP. Discussions during this process highlighted the need to include at least one African country and to include rapidly developing economies. Kenya was therefore added to the list as including highland populations, and the focus of the work in China was changed from highland regions to climate-related health vulnerabilities associated with rapid urbanization and economic development.

Thus, the selected countries were grouped into:

- Small island states with high proportions of their populations living on coastlines (Fiji and Barbados);
- Arid and semi-arid regions (Jordan and Uzbekistan);
- Mountain regions (Bhutan, Kenya); and
- Rapidly developing and urbanizing populations (China)

When the project was designed, there was very limited experience with adaptation in the health sector. The project was designed to not only facilitate adaptation in the seven participating countries but also to learn lessons that could be transferred to other

countries as they begin conducting the health component of national adaptation plans. The extensive time invested into the design, including country selection, was clearly valuable for ensuring effective project formulation and for facilitating implementation. The countries presented an appropriate range of health risks of climate change (heatwaves, vectorborne diseases, waterborne diseases).

As discussed in the mid-term evaluation (Annex D), the project formulation perhaps underestimated the training needs of the countries and the extent to which external help (e.g. support external to the national project teams, including support from WHO headquarters and regional office staff and from consultants) would be valuable for capacity building and implementation. Limited budgets for this support meant most countries expressed a desire for more personal support and training in the mid-term evaluation.

### ***3.1.1 Response to the recommendations from the mid-term evaluation***

The recommendations from the mid-term evaluation (Annex D) were:

- A one-year no-cost extension will be critical to allow some countries to complete their Outcomes and Outputs. Several countries would benefit significantly from having another year given the challenges with getting the national projects up and running. Without this extension, there is a very serious risk that projects will not be completed, undermining sustainability of the adaptation achieved.
- Greater flexibility on budget allocation across Outcomes is important to provide further financial support for activities requiring more resources than initially expected. No additional funding would be required to successfully complete the Outcomes and Outputs, although some countries may need to find funding to support the project manager for another year if an extension is granted.
  - Budget allocations should include greater flexibility in the amount of funds that can be used for project management. The limited funding for project management means that in most countries the project manager spends time on procurement and other administrative tasks, significantly reducing the time available for managing technical issues.
- Additional technical support and access to technical skills could enhance national capacity, supporting sustainability of the Outcomes/Outputs. A challenge in the health sector is the low international capacity for designing, implementing, and monitoring adaptation. Additional technical support and access to technical skills would be helpful for building that capacity. Nearly all countries expressed an interest in participation in international short courses, to enhance their understanding of the breadth and depth of issues associated with managing the health risks of climate change. A telling comment from a medical institute in Tashkent was their very high interest in incorporating climate change into medical curriculum, but they did not know who could teach them.
- Consider providing software to translate documents into native languages. Official translations take time and are expensive. Software packages could



- provide translations of sufficient quality for technical use (although this should be verified).
- To the extent possible within technical and financial realities, it would be helpful to collect data on finer than 10-day intervals to improve the precision and accuracy of early warning systems.
- Revise Outcomes and Outputs to ensure they are within the context of an iterative management approach to managing health risks as they continue to change with climate change and development.

In response to these recommendations, the project was granted a one-year no-cost extension. The countries maintained their level of funding for project management. In response to the request for further technical support, a five-day workshop on climate and health data analysis for early warning systems was held in Nairobi, Kenya in May 2014. Given the advanced state of the projects at the mid-term evaluation, the other recommendations were noted for future health adaptation projects.

### **3.1.2 Project indicators**

The terminal evaluation reviewed the project conceptualization as summarized in its strategic results framework, including the expected results and the indicators, the baseline, targets set, and their sources of verification.

At the level of the project objective, the indicator used the Vulnerability Reduction Assessment (VRA) method to measure the changing perceptions of health decision-makers of the vulnerability of the health sector to climate change. It directly asks if activities are correctly targeted. The VRA is a semi-structured and context approach method, designed to enable aggregation of results across projects, to assess overall programmatic impact. This approach has the advantage of being comparable across different regions and contexts, making it possible to determine the extent to which a project was successful in reducing climate change risks. It compliments quantitative indicators used to measure the success of the national project outcomes. The VRA is a composite of four indicator questions, tailored to capture locally relevant issues, that is posed to focus groups. Questions are answered on a scale of 1 to 5, where 1 is very bad and 5 is very good, generating a numerical score that can be compared over time to measure not just whether a project was successful, but whether the project outputs directly contributed towards the objective and outcomes the project sought to achieve. The VRA indicator and example question used for this project were:

	VRA Indicator	VRA Question (examples for drought)
Assessing current vulnerability	1. Vulnerability of health and health systems to existing climate change and/or climate variability	The facilitator raised a question related to the current climate-related risk. Example: What happens when there is drought/floods/heatwave? How does this affect the health of your community?

Assessing future climate risks	2. Vulnerability of health and health risks to developing climate change risks	The facilitator tries to measure health-decision makers' perception of future climate health risks. Example: What would happen if drought/rains/heatwaves were twice as frequent? How would this affect the health of your community?
Formulating an adaptation strategy	3. Magnitude of barriers (institutional, policy, technological, financial, etc.) including inter-agency and inter-sectoral barriers to health system's adaptation / i.e. health protection	Example: What stands in the way of health system adapting to increasing drought/floods/heatwaves? What means do you, in coordination with other agencies and sectors, have to manage events occurring more frequently?
Continuing the adaptation process	4. Capacity and willingness of the health system to continue to manage climate change risks	Example: Rate your confidence that your response plan enables you to initiate effective responses that will continue after the project period.

The indicators for the outcomes are listed in the table.

	<i>Indicators</i>
Objective: to increase adaptive capacity of national health system institutions, including field practitioners, to respond to climate-sensitive health risks	Capacity to respond to climate-sensitive health risks, based on changes in the Vulnerability Reduction Assessment as determined by health sector personnel
Outcome 1: an early warning system provides reliable information on likely incidence of climate-sensitive health risks	Correlation of predictions with subsequent incidences of climate-sensitive health risks Proportion of health care facilities in districts X, Y, Z reporting climate-sensitive health risk data on a weekly basis Proportion of sites for which relative meteorological information is available within one week
Outcome 2: health sector institutions have the capacity to respond to climate-sensitive health risks based on early warning information	Proportion of district health managers who consider their response plan based on the relationship between climate and climate-sensitive health risk early warning enables them

	<p>to initiate effective responses</p> <p>Proportion of district health managers who consider that inter-agency and inter-sectoral barriers are not important in delivering effective responses</p>
Outcome 3: disease prevention measures piloted in areas of heightened health risk due to climate change	<p>Proportion of districts implementing a locally appropriate control intervention within a pre-defined appropriate response period</p> <p>Existence of response plans in pilot districts</p>
Outcome 4: cooperation among participating countries promotes innovation in adaptation to climate change including variability	<p>Adoption or adaptation of practices piloted through project</p> <p>Use and value of website</p> <p>Documents project experiences in ALM and UNDP Teamworks to guide future GEF, SCCF, UNDP, and WHO interventions on adaptation to climate change including variability</p>

Although it took most countries time and training to become familiar and comfortable with the VRA, the countries found it to be an effective approach to measuring changing vulnerability.

The outcome indicators are firmly rooted in activities routinely undertaken by Ministries of Health, such as monitoring and evaluation for malaria control programs, but expanding them to incorporate risks associated with climate variability and change. As a result, the indicators are appropriate to the outcomes and outputs and are indicators that can be modified as appropriate to further adaptation activities by the participating countries.

### ***3.1.3 Assumptions and risks***

Assumptions underlying the project design included that adaptive capacity, as perceived by health-care personnel, will have real impacts in terms of improved treatment of climate-sensitive health risks; that three years' worth of data is sufficient to validate the early warning system against intra or inter-annual climate and disease variability; the local health facilities have necessary tools and capacity for timely reporting; the MoH supports action to clarify mandates and simplify procedures, and acts promptly; district staff are willing to undertake additional responsibilities, permitting rapid development of plans; and the length of project implementation is sufficient to demonstrate effective responses to climate-sensitive health risks and for lessons to be transferred to other countries before the end of the project.

An implicit assumption was that early warning systems could be developed in all countries trying to do so. This was a reasonable assumption given the limited experience with developing early warning systems for the health sector. However, doing so was particularly challenging when there was limited health data, either because of small populations or because data were not collected frequently enough to detect an association

between health outcomes and environmental data. The countries exhibited flexibility in dealing with this constraint by instead focusing on strengthening the integrated surveillance of climate-sensitive health outcomes; this includes health and environmental variables. Doing so will improve the situation over baseline and facilitate improved comparison and evaluation between the baseline situation and the situation at the end of the project in terms of prevention of health impacts.

The no-cost one-year extension was very helpful in providing time to demonstrate responses were effective and to identify lessons learned.

Risks outside the control of the health sector included that national / international meteorological agencies did not prioritize or have adequate budgetary resources to support their contributions to data collection and analysis; staffing levels and training were not adequate for district health managers to engage in the project; staff turnover would negate the benefits of training; national and international organizations did not provide sufficient resources to control targeted health issues; WHO headquarters did not continue to target health adaptation; and WHO and UNDP management and oversight procedures were insufficient to ensure project resources and efforts were not compromised or diverted by poor governance and corruption, or were at any risk of undermining human rights.

WHO headquarters and UNDP monitored national projects for risks during the project. One problem not easily addressed was staff turnover. The slowly building national capacity on climate change and health meant there were few people trained in climate change and health when a key member of a national project team left, which meant time was needed to bring new staff up to speed on the project.

The project delay created additional risks not foreseen during project formulation. Outcomes and outputs needed to be modified in at the beginning of project implementation for several countries: in Barbados, the national priorities changed before project implementation; and Jordan and Uzbekistan used the project delay to obtain additional funding that meant several outcomes were achieved before the project started. An additional risk was the long delay meant national consultants in several countries were no longer engaged, and that MoH and other national ministry / department staff engaged during project formulation had moved to other assignments. This was a particular problem in Barbados where it took time to rebuild a project team.

### ***3.1.4 Planned stakeholder participation***

Extensive stakeholder participation was planned and achieved for each country. The project design phase identified the relevant stakeholders for each country, including national level stakeholders for all countries and local level stakeholders for countries implementing adaptation options at select pilot locations. The stakeholders for each country are listed in section 2.4. The quarterly and annual reports and interviews indicate that stakeholder participation was extensive and effective, with regular meetings to

ensure coordination. Having WHO and UNDP involved at the country level facilitated stakeholder engagement.

#### ***3.1.4 Replication approach***

The project was explicitly designed to learn lessons across the seven countries and range of health outcomes to share with other countries as they design and implement health adaptation options. This was highly successful and will be a lasting legacy of the project. The process of transferring lessons learned started before the project ended as WHO headquarters used the experiences gained to inform development of other health adaptation projects. A review of the success in scaling up in the countries was completed by WHO headquarters and will be published soon.

#### ***3.1.5 Links between project and other interventions within the sector***

As noted, there was limited experience with health adaptation during project formulation, which meant there were few interventions with which to link. The European office of WHO (EURO) started working on health adaptation around the year 2000, so brought that experience to the Uzbekistan project. Other regional offices had varying experience with managing the health risks of climate change and none had ongoing health adaptation projects. As noted, Jordan and Uzbekistan took advantage of the implementation delay to pursue other funding and then modified their national projects to build on the work accomplished. During implementation, some health adaptation funds became available to initiate new health adaptation projects. WHO headquarters has been actively working to ensure the projects are linked, sharing knowledge and experiences.

WHO headquarters and national project teams made significant efforts throughout the project to link the activities with other intervention within the sector. Further WHO headquarters forged links internationally and nationally with the Global Framework for Climate Services.

#### ***3.1.6 Management arrangements***

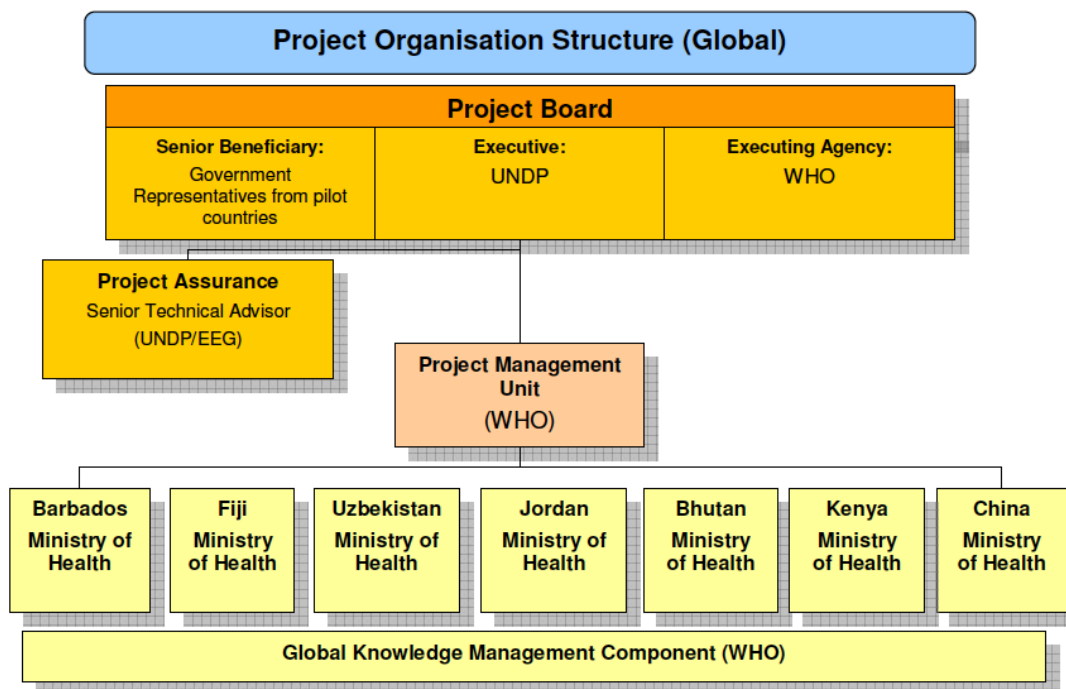
Project management was at national and global levels. WHO headquarters executed the project and managed the disbursement of project resources to its regional and country offices. WHO headquarters reported expenditures to UNDP and provided quarterly and annual reports detailing project progress.

A global project board was established, comprised of the Senior Technical Advisor (STA) for Climate Change Adaptation within the Environment and Energy Group at UNDP as chair, WHO headquarters, and representatives of the Ministries of Health of the pilot countries. The STA supported the project board by carrying out objective and independent project oversight and monitoring functions. The project board was responsible for making management decisions, by consensus, when the WHO project manager required advice, including recommendations for WHO approval of project plans and revisions. To ensure UNDP's ultimate accountability, project board decisions were made in accordance with standards that ensured management for development results,

best value money, fairness, integrity, transparency, and effective international competition.

Each country had a national project coordinator to manage the day-to-day project activities and had a national steering committee composed of key stakeholders to oversee project implementation; the Ministry of Health chaired this committee. The Ministry of Health also identified key person(s) to coordinate and manage the project activities. UNDP country offices participated in the project advisory committee, helping coordinate the project activities with other UN/UNDP adaptation initiatives in the country. WHO country offices also participated in the project advisory committee and contributed towards the execution of the project, including issuing and monitoring contracts to the Ministry of Health and other sub-contractors according to WHO processes, and providing technical guidance and resources.

The figure shows the overall management structure:



The structure was highly effective for managing the project. The countries appreciated being part of a global project, where they could share experiences with other countries in the same stages of implementation. They found the annual meetings very informative and helpful to learn from others.

### 3.2 Project implementation

As the first global project piloting climate change adaptation to protect human health, the implementing and executing agencies and national project teams did not have prior experiences, best practices, and lessons learned on which to build. It was reasonable to expect the project would have particular challenges with initiating activities in this area.

However, implementation went relatively smoothly. WHO and UNDP had considerable experience and expertise working with the seven countries on other issues, which were important factors in successful implementation. Further, WHO and UNDP are to be congratulated on showing best practice in cooperation across UN agencies. Although each agency has different mandates and reporting requirements, the commitment of each agency to finding solutions is to be commended.

The progress of national level implementation varied across the countries, with all countries ending with highly successful implementation.

### **3.2.1 Financial planning and co-financing**

The project budget was \$21,158,000, with \$4,500,000 coming from the GEF SCCF. The table lists the total expenditures of the GEF SSC funds from the project start date of January 2010 through 2014, the proposed budget for 2015, the total budget assuming all funds are dispersed in 2015, and the budget in the Project Document. The project total is \$4,565,209.19, indicating a very slight (1.4%) over spend of the budget, which is to be commended. The outcomes and project management unit expenditures were very close to the projected budget, indicating careful financial tracking by WHO headquarters and the national project teams.

	Total expenditure through 2014	Proposed budget 2015	Total budget	Project Document budget
Outcome 1	1,111,628.14	127,554.94	1,239,183.08	1,146,000
Outcome 2	616,326.62	381,998.18	998,324.80	1,014,000
Outcome 3	1,102,581.50	484,518.10	1,587,099.60	1, 540,000
Outcome 4	232,136.76	162,648.67	394,785.43	381,000
Project management unit	345,816.28	0	345,816.28	419,000

The national project teams were slightly uneven in their expenditure rate, as would be expected. One country, Barbados had the lowest expenditure rate and made available \$150,000 to WHO headquarters and to the other countries. \$30,000 of the funds was transferred to WHO headquarters to organize the training workshop on data analysis for designing and implementation of health early warning systems. Based on country requests and their capacity to implement further health adaptation measures, \$50,000 was transferred to China, \$40,000 to Bhutan, \$40,000 to Uzbekistan, and \$20,000 to Fiji. The countries used the funds to support additional efforts to achieve their outcomes and outputs. Fair and effective redistribution of the unspent monies ensured that fast moving

countries were not held back and slow countries did not undermine the project. The redistribution was done openly and transparently, allowing all views to be heard before final decisions were made.

Projected co-financing for the project was \$16,658,000. The table shows the source, expected amounts, and actual co-financing.

<i><b>Co-financing source</b></i>	<i><b>Expected co-financing</b></i>	<i><b>Actual co-financing</b></i>	<i><b>Comments</b></i>
Government of Barbados	1,319,000	776, 939	
Government of Bhutan	52,000	51,960	
Government of China	1,587,000	4,071,638	
Fiji Ministry of Health	725,000	1,145,114	
Fiji Meteorological Service	71,000		
Fiji Department of Environment	1,923,000		
Fiji Ministry of Works	10,000		
Government of Jordan	3,540,000	7,445,000	Includes contributions from the Jordan Food and Drug Administration; University of Jordan; and German Jordanian University
Government of Kenya	210,000	130,000	
DFID and Gates Foundation (through WHO Kenya)	2,100,000	2,092,484	DFID: \$1,647,848 Gates: \$444,636
German Environment Ministry (through WHO EURO)	1,400,000		
WHO Centre for Environmental Health Activities	1,531,000	5,526, 935	
Pan American Health	435,000		



Organization / WHO			
UzHydromet		344,520	
WHO Headquarters	1,756,000	672,000	
Total		21,912,070	

In Uzbekistan, UzHydromet contributed \$344,520. The total co-financing for Jordan was \$12,971,935. The total co-financing for Kenya was \$2,222,484.

### ***3.2.2 Monitoring and reporting process***

Several methods of monitoring and reporting were used throughout the project. Progress reports were prepared quarterly, describing the activities conducted and the appropriated financing and relevant inputs (budget codes). National annual reports were prepared describing the country's progress on achieving its objective and outcomes, comparing activities conducted with the annual work plan. WHO headquarters used the quarterly reports to prepare a comprehensive annual report.

Annual reporting on progress towards the objectives and outcomes was conducted through the GEF project implementation review procedure, whereby the project team, together with the UNDP, provides their rating of the project's progress for submission to the GEF. Annual meetings of the project board provided input for the annual report.

The process was highly effective for monitoring national progress on the outcomes and outputs, and facilitated exchange across countries in information. Further, annual meetings of the project board were considered very valuable by the national project teams for exchanging information and lessons learned.

As discussed elsewhere, the vulnerability reduction assessment was used to measure progress in increasing the adaptive capacity of national health system institutions, including field practitioners, to respond to climate-sensitive health risks.

### ***3.2.3 Execution and implementation modalities***

The executing and implementing modalities when remarkably well, although not always perfectly. The project built on the strengths of each agency, with excellent cooperation and collaboration throughout. The project shows best practice for multi-agency execution and implementation modalities.

### ***3.2.4 Management by WHO Geneva***

The complexity of the project, with seven partners working on similar outcomes and outputs, but with very different national and local contexts and needs, required large investments of time and effort by WHO headquarters. The limited budget allocated was not a barrier to significant effort and input by WHO headquarters staff, although limited some travel to participating countries. The pilot countries reported that WHO headquarters input was critical to the success of the project, with input highly valuable and timely.

### **3.2.5 Coordination and operational issues**

As noted, there was excellent coordination throughout the project between WHO and UNDP. At the national level, all interviewees underscored the very good collaboration at the national and international level. The project management team made very effort to engage with national and local stakeholders around the outcomes of interest, in many cases forging new partnerships across departments and ministries. Regular meetings with all stakeholders were deemed highly valuable and productive. The partnerships created exceeded the expectation of project design.

### **3.3 Project results**

Based on a desk review of project documents and on interviews with WHO headquarters, UNDP, and national project teams, this section presents the findings of the terminal evaluation concerning the project results. The evaluation of the results are structured around the GEF five major evaluation criteria: *relevance, effectiveness, efficiency, results/impacts, and sustainability*.

- *Relevance* relates to an overall assessment of whether the project is in keeping with its design and in addressing the key priorities to ensure that the obligations under the relevant UN Conventions are met and in keeping with the donors and partner policies, as well as with local needs and priorities.
- *Effectiveness* is a measure of the extent to which formally agreed end of project results (outcomes) have been achieved or could be expected to be achieved.
- *Efficiency* is a measure of the productivity of the project intervention process, i.e. to what degree the outcomes achieved derive from efficient use of financial, human, and material resources. In principle, it means comparing outcomes and outputs against inputs.
- *Results/Impacts* are the long-term results of the project and include positive and negative consequences, and whether these are foreseen and expected.
- *Sustainability* is an indication of whether the outcomes (end of project results) and the positive impacts (long term results) are likely to continue after the project ends.

#### **3.3.1 Project objective: Increase the adaptive capacity of national health system institutions, including field practitioners, to respond to climate-sensitive health risks**

All pilot countries completed a baseline Vulnerability Reduction Assessment (VRA) by 30 June 2013. The average baseline score was 2.14. Average country scores were 2.95 for Barbados, 2.03 for Bhutan, 2.56 for China, 2.83 for Fiji, 1.57 for Jordan, 1.1 for Kenya, and 1.93 for Uzbekistan.

The pilot countries decided in 2014 that it was too early to usefully measure a substantial change in perceived vulnerability by decision makers and that it would be more meaningful and efficient to conduct a final VRA exercise during the last year of project implementation (2015). Although the target level by the end of the project is improvement in the VRA score averaged across all countries, given the low level of

understanding of the health risks of climate variability and change, it would not be surprising if some country VRA scores declined (i.e. showed an increase in vulnerability) as stakeholders increased their understanding of the current and projected situation with respect to climate change in their country.

### ***3.3.2 Achievement of Outcome 1: Establish early warning and response systems with information on the likely incidence of climate-sensitive health outcomes***

All countries made significant progress and are expected to achieve have implemented integrated surveillance of climate-sensitive health outcomes, which will be a significant improvement over baseline. All countries analyzed retrospective meteorological and health data to identify any trends in health impacts. Early warning systems are working in several countries, with more systems expected to come online within the time frame of the project. Barbados and Jordan are not developing early warning systems (see below). There was a noticeable difference in achievements between 2013 and 2014, indicating the countries made good use of the one-year no-cost extension.

For Jordan, this Outcome was modified to: *A comprehensive and integrated monitoring and surveillance systems for wastewater reuse activities is in place.* Jordan took advantage of the delay in project funding to obtain additional funds to begin the proposed work. Jordan is ranked among the poorest countries in the world in water availability. Resources are already seriously limited and are far below under the water poverty line of (1000) m<sup>3</sup> per capita per year. On a per capita basis, available water from existing renewable sources is projected to fall from 150 m<sup>3</sup>/capita/year in year 2003 to 90 m<sup>3</sup>/capita/year by the year 2025. Climate change is expected to increase water scarcity that will reduce the per capita water share for Jordanians. Therefore, the project focused on managing the potential health impacts associated with full implementation of treated wastewater reuse in agriculture as a strategic alternative water supply.

The project team showed flexibility and creativity in managing the project, ensuring that activities promoted achieving the project objective while altering outputs that were achieved through other projects or were no longer relevant. Despite the typical challenges encountered when developing cooperative relationships across departments and agencies with differing mandates with respect to water availability, Jordan achieved the outputs; (1) improved coordination and implementation of systems monitoring the quality of treated wastewater used in agriculture; (2) improved coordination and implementation of systems monitoring food safety; (3) reliable health and epidemiologic surveillance data on diseases related to use of wastewater; and (4) increased social acceptance of agricultural products irrigated with treated wastewater. The project team noted the project steering committee was able to overcome some of the challenges with overlapping roles and responsibilities, but that national legislation will be needed to resolve all the issues.

For the other six countries (Barbados, Bhutan, China, Fiji, Kenya and Uzbekistan), baselines were established in 2012. At the start of the project, none of the health care facilities of the six pilot countries were monitoring climate-sensitive health conditions

and reporting on a regular basis. However, before the project started, Bhutan and Barbados were already collecting and reporting data for a specific climate-sensitive condition (dengue and malaria, respectively) but without correlating it with the climate data and without regular reporting. During 2012, most countries started collecting retrospective health and climate data (for at least the past 5 years) and analyzing relationships.

During 2014, all countries continued implementing relevant activities to strengthen the integrated surveillance of climate-sensitive health outcomes. Health care facilities of five pilot countries (Bhutan, China, Fiji, Kenya and Uzbekistan) monitor climate-sensitive health outcomes (including outbreaks) and report them regularly, which corresponds to approximately 71.4% of pilot health facilities in all implementing countries. This represents an increase of 14.3% compared to the previous year. However, the project was designed to reach 90% of the pilot health care facilities, indicating a short fall.

In Kenya, 100% of the four pilot zones monitor malaria, including outbreaks, on a weekly basis; in Uzbekistan, intestinal infections, respiratory, and cardiovascular diseases are monitored in Tashkent and Sirdarya regularly; and in Bhutan, dengue and Japanese encephalitis are monitored in four districts in the southern half of the country and a system of gathering, reporting, and analyzing vector-based data was established.

The National Steering Committee in Bhutan, composed of representatives from the Ministry of Health, Ministry of Environment, the project coordinator, and WHO country office staff, decided to focus on strengthening the integrated surveillance instead of designing an early warning system at this stage, including monitoring of relevant environmental variables. China developed software modules for a heat-related health risk early warning system using a mathematical model based on historical health and climate data. This software provides early forecasts of health risks associated with heat and related public health recommendations. Recommendations are translated into different communication products to reach the general population in those districts (e.g. banners, posters, and screens on the street).

Fiji monitors climate-sensitive health outcomes (typhoid, dengue, leptospirosis and diarrheal illnesses routinely and for outbreaks) but does not report them regularly due to a weak surveillance system. The project is supporting the National Health System to report in a regular basis and strengthened their Notifiable Diseases Surveillance System, as a prerequisite to do so.

Barbados decided to focus on strengthening the integrated surveillance of vectors based on two studies to determine the likelihood developing an early warning system. An analysis of dengue cases over the period 2004 – 2013 was able to retrospectively predict three dengue outbreaks for the years 2006-2007, 2010-11, and 2013. However, due to small number of dengue cases, prospective predictions of dengue outbreaks appear unlikely.

### ***3.3.3 Achievement of Outcome 2: Improve the capacity of health sector institutions to respond to climate-sensitive health risks based on early warning information***

The activities undertaken in each country were similar in that significant training and capacity building occurred, and unique in that the specific activities were tailored to national needs and circumstances. These activities suggest highly satisfactory progress will be made in achieving this outcome.

For the indicator, proportion of district health managers who consider their climate informed risk management/response plan enables them to be adequately prepared and initiate effective responses, by mid-2014, 71.4% of pilot health services had access to relevant and timely environmental, meteorological, and/or climate data (i.e. at least precipitation, humidity, and temperature); this represents an increase of 14.3% compared with 2013. Data were available in Bhutan, China, Fiji, Kenya and Uzbekistan.

For the indicator, proportion of district health managers who consider that inter-agency and inter-sectoral barriers are not important in delivering effective responses, the baseline VRA for the project was established in June 2013. At that time, 30.3% of the 142 district health managers across the countries considered their response plans enabled them to initiate effective responses to the climate-sensitive health risks of concern; the numbers of participants per country were 25 in Barbados, 15 in Bhutan, 63 in China, 10 in Fiji, 7 in Jordan, 15 in Kenya, and 7 in Uzbekistan. This figure varies considerably across the countries. None of the district health managers in Bhutan, Jordan, and Uzbekistan considered their response plans effective. The percentages for the other countries were 40% for Barbados; 51.97% for China (Harbin 60%, Nanjing 40.9%, and Shenzhen 55%); 70% for Fiji; and 50% for Kenya. It is expected that the technical support and project activities will result in an improvement in the next VRA.

At baseline, 74.9% of district health managers across the countries considered that inter-agency and inter-sectoral barriers constrained the delivery of effective responses.

Percentages for the individual countries were:

- 65% in Barbados;
- 57.7% in China (Harbin 65%, Nanjing 68.2%, and Shenzhen 40%);
- 80% of respondents in Fiji felt the willingness to adapt exists, but health facilities lacked the capacity and resource to do so. 20% considered that inter-agency and inter-sectoral barriers constrained the delivery of effective responses; this included 10% who felt there was no willingness to adapt and 10% who felt neither the willingness nor the capacity/resource was present;
- 71.43% in Jordan;
- 50% in Kenya;
- 100% in Bhutan; and
- 100% in Uzbekistan.

Again, the project activities related to institutional capacity building and creation of an enabling environment are expected to result in an improvement in the baseline by the end of the project.

Each country invested in considerable training that will undoubtedly improve knowledge and capacity to better manage the health risks of climate change. For example, in Barbados in the last quarter, 84 environmental health officers were trained on the integration of climate into their health data in conjunction with GIS targeted vector control. In addition, 24 lectures on climate change and health were presented to churches, social groups, schools, government institutions and a health NGO across the island. A student's workbook on climate change and health for primary and secondary schools is being developed in conjunction with the Ministry of Education. Further, climate change was integrated into the Environmental Health Department work plan of the Ministry of Health. It is embedded into the 2014-2015 planning cycle and is expected to be a permanent feature of the Environmental Health Department at the level of environmental health specialists. Climate change was integrated into the environmental health monitoring tool.

In Bhutan, an environmental health and climate change module was developed and incorporated in the curriculum of pre-service health workers at the Royal Institute of Health Science. The project also supported and purchased reference books on environmental health/climate change for the students. Four health professionals, two medical officers, one nurse, and one program staff from Emergency Medical Services were trained in Public Health Management in Disasters and Emergencies. The trained personnel will further train the emergency medical team in the country. A workshop on reducing public health risks from climate change was conducted for 40 local leaders and 41 other participants, including District Environment Officers, District Health Officers, and District Agriculture Officer from all 20 districts. The workshop covered the health risks associated with climate change and adaptation measures for managing these risks. A small group exercise identified the current health vulnerabilities to climate change in each district and developed a community-based adaptation plan. The community adaptation plans will be used in developing a climate change and health strategy. Further, a high level advocacy workshop on climate change and human health for policymakers sought commitments from key stakeholders to ensure that health concerns are addressed in decisions related to climate change taken in other sectors.

China provides an excellent example across all three national level outcomes of establishing an early warning system, in this case for heatwaves, building capacity to use the system, and piloting prevention measures to reduce the health burdens of heatwaves. For outcome 2, China developed software modules for a heat-related health risk early warning system, using a mathematical model based on historical health and climate data. This software is being used to forecast health risks associated with heat and to provide public health recommendations for particularly vulnerable districts. China trained workgroup members in the cities of Harbin, Nanjing, and Shenzhen on managing the risks of heatwaves. Different communication products (e.g. banners, posters and screens

on the street) target the general population in these districts. Meteorological, air pollution, mortality, and hospital admission data continued to be collected so as to revise and improve the early warning system. An evaluation of the early warning system conducted in Nanjing and Chongqing indicated a good relationship between the response grade (in accordance with the health risks level forecast by the early warning system software) and the daily maximum temperature. A symposium was held in October 2014 on developing a video to highlight the health risks of heatwaves, the development of the heatwave early warning system, and how the system can reduce the health burden of heatwaves. Attendees included key members of the project team, cameramen from the National Institute for Environmental Health and Related Product Safety of China CDC (the project implementing institute) and the four cooperation institutes (Jiangsu Provincial CDC, Shenzhen CDC, Harbin CDC, and Chongqing CDC), and professionals from the proposed video production company. More than 20 representatives participated in the symposium to discuss how to develop a project implementation video and the kind of materials that should be collected and prepared.

#### ***3.3.4 Achievement of Outcome 3: Pilot disease prevention measures in areas of heightened health risk due to climate change***

All countries are on track to successfully achieve outcome 3, with activities of high benefit to the pilot locations and with lessons learned that will be useful at the national level for scaling up project activities.

For the indicator, existence of climate informed prevention/risk and emergency management plans in pilot districts, by the end of June 2014, climate-informed prevention or risk activities were implemented in Barbados, Bhutan, China, Fiji, and Kenya. By quarter 18, Uzbekistan had implemented such plans.

For the indicator, proportion of districts implementing a locally appropriate prevention/risk and emergency management intervention within a pre-defined appropriate response period, by the end of June 2014, 71.43% of pilot districts in the seven countries were implementing locally appropriate prevention/ risk and emergency management interventions within a pre-defined appropriate response period. That rate is on track to be much higher by project completion.

Fiji is an example of the activities achieved under this outcome. The Fiji Red Cross Society worked with pilot communities to develop seasonal calendars through focus group discussions to identify traditional indicators of climate change. Communities then used these calendars as a simple early warning system. In each district (Ba and Suva), community committees were set up to enable community ownership and implementation of community health adaptation activities. The sessions also covered health protection tips during times of disasters/ emergencies. The Fiji Red Cross also facilitated sessions to raise awareness of climate-sensitive health outcomes among participating community groups. Some lessons learnt from capacity building activities in the project and the potential role of climate-based disease early warning systems were shared during a WHO

hosted Special Session on Climate Change and Health at the 12th Pacific Science International Congress at the University of the South Pacific.

In Uzbekistan, a Meteorological Comfort Index was developed based on weather forecasts of air temperature, air pressure, wind speed, relative humidity, and precipitation for 10 days; the index was then included in the early warning system. The meteorological forecast is based on the data from the European Center for Medium-Range Weather Forecasts and the Global Forecast System. The index is calculated for each forecast meteorological parameter and the results published in the system database and visualized in three color gradations (red, yellow, and green). Testing of the early warning system will be undertaken in winter/spring. The decrease in the number of cases of acute intestinal infection, select cardiovascular diseases, and respiratory diseases were selected as indicators.

Jordan implemented a pilot study for safe use of wastewater in agriculture through the University of Jordan. Two experiments were conducted during the 2014 growing season. The objective of one was to investigate whether irrigation with water contaminated with pathogenic microorganism was the main source for contamination of raw vegetables with bacterial pathogens; and whether harvesting, handling, transportation, and marketing processes are noteworthy sources of contamination. The second experiment was conducted to validate health protection measures established by the WHO 2006 guidelines for the Safe Use of Wastewater, Excreta and Greywater. Results of these experiments will be incorporated into project activities and will be communicated to other countries using or planning to use treated wastewater in agriculture.

### ***3.3.5 Achievement of Outcome 4: Promote innovation in adaptation to climate variability and change through facilitating cooperation among participating countries***

The project provides a best practice example of how WHO headquarters and regional offices and the national project teams effectively used relatively limited funding to catalyze a range of activities to build capacity not just within the project but more broadly across a range of stakeholders at local and national levels. The additional meetings organized by the national project teams were very successful at transferring knowledge and building capacity to manage the health risks of climate change. Given the general low (but growing) awareness of the health risks of climate change and the very high demand for more training, ensuring future projects include funding for (1) targeted training courses, such as training on analyzing weather and climate data, or on developing and deploying early warning systems; and (2) more frequent meetings of project teams, particularly early in the project. Learning curves on health adaptation are fairly steep at the beginning of a project; so holding meetings about every six months for the first two years could support more rapid capacity building on project implementation.

For the indicator, adoption or adaptation of practices piloted through the project, annual meetings of the project board and national project managers helped ensure regular discussions of technical and project management issues related to efficient implementation, and helped with sharing experiences that all countries found very



helpful. In addition, other workshops were convened as needed, such as the five-day workshop on climate and health data analysis for early warning systems in May 2014 in Nairobi. This workshop included representatives from ministries of health and meteorological services of all countries plus Tanzania and Malawi. Feedback from the workshop fed into draft guidance on early warning systems and helped ensure that other countries starting the process of developing early warning systems for health could gain from the project experiences.

A wide variety of workshops and seminars were sponsored at the national level to transfer knowledge and experiences. For example, an inter-country seminar was held in China in April 2014 to strengthen inter-country sharing of experiences, particularly on early warning systems for health. Representatives from China as the host country, Barbados, Fiji, Kenya, and Uzbekistan attended the seminar. Another example is an international training course on agricultural reuse of treated wastewater held in June 2014 in Jordan. The objectives were to further disseminate WHO efforts to promote safe agricultural reuse of treated wastewater as an adaptation action, and to provide background information on integrated wastewater management and impacts of reuse of treated wastewater on soil, agricultural products, public health, and ground water pollution. The training was organized by Jordan and attended by representatives from Barbados and Bhutan.

For the indicator, use and value of the website, from 1 July 2013 to 30 June 2014, the publicly accessible webpage was accessed 10,019 times. Use of the project workspace (<https://workspace.who.int/sites/climate-health/default.aspx>) was limited, with countries instead making more use of opportunities to build on connections fostered by the project board meetings and training exchange visits to share experiences directly.

For the indicator, documented project experiences in ALM and UNDP teamworks to guide future GEF, SCCF, UNDP, and WHO interventions on adaptation, guidance documents were completed, with others to be available soon. One document provided guidance on conducting health and vulnerability assessments (<http://www.who.int/globalchange/resources/adaptationresources/en/>) and another provided guidance on how to protect health from climate change through the health component of a national adaptation plan (H-NAP) (<http://www.climateandhealthalliance.org/resources/international-guidance>) was made available. Guidance on developing and deploying a climate-health early warning systems will be released soon. In addition, an Advanced Learning Package on Health and Climate Change was finalized and is about to be launched by UNITAR as a product of the UN:CCLearn initiative.

WHO recently completed a synthesis report on lessons learned, challenges, and opportunities for scaling up health adaptation to climate change (see section 3.3.6).

### ***3.3.6 Sustainability of project results***

Although there is always a challenge in sustaining projects and the processes developed once funding ends, processes in all countries are on track to ensure health is included in national adaptation plans. Without either creating funded climate change and health positions within national ministries of health or finding another source of extra-budgetary support, the level of activity is likely to decline at least to some degree. Including health in the national adaptation plans will reinforce the risks health systems are facing to the national government and will help ensure that health is a priority focus for future funding to increase resilience.

Of relevance is the WHO headquarters review and synthesis of the first five years of implementation (2008-2013) of health adaptation projects in low- and middle-income countries worldwide. The report will be released quite soon. The overall goal was to identify lessons learned and good practice examples from pilot health adaptation projects, to facilitate assessing and overcoming barriers to implementation and to scaling up. The project was a desk review conducted of evaluation reports and other materials from three multi-country projects covering fourteen countries. The countries included are Barbados, Bhutan, China, Fiji, Jordan, Kenya, and Uzbekistan (this project); China, Jordan, and the Philippines (in the health components of MDG Achievement Fund); and Albania, Kazakhstan, Kyrgyzstan, Macedonia, Russia, Tajikistan, and Uzbekistan (in the WHO EURO project “Protecting health from climate change: a seven-country initiative” funded by the International Climate Initiative of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety). Relevant recommendations and conclusions include:

- Irrespective of resource constraints, low and middle-income countries need to continue to prepare themselves through appropriate public education and awareness programs, including disaster preparedness measures, infrastructure for effective resettlement of displaced people, and better understanding of health impacts on specific human settlements (e.g. communities along river basins).
- Scaling up would be facilitated by explicit consideration of how to do so during project development and implementation. Because the health risks of climate change are partially driven by local and regional contextual factors, it is important when considering scaling up to identify which factors determining the success of particular interventions were generic and so could be transferred to other regions. Some factors determining success will be unique to a location. For example, a common factor for success is the strong commitment of an individual policy maker to health adaptation; if that does not exist, then there will need to be consideration of how to work with local and regional communities to build the necessary conditions for successful scaling up.
- Increasing resilience to the health risks of climate variability and change is likely to be achieved through longer-term, multi-faceted, and collaborative (multi-disciplinary) approaches, with supporting activities (and funding) for capacity building, knowledge communication, and institutionalized monitoring and evaluation. Managing risks that will change as climate and development proceed

will be more effective using iterative approaches, with broad stakeholder engagement. Strengthened cooperation between the health sector and meteorological services in the access and use of climate and health data for adequate preparedness and response remains a key milestone of successful health adaptation efforts.

- Create, identify, and reinforce opportunities for capacity development in the health risks of climate change for the full range of actors from public health and health care professionals to the general public to decision- and policy-makers within the health sector and across ministries. This includes facilitating developing methods, tools, and guidance documents to support countries not only as they implement adaptation programs and activities, but also prior to the implementation phase.
- Encourage donors and development partners to invest sufficient time and resources during the development phase of adaptation proposals, to ensure that country ownership, an enabling environment, stakeholder engagement (with adequate mechanisms to involve communities), and other conditions that facilitate project success are maximized. This includes making sure that approaches and plans for documenting good practices and lessons learned are built into projects from the beginning, and that projects include an output to outline requirements for scaling up. These will strengthen the ability of national and local teams to implement adaptation.
- Support research and development to further understanding of the health risks of climate change, including projections of risks across temporal and spatial scales, and to further understanding of the programs and activities that if implemented would facilitate avoiding, preparing for, responding to, and recovering from impacts.
- Use adaptation projects as opportunities to identify co-financing for adding mitigation components.

At the last meeting of the project board, the national project teams made recommendations to support the effective transition from a project to a programmatic approach to building health resilience to climate change. The recommendations included strengthening the institutional and organizational capacity of the Ministry of Health through ensuring representation in inter-sectoral climate policy mechanisms and integration of climate change resilience activities into routine operational and financial planning within the Ministry of Health and related agencies, as appropriate.

WHO was requested to build on and integrate the project experiences into a comprehensive approach to strengthening technical capacity, including systematic documentation and sharing of training materials; support for curriculum development; supporting training of trainers; and facilitating access to global datasets and model outputs. WHO also was requested to work with the national project teams to draft a summary paper on the results and lessons learned from the project, for submission to a peer-reviewed health journal.

WHO was requested to continue facilitation of collaboration between the participating countries beyond the project end-date, including through inviting national project staff as technical support for other country projects, and establishing a forum for exchange of experience in building health resilience to climate change.

WHO and the national project teams agreed to identify potential opportunities to promote the outcomes of the project within the international health and climate change policy processes, including under the WHO Regional Committees and the World Health Assembly, other regional bodies, and the UNFCCC. WHO and the national project teams also agreed to identify opportunities to mobilize additional financial support for continuation of work within the countries and for wider international initiatives

### ***3.3.7 Country ownership and gender equity***

Having the national projects led by Ministries of Health ensured strong country ownership. Further, the multi-ministry national steering committees significantly strengthened country ownership.

Although the project did not specifically address gender equity, the national projects all focused on increasing the resilience of the most vulnerable population groups and communities. Therefore, it is reasonable to expect the projects did address some gender issues, if not explicitly so. However, without an explicit gender element, the extent to which the countries did address gender equity could not be measured and monitored. WHO developed a training module on mainstreaming gender into health adaptation that will be valuable for future projects

([http://www.who.int/globalchange/publications/Mainstreaming\\_Gender\\_Climate.pdf](http://www.who.int/globalchange/publications/Mainstreaming_Gender_Climate.pdf)).

### ***3.3.8 Mainstreaming***

The level of commitment in all countries to continue working on increasing resilience to the health risks of climate change is very strong, and all countries are working to find national or other support to build on the work accomplished. Countries such as Barbados and Jordan are creating national strategies on climate change and health. China is furthering uptake of the heatwave early warning system in other cities in the four study regions. In addition, all countries as part of the project increased their understanding of the health risks they are facing in a changing climate and identified other issues they need to address over the short- and medium-term.

Two relevant conclusions from the WHO review of lessons learned on scaling up relevant to mainstreaming are:

- Continue to strengthen mainstreaming of health protection to manage the health risks of climate change. National health plans, policies, and budget processes need to explicitly incorporate the risks of current and projected climate variability and change. Projects should be encouraged to focus not just on shorter-term outputs to address climate variability, but also on establishing processes to address longer-term climate change. Investigate approaches, such as theory of change, that can facilitate achieving objectives and not just outcomes. Medium

- and longer-term project funding would facilitate accurate assessments of project and program outcomes.
- Mainstreaming health adaptation monitoring into planning stages, through the establishment of country-specific monitoring and evaluation systems, customized according to country needs, would enable national health adaptation assessments of climate resilient investment strategies at national and local levels. It would be helpful to identify a set of indicators for monitoring and evaluating climate resilience, creating baselines and facilitating the process of longer-term adaptation.

### **3.3.9 *Institutional capacity development***

As detailed throughout the terminal evaluation, the project made significant strides in building institutional capacity, including ministries and departments of health, local and national stakeholders, and institutional linkages (e.g. health and environment). The guidance documents developed will be very helpful to other countries as they begin their health adaptation processes. Further, the experience gained by the countries are being shared throughout their regions and beyond through WHO headquarters and regional offices, technical meetings and other exchanges, and through publications.

#### 4. Rating of project performance

Three main areas of the project performance were assessed:

1. Assessment of project performance, based against expectations of the retrofitted Project Logical Framework. The valuation criteria were: relevance; effectiveness; efficiency; sustainability; and impact.
2. Project finance / co-finance, including the extent of co-financing planned and realized; and variances between project cost and funding data, including annual expenditures.
3. Mainstreaming, including the extent to which the project was successfully mainstreamed with other UNDP priorities, including poverty alleviation, improved governance, prevention and recovery from extreme events, and gender.

In accordance with UNDP/GEF evaluation requirements, the project results, implementation, sustainability, and monitoring and evaluation systems were rated in terms of:

*Highly satisfactory (HS).* The project had no shortcomings in the achievement of its objectives in terms of relevance, effectiveness, or efficiency.

*Satisfactory (S).* The project had minor shortcomings in the achievement of its objectives in terms of relevance, effectiveness, or efficiency.

*Moderately satisfactory (MS).* The project had moderate shortcomings in the achievement of its objectives in terms of relevance, effectiveness, or efficiency.

*Moderately unsatisfactory (MU).* The project had significant shortcomings in the achievement of its objectives in terms of relevance, effectiveness, or efficiency.

*Unsatisfactory (U).* The project had major shortcomings in the achievement of its objectives in terms of relevance, effectiveness, or efficiency.

*Highly unsatisfactory (HU).* The project had severe shortcomings in the achievement of its objectives in terms of relevance, effectiveness, or efficiency.

Rating Project Performance		
	Rating	Comments
<b>Overall Project Results</b>	HS	The project produced significant results to meet the objective, making a highly valuable contribution to increasing the resilience of health systems in Barbados, Bhutan, China, Fiji, Jordan, Kenya, and Uzbekistan. In addition, the national and international capacity built and the lessons learned provide a solid basis for other low- and middle-income countries as they begin health adaptation planning. The guidance documents and other tools developed will prove helpful to other countries and to other sectors.
<b>Project Outcomes</b>		
<i>Overall quality of project outcomes</i>	HS	As the first project to address health adaptation in low- and middle-income countries, the outcomes accurately reflected where countries needed to start with building capacity and implementing options to address their risks from climate variability. Further, the outcomes are relevant to other countries as they begin addressing their vulnerabilities to climate change, so the results of this project will be very helpful to future health adaptation projects.
<i>Relevance</i>	HS	The modified outcomes were highly relevant to the international and national needs for managing the health risks of climate variability and change. The project delay meant modifications of the originally proposed outcomes were needed for several countries. The flexibility and commitment of the countries to using project funds efficiently and effectively meant the outcomes were relevant to the country needs.

<i>Effectiveness</i>	S	There was a strong commitment by all countries to ensuring the project achieved its expected outcomes. Effectiveness varied somewhat across the projects, but all made satisfactory progress in building health system resilience to climate variability.
<i>Efficiency</i>	S	As would be expected with a seven-country project with a wide diversity in initial capacity on climate change and health, countries progressed at different rates. The rate of progress was determined not only by the capacity built to manage the health risks of climate change, but also by national contexts and processes that were generally outside the control of the project team. The countries made good progress even in the face of a variety of constraints.
<b>Sustainability</b>	HS	There is evidence that the capacity built and the national and regional processes established will ensure continued national priorities for incorporating climate change and health into ministry of health policies and plans, and into national adaptation plans.
<b>Implementation</b>		
<i>Overall quality of project implementation/execution</i>	HS	Project implementation and execution were complex, yet were effectively managed by WHO and UNDP. The agencies combined their strengths and provide a best practice example of across UN cooperation.
<b>Monitoring and Evaluation</b>		
<i>Overall quality of M&amp;E</i>	S	The delay in implementing the VRA meant that only a baseline and final evaluation were possible. It would be helpful for future health adaptation projects to develop other indicators that would be comparable over temporal and spatial scales.



## 5. Lessons learned

As the first global project to pilot climate change adaptation to protect human health, there were significant opportunities for learning lessons in developing, deploying, and evaluating adaptation options. Based on the review of documents, interviews, and analysis of information collected, the terminal evaluation identified these lessons learned:

- The pilot project is an excellent example of best practice in several aspects, including multi-UN agency cooperation and collaboration, capacity building, and mainstreaming.
- UNDP and WHO combined their strengths and networks, resulting in supportive and mutually reinforcing roles as the implementing and executing agencies, respectively. The multi-disciplinary nature of the projects required close collaboration between, at a minimum, the ministry of health and the ministry of the environment (or equivalent ministry housing the national meteorological and hydrological services). In countries without a history of such collaboration, having both UN agencies involved facilitated participation.
- The extensive time invested into project design, including country selection, was valuable for ensuring effective project formulation and for facilitating implementation. The countries presented an appropriate range of health risks of climate change.
- International and national level project management were well organized and thorough, with regular communication, monitoring of results, and clear follow-up actions if a potential problem was identified. The engagement of WHO headquarters and the regional and country offices helped support effective and efficient project management. The collaborative spirit of the project teams was evident of a well-managed project.
- At the start of the project, the participating countries had limited capacity to understand and manage the health risks of climate change. Capacity building was achieved through a range of activities, including training workshops, annual meetings, participation in scientific conferences, conference calls, electronic information, and selected visits by WHO headquarters and regional staff. The use of external consultants varied across the participating countries, with some countries finding their input important for project success. While the country project teams would have been appreciated additional training opportunities, overall the project showed that significant capacity could be built amongst health professionals and relevant stakeholders; health professionals are quite interested in better understanding the health risks of climate change, so took full advantage of training opportunities offered. Other countries can use similar approaches to build capacity as they begin vulnerability and adaptation assessments and conducting the health component of national adaptation plans. This also means that future projects should include sufficient budget for training, meetings, and

other capacity building activities. The national projects also showed the value of transferring knowledge and tools to the full range of health system actors, the general public, and decision- and policy-makers.

- The project clearly demonstrated that health protection to manage the health risks of climate change could be effectively mainstreamed into national health policies and plans. Country-specific monitoring and evaluation systems, customized to country needs, enabled national health adaptation assessments to identify priority areas for mainstreaming.
- At the same time, the national projects primarily focused on the health risks of current climate variability. Future projects should explicitly incorporate consideration of longer-term climate change. In addition, building iterative management components into policies and plans would help facilitate future resilience as the climate continues to change.
- Scaling up should be likely for most participating countries conducting pilot studies, but it would be better for future projects to incorporate a specific output to develop a plan for scaling up, including estimating the necessary human and financial costs.
- Four years is a short period in which to demonstrate the success of an adaptation project. The one-year no cost extension was important for the project success.

## 6. Conclusions and recommendations

This first global project to pilot climate change adaptation to protect human health was highly successful, with excellent examples of best practice in several aspects, including multi-UN agency cooperation and collaboration, capacity building, and mainstreaming. The design was well thought through, providing a range of lessons learned that will be helpful for other countries as they start conducting the health component of their national adaptation plans. The effectiveness of the project is evident in the results achieved and the capacities created in the health sector to begin addressing the risks of climate change. The national projects also showed the value of transferring knowledge and tools to the full range of health system actors, the general public, and decision- and policy-makers. The project clearly demonstrated that health protection to manage the health risks of climate change could be effectively mainstreamed into national health policies and plans.

*Recommendations include:*

The national projects had significant impact on increasing resilience to selected health risks of climate variability and change. The capacity built means the follow-up to the projects could provide more comprehensive impact across the range of risks the countries are facing.

Future projects would benefit from investing sufficient time into project formulation, to ensure that country ownership, an enabling environment, stakeholder engagement, and other conditions that facilitate project success are maximized. Strengthening cooperation between the health sector and meteorological services in the access and use of climate and health data should be part of the process of project formulation.

UNDP and WHO headquarters were extremely effective partners; continuing that partnership would be beneficial for future projects. Engaging UNDP and WHO headquarters and the regional and country offices in national projects would be effective in supporting implementation, capacity building, sharing lessons learned, and project management. It would be helpful to develop guidance on monitoring and evaluation systems for health adaptation projects that could be customized to country needs, while having a consistency that would facilitate comparisons across countries.

The mix of capacity building used in the project was highly successful, including training workshops, annual meetings, participation in scientific conferences, conference calls, electronic information, and selected visits by WHO headquarters and regional staff. It would be helpful for future projects to have sufficient funding for (1) targeted training courses, such as training on analyzing weather and climate data, or on developing and deploying early warning systems; and (2) more frequent meetings of project teams, particularly early in the project. Learning curves on health adaptation are fairly steep at the beginning of a project; holding meetings about every six months for the first two years could support more rapid capacity building on project implementation. Capacity development across the full range of actors from health systems to decision-makers to the general public would be beneficial.

Future projects should explicitly incorporate consideration of longer-term climate change, building iterative management approaches into policies and plans to ensure resilience as the climate continues to change. It also would be helpful for future project to include a specific output to develop a plan for scaling up.

Adaptation is a long-term process. To the extent possible, it would be beneficial to support longer-term projects, to ensure sufficient time for implementation and monitoring and evaluation of results.

## **Annex A: Terms of Reference**

### **Purpose and scope of the assignment**

An overall approach and method for conducting project terminal evaluations of UNDP supported GEF-financed projects has developed over time. The evaluator is expected to frame the evaluation effort using the criteria of relevance, effectiveness, efficiency, sustainability, and impact, as defined in the UNDP Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects. A set of questions covering each of these criteria was drafted and is included with this TOR. The evaluator is expected to amend, complete and submit this matrix as part of an evaluation inception report, and shall include it as an annex to the final report.

The evaluation must provide evidence-based information that is credible, reliable and useful. The evaluator is expected to follow a participatory and consultative approach ensuring close engagement with local stakeholders, in particular the GEF Operational Focal Point, GEF SGP Country Office, project team, UNDP GEF Technical Adviser, WHO staff, and relevant stakeholders. Interviews will be held with the following organizations and individuals at a minimum: WHO Headquarters, GEF SGP and Ministry of Health in the 7 pilot countries.

The evaluator will review all relevant sources of information, such as the project document, project reports – including annual PIR, project budget revisions, mid-term review, progress reports, project files, and any other materials that the evaluator considers useful for this evidence-based assessment.

### **Evaluation Criteria and Ratings**

And assessment of project performance will be carried out, based against expectations set out in the retrofitted Project Logical Framework, which provides performance and impact indicators for project implementation along with their corresponding means of verification. The evaluation will at a minimum cover the criteria of: relevance, effectiveness, efficiency, sustainability, and impact.

#### **Project finance/ co-finance**

The evaluation will assess the key financial aspects of the project, including the extent of co-financing planned and realized. Project cost and funding data will be required, including annual expenditures. Variances between planned and actual expenditures will need to be assessed and explained. The evaluator will receive assistance from the project team to obtain financial data in order to complete the co-financing table.

### **Mainstreaming**

UNDP-supported GEF-financed projects are key components in UNDP country programming, as well as regional and global programmes. The evaluation will assess the extent to which the project was successfully mainstreamed with other UNDP priorities, including poverty alleviation, improved governance, the prevention and recovery from natural disasters, and gender.

The evaluator will assess the extent to which the project is achieving impacts or progressing towards the achievement of impacts. Key findings that should be brought out in the evaluation include whether the project has demonstrated improvements in the impacts included in the logical framework.

### **Conclusions, recommendations and lessons**

The evaluation report must include a chapter providing a set of conclusions, recommendations and lessons.

### **Implementation arrangements**

The principal responsibility for managing this evaluation resides with UNDP and WHO. The Project Team will be responsible for liaising with the evaluator to set up stakeholder interviews, coordinate with the Governments and national stakeholders in the pilot countries.

### **Evaluation deliverables**

The consultant is expected to deliver the following:

- Inception report: the evaluator provides clarifications on timing and methods no later than two weeks before the evaluation is finalized. Evaluator submits report to UNDP and WHO.
- Draft final report (per template) with annexes; within 2 weeks of the end of the consultancy. Sent to countries and reviewed by UNDP and WHO.
- Final revised report; within 1 week of receiving UNDP and WHO comments on draft; sent to GEF EO for uploading to relevant sites and PIMS.

### **Evaluator Ethics**

Evaluation consultants will be held to the highest ethical standards and are required to sign a code of conduct upon acceptance of the assignment. UNDP evaluations are conducted in accordance with the principles outlined in the UNEG “Ethical Guidelines for Evaluations”

## **Annex B: Evaluation criteria**

4. Assessment of project performance, based against expectations of the retrofitted Project Logical Framework
  - a. Extent to which the project is achieving or progressing towards achieving impacts. Evaluation criteria: relevance; effectiveness; efficiency; sustainability; and impact
    - i. Relevance
      1. How did the project relate to environment and development priorities at the local and national levels?
      2. How did the project relate to countries development strategies and objectives (UNDAFs, etc.)?
      3. How did the project link with other similar projects in the field, if at all?
      4. How did the project deal with monitoring (e.g. indicators)?
      5. Lessons learnt and future recommendations?
    - ii. Effectiveness
      1. To what extent were the expected outcomes and objectives of the project achieved?
      2. To what extent did the project delivered environmental benefits?
      3. How effective was the project in delivering adaptation capacities for the communities?
      4. How effective were the Project's governance structures?
      5. Lessons learnt and future recommendations?
    - iii. Efficiency
      1. Was the project implemented efficiently, in-line with international and national norms and standards?
      2. Has the Project implementation process been efficient in terms of how the activities were delivered in the field? Were changes necessary to the work plans during implementation?
      3. What were the problems/issues/challenges identified regarding efficient implementations?
      4. How did the administrative processes work out (accounting, disbursement, hiring etc.)?
      5. Lessons learnt and future recommendations?
    - iv. Sustainability
      1. To what extent were there financial, institutional, social-economic, and/or environmental risks to sustaining long-term project results? What are the prospects of sustainability in the mid to long term?
      2. What are the prospects of sustaining the program's effects and benefits in the near future?
      3. How was country-ownership of the projects generated? Does this help sustainability prospects?

4. What are the prospects of partners sustaining activities beyond project termination?
  5. Was capacity building attended to in order to promote sustainability? What sorts of capacity building practices took place that can help with sustainability (generation of policy, training, etc.)?
  6. What are the prospects of replication or scaling up of the projects?
  7. Lessons learnt and future recommendations?
- v. Impact
1. Are there indications that the project contributed to, or enabled progress toward, reduced community and ecosystems vulnerability and/or improved ecological status of ecosystems and livelihoods status of communities?
  2. What was the overall impact of the interventions?
  3. What impact indicators were used to evaluate the effect of the interventions?
  4. How did these indicators relate to the projects monitoring and evaluation process?
  5. Lessons learnt and future recommendations?
5. Project finance / co-finance
- a. Extent of co-financing planned and realized
  - b. Variances between project cost and funding data, including annual expenditures
6. Mainstreaming
- a. Extent to which the project was successfully mainstreamed with other UNDP priorities, including poverty alleviation, improved governance, prevention and recovery from extreme events, and gender



## **Annex C: Documents reviewed and individuals interviewed**

## **Annex D: Mid-term recommendations**

The pilot project is highly relevant to the needs of the seven countries participating in the project. Having WHO as the Executing Agency provides technical support and coordination to the national projects, as well as providing an avenue for communicating experiences and lessons learned to other countries as they begin designing, implementing, and monitoring adaptation to the health risks of climate change. The work conducted by the mid-term review provides valuable lessons about the process of adaptation in the health sector, as well as indicating where further efforts could enhance progress towards achieving and sustainability of the project Outcomes, and to longer-term sustainability.

- A one-year no-cost extension will be critical to allow some countries to complete their Outcomes and Outputs. Several countries would benefit significantly from having another year given the challenges with getting the national projects up and running. Without this extension, there is a very serious risk that projects will not be completed, undermining sustainability of the adaptation achieved.
- Greater flexibility on budget allocation across Outcomes is important to provide further financial support for activities requiring more resources than initially expected. No additional funding would be required to successfully complete the Outcomes and Outputs, although some countries may need to find funding to support the project manager for another year if an extension is granted.
  - Budget allocations should include greater flexibility in the amount of funds that can be used for project management. The limited funding for project management means that in most countries the project manager spends time on procurement and other administrative tasks, significantly reducing the time available for managing technical issues.
- Additional technical support and access to technical skills could enhance national capacity, supporting sustainability of the Outcomes/Outputs. A challenge in the health sector is the low international capacity for designing, implementing, and monitoring adaptation. Additional technical support and access to technical skills would be helpful for building that capacity. Nearly all countries expressed an interest in participation in international short courses, to enhance their understanding of the breadth and depth of issues associated with managing the health risks of climate change. A telling comment from a medical institute in Tashkent was their very high interest in incorporating climate change into medical curriculum, but they did not know who could teach them.
- Consider providing software to translate documents into native languages. Official translations take time and are expensive. Software packages could provide translations of sufficient quality for technical use (although this should be verified).
- To the extent possible within technical and financial realities, it would be helpful to collect data on finer than 10-day intervals to improve the precision and accuracy of early warning systems.
- Revise Outcomes and Outputs to ensure they are within the context of an iterative management approach to managing health risks as they continue to change with climate change and development.