

**United Nations Development Programme**  
**Global Project (*Barbados, Fiji, Uzbekistan, Jordan, Bhutan, Kenya, China*)**  
**PROJECT DOCUMENT<sup>1</sup> (PIMS 3248)**



**Project Title:** Piloting climate change adaptation to protect human health

**UNDP Strategic Plan Environment and Sustainable Development Primary Outcome:** Promote climate change adaptation

**UNDP Strategic Plan Secondary Outcome:** Strengthening post-crisis governance,

**Expected CP Outcome(s):** National capacities are strengthened to mainstream climate change policies into national development plans (BDP Outcome 62)

**Expected CPAP Output(s):** n/a

**Executing Entity/Implementing Partner:** World Health Organization (WHO)

**Implementing Entity/Responsible Partners:**

**Brief Description**

Climate change, including climate variability, has multiple influences on human health. Both direct and indirect impacts are expected including alterations in the geographic range and intensity of transmission of vector-, tick-, and rodent-borne diseases and food- and waterborne diseases, and changes in the prevalence of diseases associated with air pollutants and aeroallergens. Climate change could alter or disrupt natural systems, making it possible for diseases to spread or emerge in areas where they had been limited or had not existed, or for diseases to disappear by making areas less hospitable to the vector or the pathogen. The World Health Organization (WHO) estimates that climate change may already be causing over 150,000 deaths per year.

Despite the increasing understanding of health risks associated with climate change, there has been limited identification and implementation of strategies, policies, and measures to protect the health of the most vulnerable populations. The reasons for this are many including relatively recent appreciation of the links between climate change and health, existing public health related policies and practices not reflecting (unsurprisingly) needs with respect to managing likely climate change-related health impacts, the public health community not mainstreaming climate change considerations into operational health plans among others. The normative (preferred) situation with respect to the problem is one where relevant authorities at the national and sub-national level are capacitated to predict climate change related health impacts, factor climate change risks in health management decision-making processes, test specific management practices as well as share lessons learned. In this context, critical barriers that this project seeks to overcome include the 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 at the district and central level; insufficient investment in testing specific measures to manage climate change-sensitive health risks; and optimizing cross-country learning on managing this type of emerging risks.

The objective of this first global project on public health adaptation to climate change is to "increase adaptive capacity to respond to climate-sensitive health risks" in seven countries. This objective will be realized through the following project specific outcomes:

- An early warning and response system with timely information on likely incidence of climate-sensitive health risks established in the participating countries
- Capacity of health sector institutions to respond to climate-sensitive health risks based on early warning information improved
- Disease prevention measures piloted in areas of heightened health risk due to climate change
- Cooperation among participating countries on innovative adaptation centric strategies, policies and measures are promoted.

Barbados, Bhutan, China, Fiji, Jordan, Kenya, Uzbekistan have been selected, based on differences in priority vulnerabilities to climate change related health risks, to pilot interventions to increase their respective adaptive capacity to respond to the impact of climate change on human health. Project results will be directly relevant to decision-makers in these countries as well other vulnerable countries. To facilitate learning, the UN agencies involved will ensure that best practice experiences are shared across countries and regions. WHO, as an internationally recognized UN body that focuses on health issues will execute the project in coordination with the Implementing Agency, UNDP.

<sup>1</sup> For UNDP supported GEF funded projects as this includes GEF-specific requirements

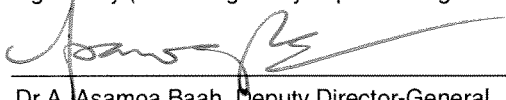
Programme Period:	4 years
Atlas Award ID:	00058229
Project ID:	00072257
Atlas BU:	UNDP1
PIMS #	3248
Start date:	Jan 2010
End Date	Dec 2013
Management Arrangements	Agency Implementation

Total resources required	\$21,159,000
Total allocated resources:	\$21,159,000
• Regular	
o Other:GEF(SCCF)	\$ 4,500,000
o Government (inkind)	\$12,937,000
o Other (WHO; inkind)	\$ 3,722,000
In-kind contributions	\$16,659,000

Agreed by (Government): N/A

\_\_\_\_\_  
Date/Month/Year

Agreed by (Executing Entity/Implementing Partner (WHO)):



14/15/2010

Dr A. Asamoah Baah, Deputy Director-General

\_\_\_\_\_  
Date/Month/Year

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## List of Acronyms

AIACC	Assessment of Impacts and Adaptation to Climate Change
AID	Acute intestinal diseases
ALM	Adaptation Learning Mechanism
AOP	Annual Operations Plan
APF	Adaptation Policy Framework
APR	Annual Progress Report
ARI	Acute Respiratory Infections
ASAL	Arid And Semi-Arid Land
AusAID	The Australian Government's Overseas Aid Program
AWP	Annual Work Plan
CBO	Community Based Organization
CC	Climate Change
CDSORP	Communicable Disease Surveillance an Response Plan
CHARM	Comprehensive Hazard Analysis Risk Management
CI	Confidence Interval
CICETS	Community-Based Information Centre For Epidemiological Training And Surveillance
CLACC	Capacity Strengthening of Least Developed Countries for Adaptation to Climate Change
CMR	Consolidated Monthly Return
CO	Country Office
COP	Conference of the parties
CSDs	Climate Sensitive Diseases
DADM	Department of Aid and Debt Management
DDT	Dichloro-Diphenyl- Trichloroethane
DEH	Division of Environmental Health (Kenya)
DHF	Dengue Haemorrhagic Fever
DHMT	District Health Management Team
DMCC	District Malaria Coordinating Committee
DOMC	Division Of Malaria Control
DOMU	Disease Outbreak Management Unit
DoPH	Department of Public Health
DRM	Disaster Risk Management
E&HIA	Environmental and Health Impact Assessment
EA	Executing Agency
EH	Environment Health
EMS	Emergency Medical Services

ENSO	El Nino Southern Oscillation
EPR	Epidemic Preparedness And Response
EWARS	Early Warning and Response System
EWS	Early Warning System
FCCCT	Fiji Climate Change Country Team
FHSIP	Fiji Health Sector Improvement Program
FiNIPP	Fiji National Influenza Pandemic Plan
FMS	Fiji Meteorological Service
FSMed	Fiji School of Medicine
FSP	Full Size Project
GCM	General circulation models
GDP	Gross Domestic Production
GEF	Global Environment Facility
GHG	Greenhouse gases
GIS	Geographic information system
GLOF	Glacial Lake Outbursts and Floods
GoK	Government Of Kenya
HEADMaP	National Health Emergencies and Disaster Management Plan
HHWT	Household water treatment
HIMAL	Highland Malaria
HIS	Health Information Systems
HMD	Hydro Meteorological Disasters
HMIS	Health Management Information System
HRD	Human Resource Development
HRM	Human resource Management
HVP	Healthy Villages Program
ICIMOD	International Center for Integrated Mountain Development
ICT	Information Communication Technology
IEC	Information Education Communication
IFRC	International Federation of Red Cross and Red Crescent Societies
INC	Initial National Communications
IPCC	Inter-governmental Panel on Climate Change
IPT	Intermittent Presumptive Treatment
IR	Inception Report
IRS	Indoor Residual Spraying
ITN	Insecticide Treated Nets
IVM	Integrated Vector Management
IW	Inception Workshop

JPW	Joint Program Of Work
Kcal.	kilocalorie
KCO	Kenya Country Office
KEMRI	Kenya Medical Research Institute
KEPH	Kenya Essential Package In Health
LDC	Least Developed Countries
LDCF	Least Developing Countries' Fund
M&E	Monitoring and Evaluation
MARA	Malaria Risk In Africa
MDG	Millennium Development Goals
MERLIN	Medical Emergency Relief International
MoH	Ministry of Health
MSF	Médecins Sans Frontières International Homepage
NAPA	National Adaptation Programme of Action
NCCHAC	National Climate change Health Adaptation Committee
NCSA	National Capacity Self-Assessment
NDMO	National Disaster Management Office (Fiji)
NEMA	National Environmental Management Authority
NEP	North Eastern Province
NGO	Non-Governmental Organization
NHSSP	National Health Sector Strategic Plan
NMBP	National Malaria Business Plan
NMS	National Malaria Strategy
NPC	National Project Coordinator
NSAs	Non-State Actors
OCHA	United Nation Office for the Coordination of Humanitarian Affairs
OFP	Operational Focal Point
PACC	Pacific Islands Adaptation to Climate Change
PATIS	Public Health and Patient Information System
PCCAPHH	Piloting Climate Change Adaptation to Protect Human Health
PHED	Public Health Engineering Division
PIMIRA	Program-Linked Information Management by Integrating operations-Research Approach
PIR	Project Implementation Review
PIU	Project Implementation Unit
PSC	Project Steering Committee
RANET	Radio Internet
RCU	Regional Coordinating Unit

RGoB	Royal Government of Bhutan
RING	Regional and International Networking Group
RSPN	Royal Society for Protection of Nature
SCCF	Special Climate Change Fund
SEI	Stockholm Environment Institute
SOPAC	South Pacific Islands Applied Geosciences Commission
SP	Sulfadoxine-pyrimethamine
SPCZ	South Pacific Convergence Zone
SPREP	South Pacific Regional Environment Programme
STAP	Scientific and Technical Advisory Panel
SWAp	Sector-Wide Approaches
TB	Tuberculosis
TPR	Tripartite Review
TSP	Total suspended particles
TTR	Terminal Tripartite Review
UN	United Nations
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNFCCC	United Nation Framework Convention on Climate Change
USP	University of the South Pacific
VBDCP	Vector Borne Disease Control Programme
VHCs	Village Health Committees
VRA	Vulnerability Reduction Analysis
WHO	World Health Organization
WRM	Water Resource Management

## 1. Situation analysis

### 1.1. Climate change - induced problem

1. Understanding of the relationship between climate change and health impacts is improving rapidly. WHO estimates that by the year 2000, the climate change that had occurred since the mid 1970s was responsible for a net increase of over 150,000 deaths per year. These estimated health impacts are significant, comparable to those from outdoor air pollution in developing countries, and overwhelmingly concentrated in the poorest populations. The number of excess deaths is projected to approximately double by the year 2030. Although direct and immediate impacts such as deaths in heat waves and floods can often be dramatic and provoke immediate policy-responses, the most important long-term influences will likely act through changes in natural ecosystems and their impacts on disease vectors, waterborne pathogens, and contaminants. Reviewing these concerns overall, climate change has recently been identified as "the biggest global health threat of the 21st Century" (Lancet/UCL, 2009).

2. Climate change can bring additional health risks through three main mechanisms, acting either singly or in combination. Firstly, climate change can cause diseases to spread to new areas, increasing the number of people exposed. For example, increasing temperatures and precipitation in the tropical highlands are projected to increase the area that is ecologically suitable for malaria transmission, leading to spread of the disease to higher altitudes. Such shifts in disease distributions can have larger health impacts than would be expected from simple calculations of population exposed. Newly exposed populations are generally not protected either by disease control programmes, or by population immunity. Mortality rates can be up to 10-times greater during an epidemic among populations not regularly exposed to malaria than in areas with stable transmission. Older, more productive members of the community are more severely affected, amplifying the impacts of the epidemic on families and society, for example through disruption of agricultural production and therefore wages and household income. The mechanism of increasing population at risk applies to increases in range of malaria in Kenya, and malaria and dengue in Bhutan.

3. Secondly, climate change brings additional health burdens through increasing the frequency or intensity of health risks that already occur within a given population. For example, heatwaves already result in higher than average mortality in China. Increasing temperatures are likely to make heatwaves more frequent, and more intense, thereby increasing mortality. As above, these risks are likely to be greater than suggested by a simple calculation of the proportion of people exposed to heatwaves in a given year. Impacts are known to be higher in populations that have had limited exposure to the new conditions, or when heatwaves occur outside of time of year when they would usually be expected. The mechanism of increased frequency or intensity of existing risks applies to heatwaves in China and in Uzbekistan, hydrometeorological disasters in Fiji, Glacial Lake Outburst Floods in Bhutan, and diarrhoea in Bhutan and Uzbekistan. Each of the risks can be expected to impact differentially on sub-populations, with the poor, children and elderly at heightened risk for many health impacts, and with women and men affected differently (e.g. generally higher age-specific rates of cardiovascular disease in men, and in some cases, greater vulnerability to natural disasters among women).

4. Thirdly, climate change can create additional burdens of ill health because of the responses taken to address climate change-related risks in other sectors. For example, in many water stressed regions, it is expected that climate change would decrease precipitation, increase evapotranspiration, and increase the degree of water scarcity. This has prompted increased use of treated wastewater in agriculture. However, these projects are not taking into consideration that, unless appropriate standards and procedures are implemented and enforced, use of treated wastewater will increase the number of cases of diarrheal diseases. This mechanism applies to the increased use of wastewater in Jordan and Barbados, and increased storage of water, and thereby heightened risk of dengue transmission, in Barbados.

5. Climate change can increase disease burdens from what would otherwise be expected, even as the baseline burden of ill health decreases over time due to other factors, such as improvements in public health prevention, socioeconomic conditions, and technology. Currently, about 150,000 annual deaths are attributed to



climate change. The number of deaths attributed to climate change is projected to double by 2030. Combined with a decreasing baseline, this means that the proportion of total deaths attributed to climate change is projected to increase. Therefore, public health programs and activities will need to work harder to reduce climate-related burdens of ill health even as other factors work to reduce these burdens.

6. Global assessments indicate that the critical determinant of the degree to which climate hazards are translated into impacts on human wellbeing is the resilience of the health and related sectors to deal with climate-related diseases. This relates both to general capacity (e.g. as shown by generally higher disease rates in countries with lower investment in health) (McMichael et al., 2004), and in terms of the presence or absence of long-term planning conferring the flexibility to deal with extreme, unprecedented, or rapidly changing health risks (e.g. lack of preparedness contributing to over 70,000 deaths in the 2003 European summer heatwave)(Robine et al., 2008). Vulnerability and adaptation assessments have identified health as a critical issue in several countries, e.g. (Bhutan Government, 2000; Fiji Government, 2005), often pointing out that further work is needed to identify and implement effective responses. However, the health community has generally not invested sufficient resources or time on examining how current policies and practices can be modified to reduce anticipated climate change-related health impacts. The public health community has also not worked systematically integrating climate change considerations into operational health plans. In short, although there has been related improved understanding of health risks associated with climate change over the recent years, there has been limited identification and implementation of strategies, policies, and measures to protect the health of the most vulnerable populations.

#### ***Climate Change: Forecasted Threats and Impacts***

7. The UNFCCC (United Nations, 1992) identifies the avoidance of adverse effects on human health as one of its core principles. The critical determinant of the extent to which climate hazards translate into health impacts will be the resilience and preparedness of health and related sectors. The global health community has recently committed to engage strongly in adaptation, through a resolution and workplan approved by the World Health Assemblies of 2008 and 2009(WHO, 2008a; WHO, 2008b). There is a commitment to work cross-sectorally and within the framework of the UNFCCC to, inter alia, "Strengthen health systems to cope with the health threats posed by climate change, including emergencies related to extreme weather events and sea-level rise". This type of cross-sectoral approach will be critical in the context of anticipated climate change related health impacts—a flavour of which is presented below in the context of the 7 countries participating in this proposed global programme.

#### **Country Selection**

Seven countries were selected to participate in this global project so as to maximize the opportunities for learning internationally relevant lessons to increase the adaptive capacity of the public health community. The selection process identified countries which each 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.

The selection was carried out through a structured process. First, WHO- HQ defined 3 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 consulted with the environmental health focal points in each of its 6 regional offices, asking them to propose 1-2 countries in their region meeting each of the individual conditions above. From these, WHO-HQ assembled an

initial list of 6 candidate countries (Barbados, Fiji, Jordan, Uzbekistan, Bhutan and China). Third, WHO-HQ consulted with UNDP/GEF and UNDP regional offices, to confirm that the countries proposed by the health sector were also 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 can be grouped into the following categories of vulnerability:

- 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 later selected through the vulnerability review and stakeholder consultation process outlined in the UNDP's Adaptation Policy Frameworks, and are :

- 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.

### **Barbados**

8. 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 in Barbados. 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 findings of the reports are summarized in Annex 1.1).

9. Climate change is likely to threaten fresh water resources in Barbados through (i) rising sea levels that in turn will increase salt-water intrusion into freshwater aquifers; and (ii) increased frequency and severity of droughts that is likely to intensify over the coming decades (Barbados INC 2001). Vulnerability to fresh water constraints is acute as Barbados is almost entirely dependent on groundwater supplies. With available per capita natural water resources estimated at 350 m<sup>3</sup> per person per year, Barbados is classified as a water scarce country (Reid 1994). Vulnerability is compounded as the groundwater aquifers are unconfined and hydraulically connected to the sea. 86.4% of the island's drinking water comes from three coastal catchments, the St. Michael Catchment (52.8% of total), the St. Philip Catchment (20.2%), and the West Coast Catchment (13.4%). The wells of the West Coast Catchment are, on average, 992.80 m away from the sea, with water levels about 0.3 m above sea level on average. Therefore, these catchments are at the most risk for saline intrusion. In a situation with increasing drought, lack of rainfall and saltwater inundation would increase adverse health outcomes associated with water scarcity, particularly waterborne diseases, and vectorborne diseases due to changes in water storage practices.

10. Key health concerns related to climate change include 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 are anticipated. Health risks are considered likely through direct climate effects on disease risks, i.e. insufficient supplies of freshwater and increase transmission of waterborne diseases such as salmonella, giardiasis,

and amoebic dysentery. They are 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 induced stress on groundwater resources increases 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**

11. Bhutan suffers from high rates of a series of climate-sensitive health burdens. Projected temperature rise (higher in mountainous areas than elsewhere in the world) is considered likely to increase the probability of glacial lake outbursts and floods (GLOF). It is also projected to increase in the geographic range and incidence of a range of vector-borne diseases particularly malaria and dengue fever in addition to increases in the geographic range and incidence of diarrhoeal diseases. Increasingly variable precipitation is likely to increase risks of flash floods, and in turn lead to the spread of diarrhoeal and vector-borne disease.

12. Two types of malaria are prevalent in Bhutan: the more severe *Plasmodium falciparum* (30-60% of cases) and *Plasmodium vivax*. Over 50% of the population resides in malarial areas. In addition, populations in non-malarial areas can be exposed due to the increasing population mobility. Analysis of local data showed that both temperature and rainfall are significantly associated with malaria, but only temperature is significant when both weather variables are entered into the analysis. This suggests that temperature is the major limiting factor in the current geographic distribution of malaria in Bhutan. Populations at the altitudinal edge of the malaria distribution are particularly vulnerable to increasing risk of epidemics as temperature increases. Case fatality rates can be up to 10-times greater during an epidemic as opposed to stable transmission.

13. The number of cases increased from 518 in 1964 to a maximum of 39,852 in 1994, with increasing prevalence of *falciparum* malaria. More than 90% of malaria cases are reported from the five endemic districts of Sarpang, Samtse, Samdrupjkhonkhar, Chukka, and Zhemgang. Seasonal transmission occurs in the riverine valleys of Trashigang, Trongsa, Tsirang, Dagana, Punakha, Wangdue, Pengatsel, and Thimpu. More than 80% of endemic cases come from the Sarpang and Samdrupjkhonkhar districts. Since 1999, the number of people sleeping under insecticide-treated bednets has increased, resulting in a reduction in malaria incidence. There were 1825 cases of malaria in 2005.

14. Dengue fever is an important emerging infectious disease in Bhutan. Although the vectors for dengue, *Aedes aegypti* and *Aedes albopictus* have been known to exist in the southern region, 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.

15. In Bhutan, diarrhoeal disease continues to be a major problem affecting the survival of the children in this country. Diarrhoeal disease has remained one of the top three causes of morbidity in Bhutan for the last decade and contributes to about 10-15 % of the morbidity cases. Diarrhoeal diseases of bacterial or protozoan aetiology (the dominant type in developing countries) are known to peak during the hottest months of the year and this pattern occurs in Bhutan. There is a gradual increase in the diarrhoeal episodes from the month of April to June and then the trend goes down, likely reflecting seasonal variation in temperature and precipitation. Climate change could also influence water resources and sanitations either due to flooding (melting of snows and heavy rainfall) or due to drought.

### **China**

16. Beginning in 2005, the Institute for Environmental Health and Related Product Safety, China CDC, and the World Health Organization (WHO) have begun a process of assessment of health risks from climate change in China. This has now included an international workshop (2005), a health component within an MDG-F project on climate change in China (2008), and a national conference on climate change and health (2009). Key health concerns identified during this process include the consequences of heat waves on respiratory and cerebro-cardiac

diseases, floods and droughts, changes in the geographic range and incidence of malaria, dengue fever, schistosomiasis, and other vectorborne diseases, and the consequences of decreased crop yields.

17. Following the global inception meeting for the current project, a national meeting was organized by Ministry of Health to form the National Steering Committee (see above). The National Steering Committee highlighted two main priority risks. Firstly, cerebro-cardiovascular and respiratory diseases associated with heat waves. 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 labour force loss from these diseases is more than US\$2,500 million per year.

18. Stakeholder consultations in China led to cerebro-cardiovascular and respiratory diseases being selected as the project focus, due to their ranking as the highest contributor to mortality, and the rapid increase in other vulnerability factors. They include a rapidly ageing population with high levels of CVD, high rates of urbanization (contributing to the urban heat island effect on top of gradual climate change), and persistent high levels of urban air pollution, which interact with elevated temperatures to increase mortality.

19. Many cities in China experience severe heatwaves, (i.e. temperatures exceeding a pre-defined temperature threshold for a determined period), and death rates are elevated during these periods. Figure 4 shows the increase in all-cause mortality in Shanghai during a heat wave (defined as Tmax over 35°C) in 11-17 August 1998. The frequency of extremely hot summers appears to be increasing. 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 is expected during summer periods. Mortality was particularly high among those 60 years of age and older. Heatwaves also present risks to infants. Climate change is projected to increase the frequency and intensity of heatwaves, as well as the number of hot days during the summer. This would increase morbidity and mortality unless effective adaptation measures are implemented to prepare the population. Increasing humidity would further increase the impacts on health.

#### Fiji

20. Assessments carried out for the national communication and work undertaken during the preparatory stage of this project concluded that Fiji has high baseline vulnerability to a number of climate-sensitive health impacts. These include the direct health impacts of hydrometeorological disasters such as floods and storms, as well as vector-borne and water borne diseases (dengue and diarrhoea) that associated with weather extremes, and with gradually increasing temperatures. Remote areas in Fiji are also considered vulnerable to nutrition-related health impacts, particularly during droughts.

21. The first outbreak of the most severe form of the disease Dengue haemorrhagic fever (DHF) occurred in 1975, with subsequent outbreaks in 1979-80, 1989-90 and 1997-98. The 1997-98 outbreak of DF/DHF was explosive with 24,000 cases and 13 deaths, and spread to rural areas. Fiji experienced another outbreak in 2002-2003. These outbreak years were reported by the Fiji Meteorological Services as El Nino years, with elevated temperatures.

22. Projected changes in dengue-fever epidemics were modelled using PACCLIM, an integrated assessment model for the Pacific Island countries (PICs) that assists with assessments of the impact of climate change and sea level rise. It was found that climate change, through increasing temperature, would lead to increases in the risk of dengue-fever epidemics. These findings suggest that climate change could result in an increase in 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 include Suva and Rewa in the Central Division, Lautoka, Ba, Nadi, Nadroga and Ra in the Western Division, and Macuata in the Northern Division.

23. Diarrhoeal diseases remains a leading cause of mortality and morbidity in Fiji, particularly among younger age group. Studies using Fijian data show that elevated temperature, unusually high or unusually low rainfall are all associated with statistically significant increase in diarrhoea (Singh et al., 2001). Fish poisoning is an important subset of diarrhoeal disease in Fiji, and is also associated with climate, with higher incidence in El Nino years (Figure 7). Diarrhoeal disease may become more common if Fiji becomes warmer and wetter (as projected by the CSIRO scenario) and if droughts and tropical cyclones occur more frequently, disrupting water supplies and sanitation systems. Areas vulnerable to diarrhoeal diseases include Suva, Nadi, Ba Lautoka, Ra, and Macuata.

24. Weather extremes are known to lead to nutritional impacts in Fiji. The OCHA report on the 1998-1999 drought reported that the incidence of anaemia increased amongst pregnant women in the hard hit Western Division. This was a clear indicator of micronutrient deficiencies, which were also prevalent amongst school children. Nutrition-related illnesses are most likely to be affected by increases in the frequency and/or magnitude of tropical cyclone and drought events. Further, it is also likely that if climate change leads to economic and social disruption and environmental degradation, disadvantageous effects on health may be serious. Communities vulnerable to nutritional diseases due to water stress include those from the western side of the major island Viti Levu, the Northern Division and smaller islands in the Eastern Division.

#### **Jordan**

25. Monitoring data from the Jordanian meteorological agency show increases in the magnitude and frequency of extreme temperatures. Climate change is projected to result in higher temperatures and lower precipitation in Jordan. Based on current and projected climate changes, and the known environmental stresses on health, the steering committee and stakeholder workshop identified climate change-related increasing water scarcity, and its secondary effects, as the highest priority threat to health within Jordan.

26. Jordan is ranked among the poorest countries in the world in water availability, with a current per capita availability of 75 L/day, already 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 (Abdulla, 2003), which will reduce 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.

27. The heavy and increasing use of treated wastewater in Jordan occurs in a manner that is considered to pose potential risks to human health. Unless new adaptive measures are implemented, this change in the water strategy will cause direct and indirect health risks to the population. International and local studies show that increasing use of wastewater in agriculture, driven partly by climate change, will increase health risks including via the consumption of or exposure to pathogenic microorganisms, heavy metals, harmful organic chemicals such as endocrine disrupting compounds and pharmaceutically-active compounds. Analysis of the available data in Jordan give 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. diarrhoea and nematode worms) than those reported for the rest of the country.

28. The assessment further highlighted key vulnerable populations, including farm workers, their families, neighbouring communities and the consumers of the crops. Geographic locations downstream of wastewater treatment plants include the part of Zarqa River from the Assamra wastewater treatment plant to King Talal Reservoir, and from the KTR outflow to the point of mixing with water coming from King Abdullah Canal (Yarmouk river water), at Abu Al Zeighan near Deir Allah.

#### **Kenya**

29. Initial scoping of the current impact and climate-sensitivity of health issues in Kenya highlighted (i) malaria in highland areas, (ii) water-scarcity and diarrhoeal disease, and (iii) health impacts of acute drought and floods, as priorities. The cross-sectoral group made the decision to focus on malaria based on its leading position in burden of disease within Kenya, the clear evidence of sensitivity to climate variability and strengthening evidence of

effects of climate change, and the existence of strong intervention programmes that require reconsideration due to the additional challenge of climate change.

30. Approximately 20 million people (70% of the population) in Kenya are at risk of malaria. In areas where disease transmission occurs throughout the year, about 25% of all outpatient attendance and over 40% of hospital admissions in children under the age of five are malaria related. 6,000 pregnant women suffer from malaria-associated anaemia annually and about 4,000 babies are born with low birth weight as a result of maternal anaemia. 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; this is about 93 deaths daily (MoH Report, 1998; National Malaria Strategy 2001– 2010).

31. While communities living at low altitudes are more vulnerable to stable malaria transmission, those above 1,100 meters are more vulnerable to malaria epidemics (i.e. rapid increases in transmission). When conditions are suitable for transmission, the low level of immunity within the population means that disease spreads rapidly and tends to cause more severe illness (Kiszewski and Teklehaimanot, 2004). There is accumulating evidence that both climate variability and change (along with other factors) are favouring malaria epidemics within the Kenyan highlands (e.g. (Pascual et al., 2006)).

32. This is supported by a strong evidence base from the international literature, showing that warmer and wetter conditions contribute to increased vector biting, enhanced development rates of parasites and vectors, and ultimately an increase in entomological inoculation rates (number of infective bites per person per unit time). Associations between the EL Niño Southern Oscillation (ENSO) Index and malaria cases or mortality rates have also been shown in multiple studies in South America and Asia, as well as Africa (see National Project 6 and (WHO, 2005) for a full review).

33. Within Kenya, the first major malaria outbreaks in the region west of the Rift Valley (Uasin-Gishu, Trans-Nzoia, and Nandi) were recorded in the 1920s. Epidemics continued until the 1950s. Malaria was successfully controlled in the highlands of Kenya in the 1950s to 1960s. A 1929 analysis (Campbell, 1929) analysis of rainfall and climate data for Eldoret provided the first indication of a linkage between rainfall variability and epidemics. More recent evidence shows that the climate links persist. In Trans-Nzoia and Uasin-Gishu, the first documented epidemic occurred in June 1988 although, following a period of heavy rainfall, which had been preceded by a two-year period of relatively dry conditions (Ngindu et al., 1989). Analysis of the epidemic following the 1997/1998 El Niño indicates that the malaria epidemic months corresponded with the onset of unusually high short rains, preceded by a season of unusually high minimum temperatures; the mean monthly minimum temperatures increased 2.2 - 4.5°C between January and March 1997 and 1.8 - 3.0°C between February and April in 1998 (Wandiga et al., 2004). These weather conditions are experienced irregularly, depending on the location. Previously malaria free areas are now recording annual epidemics soon after the long rain season. Approximately 20 million Kenyans are currently at risk of malaria (Craig et al., 1999), with the percentage expected to increase as climate change facilitates transmission at higher altitudes within the highlands.

34. Malaria transmission in the East African highlands is typically highly seasonal, with cases lagging behind the variation in rainfall in particular (see figure 10 and 11). There is also marked variation in cases between years, associated with the closely inter-correlated variables of precipitation, temperature, and humidity. This indicates that (i) malaria cases are likely to be affected by climate change, (ii) that control interventions could be improved by taking better account of both seasonal and inter-annual variation in malaria risk, driven by climate variables.

### **Uzbekistan**

35. Reviews and data analysis carried out during the preparatory phase show strong evidence that climate-sensitive diseases continue to exert a large toll on the health of the population of Uzbekistan, and vary markedly with climate variability. The major concerns identified during the assessment are the high and increasing burden of cardiovascular disease, persistent high levels of diarrhoeal disease, respiratory illness, and health effects from dust storms. Each of these also shows high sensitivity to climate variability. For example, the burden of diarrhoeal disease is 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 (WHO, 2006a). Diarrhoea cases are many times higher in the summer than winter months, and preliminary unadjusted analyses of the seasonal pattern indicate that cases increase by 10-13% increase for every one degree Centigrade increase in temperature (Figure 12). Diarrhoea is also highly sensitive to the availability of water. All of the highlighted diseases indicate similar capacity for climate change to bring about significant health impacts, if adaptive measures are not implemented.

36. Previous international assessments of climate change impacts, for example by the WHO and the Intergovernmental Panel on Climate Change (IPCC), (Confalonieri et al., 2007; McMichael et al., 2004) focused on the relationships between weather and health outcomes, and how those risks could change with climate change, rather than on evaluating and implementing response measures. In addition, the health sector in the poorest and most vulnerable countries has historically concentrated on reactive responses, such as disease treatment. It has had little capacity or incentive to consider how to develop long-term approaches to reduce projected future risks or to work with other sectors. This is a dangerous situation, running the risk that potentially effective health adaptation options remain unidentified, unimplemented, or worse, are implemented too late. It is well known that emergency response is often more expensive and less effective than preventive action. Developing effective strategies to adapt to climate change requires long term planning processes to mainstream considerations of climate variability and change within the health and related sectors. While most countries are starting to consider these risks in their planning, the design of long term response options is still limited.

## 1.2. Root causes

37. There are a number of underlying reasons as to why there has been limited progress made in terms of the identification and implementation of strategies, policies, and measures to protect the health of the vulnerable populations in countries<sup>2</sup>. The reasons are many and often context specific. The discourse below highlight a few broad thematic areas that emerged during the formulation phase in the countries participating in this pilot programme.

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

38. Baseline quantitative indicators of health indicate, for example, that over 25% of all deaths and illnesses in Africa are caused by diseases that are strongly sensitive to climate (WHO, 2004b). The incidence rates of climate-sensitive disease are high in especially vulnerable countries throughout the developing world. The baseline also takes into account the level of climate hazard, as measured by current exposure to climate stresses (such as heat waves, floods, or droughts) and by the potential incremental effects of climate change in the absence of specific adaptation measures. The most comprehensive assessment of climate change effects on health concluded that by 2030 in developing regions, unmitigated climate change without specific adaptation measures is likely to increase the incidence rates of diarrhoea, dengue fever, and malaria by 10-20% (driven by increases in temperature and changes in precipitation favouring survival and reproduction of disease pathogens and their vectors), and to increase the incidence rates of deaths and injuries from inland up to five-fold (driven by projected changes in the frequency of extreme precipitation events) (McMichael et al., 2004).

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<sup>2</sup> Conceptual frameworks have recently been developed to promote climate change adaptation, such as the "Adaptation Policy Frameworks" (APF) developed by UNDP and partners (UNDP, 2003), and the 'Methods of assessing human health vulnerability and public health adaptation to climate change'(Kovats et al., 2003b) developed under the direction of WHO. Together these two publications provide a systematic approach to formulating a project to build capacity for adaptation to climate change in the health sector. These publications have guided the analysis of the baseline situation in each country, described in Annexes 1.1 to 1.7.

*(a) Relatively recent appreciation of the links between climate change and health*

39. The coverage of health in the National Communications of Non-Annex 1 countries, including the project countries, generally describes multiple risks to health, but rarely describes potential adaptive responses in sufficient detail for implementation of actions (Kovats et al., 2003a). Health sector investment and efforts remain overwhelmingly focused on reactive measures, for example, insecticide-spraying and drug treatment in response to vectorborne disease outbreaks. In the absence of this project, the health sector will continue to pay little attention to working with other sectors to promote the long-term preventive actions that could reduce health vulnerability to climate change, such as developing early warning and response systems in regions where climate change could facilitate the spread of infectious diseases (such as the malaria early warning system proposed for the highlands of Kenya) or incorporating health issues into adaptation measures implemented in other sectors (such as ensuring that use of treated wastewater does not increase the incidence of diarrheal diseases, as proposed for Jordan and Barbados). If this situation continues, vulnerable populations will be exposed to potentially avoidable climate risks to health.

*(b) Existing public health related policies and practices do not reflect specific response needs for managing climate change-related health impacts*

40. An additional dimension relates to the current attitudes and behaviours of stakeholders. As a generalization, stakeholders in many vulnerable countries appreciate the threat and the need to adapt over the long-term, but lack knowledge or incentives to alter behaviour to reduce vulnerability. This situation is reflected in Government decision-making structures that are sectoral, and which give few incentives for intersectoral work. The health sector has, therefore, rarely made the necessary interconnections with other sectors to select and implement effective adaptation policies.

41. The preparatory phase assisted vulnerable countries in carrying out individual assessments; identifying specific opportunities for integrating climate change adaptation into the operations of health systems and related sectors; and choosing high priority interventions. The necessary next steps are to remove the institutional, financial, and sectoral barriers to ensure effective provision of information and development of response plans, pilot interventions, and share lessons across participating and other vulnerable populations.

42. Assessments undertaken during the preparatory phase also identified a lack of awareness and training on the impacts of climate change on health, meaning that in the baseline situation, the capacity of healthcare agencies to modify their policies and practices would be constrained. Without the GEF project, necessary changes in healthcare procedures would not be supported either by healthcare professionals or, more significantly, by the general public, such that by the time the need for changes was clearly recognized, the costs would have increased dramatically.

43. In building support for interventions to address climate-related health issues, and enhancing awareness of the problems, one of the most valuable tools is the demonstration value of pilots. In the absence of the GEF project, no such pilots would occur, meaning that innovations would not be identified, and support for further action would not be forthcoming.

*(c) The absence of integrating climate change considerations into operational health plans by the public health community.*

44. In all seven countries, baseline analyses highlighted that climate change would cause illness and death in addition to current baseline pressures, and would stretch the current capacity to prevent and control these health issues. In the absence of any additional intervention, current disease control programmes within countries will not be equipped to cope with the increased risks associated with climate change. In particular, the current disconnect in most countries between health monitoring and climate monitoring would mean that the incidence of climate-induced health risks would not be predicted, reducing the potential to avoid incidents of disease outbreaks or climate-related health disasters. Furthermore, as the relationships between climate and health drivers change, the current ability to predict health problems would be eroded, leading to ever more severe health problems.



(d) *Insufficient intra- and inter-country learning within and between key institutions that matter in addressing climate change health concerns.*

45. Finally, many countries face similar climate-related health issues. For example, the spread of vector-borne diseases, problems associated with water quality and quantity, and the incidence of climate-induced disasters are applicable in many countries. Building adaptive capacity to manage such problems can benefit from lessons learnt in other countries. In the absence of any targeted intervention, the potential to learn and adapt lessons from other countries would be severely limited, which would constrain the implementation of improved policies and practices in every country.

### **1.3. Long-term solution and barriers to achieving the solution**

46. The normative (*preferred*) situation requires relevant authorities at the national and sub-national level to be better capacitated to predict climate change related health impacts, factor climate change risks in health management decision-making processes, test specific management practices as well as share lessons learned. In this context, critical barriers that this project seeks to overcome include the following:

- a. *Absence of functional monitoring systems of climate change sensitive health risks;*
- b. *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;*
- c. *Poorly informed/trained health managers at the district and central level;*
- d. *Insufficient investment in testing specific measures to manage climate change-sensitive health risks;*
- e. *Optimizing within- and cross-country learning on managing emerging climate change related health risks;*

47. The above key barriers emerged from an in-depth analysis of the baseline situation in each of the pilot countries during the preparatory phase.

#### **a) Barbados**

48. The Ministry of Health Strategic Plan for Health for the period 2002-2012 forms the basis of health policy in Barbados. There are specific goals for each strategic direction. With regards to health systems, the overall goal is to improve health systems to deliver efficient, effective and quality of services. In the area of institutional health services, the strategic goal is appropriate services developed, improved, and maintained with a health promotion framework. For family health, the goal is to improve the health and quality of the populations. In the area of food and nutrition, the goal is to improve the physical and nutritional state of the population. With regards to chronic non communicable disease, the goal is to reduce the morbidity and mortality due to chronic non communicable diseases. For HIV/AIDS, the goal is the reduction in the incidence and prevalence of HIV/AIDS. For communicable diseases, the goal is to reduce morbidity and mortality. In the area of mental health, the goal is to improve the mental health of the population. For health and the environment, the goal is to reduce environmental health risks. In the area of human resource development, the goal is to have the appropriate human resources available to support the health system

#### **b) Bhutan**

49. Modern medical care in Bhutan began in the early 1960s. Since then, the Royal Government has provided free health care services. The national health policy is to provide an integrated, equitable, cost-effective, and well-balanced health service to all-Bhutanese. There are 29 hospitals, 176 basic health units, and 476 out-reach clinics. There are about 143 medical doctors, 598 health workers, 395 nurses, 438 technicians, and 70 indigenous physicians. In addition, there are 1,200 active village health volunteer workers who assist the health workers.

50. In 1999, Bhutan launched “Bhutan 2020 – A Visions of Peace, Prosperity and Happiness” articulating the country’s aspirations for sustainable and equitable economic growth and development, without compromising the natural resource base for future generations. Bhutan places high priority on achieving the Millennium Development Goals, including Combat HIV/AIDS, Malaria, and Other Diseases, Reduce Child Mortality, and Eradicate Extreme Poverty and Hunger. Climate change is not currently reflected in national health strategies and plans, and will likely make achievement of these goals more difficult.

51. However, climate change threats to health are clearly recognized as an issue in Bhutan's INC, which states "A predicted temperature increase of 2.0C is likely to affect human health not only because of heat stress but also because of increased outbreaks of vector-borne diseases. Similarly, an increase in rainfall and flooding, which provide favourable conditions for water-borne diseases, also can increase our vulnerability to health hazards ... Another significant climate change-related health concern is the increase of waterborne diseases such as gastroenteritis and diarrhoea, which are identified with poor water quality and turbidity during rainy seasons." Several of the most important health vulnerabilities to climate change result from incomplete integration of health protection measures in policies or developments by other sectors, due to lack of financial resources or institutional barriers.

#### **c) China**

52. The National Institute of Environmental Health and Related Product Safety (NIEHS) at Chinese Center for Disease Control has the responsibility to design and implement policies and measures to reduce vulnerability to climate change. So far, few policies or regulations on climate change and health have been developed.

53. Chronic diseases control and prevention has attracted great attention in China and the MoH has highlighted research on cerebro-cardiovascular diseases control and prevention in the national "eleventh five-year" plan. The MoH is responsible for improving and perfecting primary health care and health promotion, and making it available for all.

#### **d) Fiji**

54. Health care is financed mainly by general taxation. The Government has been allocating about 8%-10% of total public expenditure for health care for the last 10 years. Total health expenditure is 3% of GDP, which is the lowest rate in the Pacific. Although the government budget for health care has been increasing each year, total health expenditure in terms of percentage of GDP has not increased. Of the appropriated allocation, 62%-67% is spent on personal emoluments at divisional and sub divisional hospitals, with approximately 7.5% allocated to drug procurement. Out-of-pocket payment for health care is estimated at 35% of total health expenditure, mostly in the private health sector.

55. Fiji has a well developed health system with an infrastructure of base hospitals in three geographic divisions, supported by area and sub-divisional hospitals, health centres, and nursing stations in the smaller towns and rural and remote areas. The Ministry of Health underwent a Health Reform programme in 1999-2003 where the divisional health management structure was reviewed and strengthened to support the now decentralized health service structure. Basic health care is provided to all residents through a hierarchy of village health workers, nursing stations, health centres, sub divisional hospitals and divisional and specialized hospitals.

56. The need to address health issues under conditions of climate change is evident from Fiji's INC, which states "Climate change could result in an increase in the frequency of epidemics, a change in the timing (seasonality) of epidemics so they may occur in any month, a larger number of people being affected by each epidemic, ... dengue becoming endemic (occurring all the time) rather than occurring in epidemics, diarrhoeal disease becoming more common if Fiji ... [and] droughts and tropical cyclones will occur more frequently, disrupting water supplies and sanitation systems". This project will necessitate the formation of new intersectoral arrangements, as described in Annex 1.4. The key responsible government agencies for this project are the Ministry of Environment, National Disaster Management Office (NDMO), the Fiji Meteorological Services (FMS), The Department of Town Planning under the Ministry of Local Housing, The Department of Mineral Resources, and Department of Water Supply under the Ministry of Works and Public Utilities. Other agencies that were actively involved during project design and that can provide specific services include SOPAC, USP, and other NSAs.

#### **e) Jordan**

57. The national health strategy and policy for the Jordanian health sector is defined by the Higher Health Council, headed by the prime minister. The Ministry of Health takes the lead role in defining technical content of health policy, and in making recommendations on health relevant policies in other sectors. It is also responsible for almost all preventive interventions within the health sector, although other agencies provide important specific

services under the direction of the MoH, for example monitoring environmental pollution, and providing curative services through private hospitals.

58. The relevant lead agency for managing health risks caused by increased use of wastewater as a consequence of climate change is the Environmental Health Directorate (EHD), which is tied to MoH's Undersecretary Assistant for Primary Healthcare Affairs. These include monitoring of drinking water quality, control of industrial pollution and hazardous waste, control of the reuse of wastewater, development and updating of relevant legislation, training of Environmental Health technicians and inspectors, collaboration with national and international governmental & non-governmental agencies (Jordan MoH, 2006).

59. Governmental agencies that directly or indirectly related to the health sector include Ministry of Environment (MoE), Ministry of Water and Irrigation, Ministry of Energy and Minerals, Ministry of Interior, Ministry of Agriculture, Department of Customs, Ministry of Industry and Trade, Institute of Standards and Metrology. Relevant non-governmental agencies include universities and the Royal Scientific Society (RSS), which supply important needs in for example, environmental and health research, and in the monitoring of pollution. Relevant international organizations include WHO on technical guidance regarding health protection, UNEP with regard to environmental monitoring, UNDP with regard to development projects. Bilateral donors support both relevant technical projects (e.g. GTZ has important projects on wastewater re-use in general), and infrastructure and financial support (e.g. USAID provides significant support to the water sector).

#### **f) Kenya**

60. The key responsible division in the Government of Kenya (GoK) is the Division of Environmental Health (DEH), who works in collaboration with the Division of Malaria Control (DOMC), Disease Outbreak Management Unit (DOMU), and other National stakeholders. DOMU works with the National Disaster Operations Centre under the Office of the President, providing the link between the MoH and other Government structures. The responsibility of detecting, preparing, and responding to malaria epidemics is through DOMC, in partnership with district and national level NGOs with relevant expertise, including MSF (France, Belgium, and Holland), MERLIN, and the International Red-Cross. Kenya Medical Supplies Agency (KEMSA) is mandated by the NMS to retain 20% of the national buffer stock of SP treatment in readiness for emergency use during epidemics.

61. The formal health care plan includes volunteer community health workers whose main obligation is providing health messages. They also initiate the referral systems for cases that deserve attention at the dispensaries. For the purposes of this project, the levels of care and the classification of the facilities by the Ministry of Health are:

Level 1: Dispensaries and clinics;

Level 2: Health centres and sub-health centres;

Level 3: District hospital and sub district hospitals;

Level 4: Provincial hospitals; and

Level 5: Referral hospitals.

#### **g) Uzbekistan**

62. Laws having direct or indirect relation to health care sector are debated within the Labour and Welfare Committee of the Parliament. The Ministry of Finance compiles the budget to be approved by Parliament and allocates funds to the regions, including funds for health care services and capital investments in the sector. The Ministry of Health develops health-care legislation and regulations, sets quality and quantity standards for the health services, monitors the quality of the services, identifies priorities for medical research, monitors public health status, develops curricula for training of health professionals, issues licences and certificates to providers of health care services and coordinates international medical aid.

63. The primary responsibility for enforcement of the sanitary norms lies with the Department of Sanitary Epidemiological Supervision under the Ministry of Health. The department monitors and controls sanitation and infectious disease status and supervises all sanitary-epidemiological institutions. The same structure and division of responsibilities exists at oblast (province) and rayon (district) levels. This large network monitors and enforces health standards in food and water quality, and regulatory standards in public institutions, as well as new

infrastructure and other development initiatives. The Research Institute of Sanitation, Hygiene and Occupational Disease is responsible for developing and updating technical sanitation norms and standards.

64. The management of the local health care system is carried out by local governing authorities – khokimiats of provinces (and districts) with respective medical departments. The Ministry of Health is responsible for supervision of overall policy and policy implementation by the local branches of the health care system, principally the branches of the State Emergency Care Centers, primary health care services, hospitals and training centres.

65. According to a survey undertaken in 1999, at least 45 NGOs are engaged in health-related activities. NGOs are rarely officially regarded as partners in social sector development and therefore technical coordination between the governmental and the voluntary sectors is limited.

66. Although the specific drivers of different health issues will be diverse, the general approach will be replicable across many health issues based on experiences generated by the project. In addition to improving the capacity in institutions responsible for health care, the project will also improve knowledge and understanding of the impacts of climate change.

#### 1.4. Stakeholder baseline analysis

67. Project preparatory activities convened in each of the pilot countries prior to and during the preparatory phase brought together a wide range of stakeholders, including representatives of Health Ministries, disease control practitioners, and personnel from related fields such as climate prediction and disaster response. Local stakeholder consultations provided details on anticipated priority health impacts and adaptation strategies, policies and measures that needed to be incorporated into the project design (See details in Annexes 1.1 to 1.7).

68. A number of stakeholders were involved in the preparatory phase. Stakeholders consulted including those who will also have a role in the implementation of the full project are outlined below.

##### **Barbados**

<i>Organization</i>	<i>Primary Responsibility</i>
<b>Ministry of Health</b>	Implementation and monitoring of public health measures
<b>Pan American Health Organization</b>	Regional health organization. Representative of WHO in the Caribbean
<b>Ministry of Environment</b>	UNFCCC focal point
<b>Barbados Water Authority</b>	Responsible for distribution of water in Barbados. Provision of data
<b>Meteorological Office</b>	Climate observation and projections
<b>Ministry of Economic Affairs</b>	Lead agency on Economic Affairs and Planning
<b>Ministry of Public Works</b>	Responsible for water drainage and other public health measures
<b>University of West Indies</b>	Regional educational and research institution
<b>Ministry of Tourism</b>	Lead agency on tourism
<b>Ministry of Agriculture</b>	Lead agency of agricultural production and safety
<b>United Nations Development Programme</b>	Regional UN focal point

##### **Bhutan**

<i>Institution</i>	<i>Primary Responsibility</i>
<b>Ministry of Health</b> Health care Division, DMS Environmental Health, DoPH, PHED, MoH, VDCP, RRU, DoPH Environment Health Program, DoPH, HRD, HRM	Lead Role in defining health prevention policy, implementation and monitoring of health standards
<b>Ministry of Finance</b> DADM	GEF operational focal point, allocation of funding to health and other sectors
<b>Ministry of Home and Cultural Affairs</b> Department of Local Governance (DLG)	

Ministry of Education	Lead role in community and other education programmes
National Environment Commission (NEC)	Lead role in environment policy, including climate change
Royal Society for the Protection of Nature (RSPN)	Environmental protection, and preparation of previous CLACC report on climate change and health in Bhutan
UNDP Country Office	Technical support and consultation
WHO Country Office	Technical support and consultation

## China

<i>Organization</i>	<i>Primary Responsibility</i>
Ministry of Health	Implement and monitor public health measures in the community
China Center for Disease Control and Prevention	Draft project proposal Implement, monitor, and assess the project adaptive measures
WHO	Technical support and consultant
UNDP focal point	Technical support and consultant
National Development Reform Committee	Government support
National Meteorological Bureau	Climate observations, issue warnings, work with other sectors on climate and climate change issues
Ministry of Science and Technology	Government support
Radio Broadcast and Television Bureau	Disseminate and spread information on climate-related risks, the health impacts of climate change, and self-protection
National and local newspapers	Disseminate and spread information on climate-related risks, the health impacts of climate change, and self-protection
Ministry of Finance	Government support
Local governments, including health, meteorological, education, transportation, and finance departments	Organize and implement the adaptive measures in communities, including health education, health consultation, respond to emergencies, etc.
Ministry of Construction	City planning of construction
State Environmental Protection Administration	Policies for climate change mitigation
Ministry of Labor and Social Security	
China Red Cross Society	Medical emergency support during heatwaves
Ministry of Civil Affairs	Help to organize residents in community
China Charity Society	Material and financial support
Ministry of Education	Health education
Ministry of Transportation	Provide transport in emergencies

## Fiji

<i>Organization</i>	<i>Primary Responsibility</i>
Ministry of Health	Implement and monitor public health measures in the community  Recommendations on new developments and infrastructure, drainage etc
Department of Environment	Focal point for UNFCCC; National Communications, approve EIAs, climate change policy, Environmental Act
Meteorological Service	Climate observations; issue warnings, work with sectors on climate and climate change issues
Disaster Management Office	Responsible for disaster management, work closely with SOPAC, implement CHARM, training activities
Ministry of Works (Water and Sewerage)	Responsible for provision of safe water for public, also monitor and carry out surveillance of water quality for serviced areas

<b>University of the South Pacific</b>	Wide range of research, including on climate change modelling / adaptation  Pacific Centre for Sustainable Development Deliver training programmes consistent with the Climate Change Guidelines and Assessments
<b>SOPAC</b>	Strengthen and build partnerships on Water and Wastewater in the Pacific Regional Network -Implement the Pacific Framework for Action on Drinking Water Quality and Health (2005) -Implement the Pacific Regional Action Plan on Sustainable Water Management (2002) -Implement the Pacific Wastewater Policy and Framework for Action (2001) Risk/disaster management, mapping; CHARM, cost benefit analysis
<b>WWF South Pacific</b>	Awareness raising on climate change; start marine-based GEF project
<b>SPREP</b>	Regional climate change framework
<b>Ministries for Agriculture (Land Use)</b>	Erosion, sedimentation (climate change will affect crops/ yield/ land use)
<b>International Federation of Red Cross and Crescent Societies</b>	Advocacy, awareness, and training for communities vulnerable to climate Change.
<b>Fiji Red Cross Society</b>	Mandated to carry out rehabilitation works in the first 72 hours after disaster
<b>Department of Town and Country Planning</b>	Approve developments; depends on EIAs and site reports from local authorities for their approval process  Consult with meteorological services, the Ministry of the Environment, on anticipated risks arising from town/ country development  Town planning unit has no jurisdiction on Native Land

## Jordan

<i>Organization</i>	<i>Primary Responsibility</i>
<b>Ministry of Health (MOH)</b>	Lead agency for national health protection
<b>Ministry of Water and Irrigation (MWI)</b>	Lead agency on measures related to water supply infrastructure
<b>Jordan University of Science and Technology</b>	National Consultant for PDF phase
<b>Ministry of Agriculture (MOA)</b>	Lead agency on measures related to agricultural production and safety
<b>Meteorological Department</b>	Responsible for collection, dissemination and application of national meteorological information
<b>Ministry of Planning (MOPIC)</b>	Lead agency for development and infrastructure planning, and GEF OFP
<b>Royal Jordanian Geographical Center (RJGC)</b>	Expertise in mapping hydrology, geology, environmental pollution, desertification
<b>Royal Scientific Society (RSS)</b>	Government supported applied research institution, expertise in pollution monitoring
<b>Jordan Environment Society (JES)</b>	NGO: research and capacity building in environmental protection and pollution control
<b>Jordan Society for Sustainable Development (JSSD)</b>	NGO: research and capacity building in sustainable development activities
<b>Higher Council for Science and Technology (HCST)</b>	Ministerial Council for support of science and technology
<b>Agricultural Engineers Association</b>	Professional association with expertise in agricultural and water infrastructure
<b>Greater Amman Municipality (GAM)</b>	Local government body with cross-sectoral responsibility
<b>WHO Centre for Environmental Health</b>	Regional centre; technical guidance on health protection

<b>Activities</b>	
UNDP Jordan country office	UN assistance for development projects, including through GEF

### Kenya

<i>Institution</i>	<i>Required Expertise</i>
Ministry of Health (MOH)	Division of Environmental Health (DEH)
	Division of Malaria Control (DOMC)
World Health Organization (Kenya Country Office)	Malaria, National Professional Officer (NPO)
	Environmental Health & Sanitation (NPO)
Population Service International (PSI)-Kenya Country Office	Insecticide Treated Nets (ITNs) Dept
Ministry of Environment	National Environmental Management Authority (NEMA)
Moi/Kenyatta University	Health Management Information Systems (HMIS)
	Health Services Management
	Behavioural Dept.
UNDP	Global Environmental Facility (GEF)
Kenya Meteorological Dept	Weather Forecasts
IGAD Centre on Climate Outlook	Weather Forecast

### Uzbekistan

<b>Organization</b>	<b>Key points</b>
<b>Ministry of Health</b>	Implements and monitors public health measures in the community Gives recommendations on new developments and infrastructure, drainage etc
<b>Department of sanitary inspectors</b>	Observation of the sanitary-epidemiological state of the environment Compilation of, processing and provision of stakeholders with data on infectious morbidity and mortality Realization of prophylactic measures
<b>"Health" Institute</b>	Compilation of, processing and provision of stakeholders with data on noninfectious morbidity and mortality
<b>Center of Hydro-meteorological Service at the Cabinet of Ministers of Uzbekistan (Uzhydromet)</b>	Development and improvement of the state system of hydro- meteorological observations. Provision of hydro-meteorological information to the national economy sectors and other consumers. Collection, archiving and distribution of hydro-meteorological information among customers.
<b>Hydro-meteorological Research Institute (NIGMI)</b>	Research and improvement of short/long term forecasting of weather, water content of rivers and climate change.
<b>State Committee of the Republic of Uzbekistan for Nature Protection (Goskomprroda)</b>	Provides realization of the integrated state policy in the field of the environment and ecological security Implements intersectorial, integrated environmental regulation Organizes and coordinates the activities on providing favorable environment and environmental sanitation Organizes and implements state control over environment
<b>Ministry of Emergency</b>	Implements activities in the field of civil protection, elimination of consequences of emergency situations, induced by catastrophes and natural disasters

69. In each of the countries, the preparatory phase stage established a core group of typically 6-10 agencies who formed a national advisory group for the project design. The national advisory groups were chaired by the Ministry of Health and included other key agencies, such as environment, water and meteorological agencies, WHO and UNDP country offices, and the national consultant. This group met on a regular basis throughout the preparatory phase of the project, provided direction to the national consultant in designing wider stakeholder

consultations, defining project focus and scope, reviewing draft proposals of national activities, facilitating access to agency data and information, and ensuring coherence with other plans in health and related sectors. The preparatory stage also established a wider group including community groups, academic institutions, and NGOs who were consulted in the stakeholder workshops, endorsed the proposal, and can be called upon to supply specific functions during project implementation. In many cases these build on networks already assembled by WHO and UNDP for related initiatives. However, given the time lapse between the preparatory phase and the submission for CEO endorsement due to the shortages in SCCF funding, project related outputs and related activities will be reviewed and updated once implementation commences.

## **2.0 Strategy**

70. The UNFCCC identifies climate change impacts on health and wellbeing as one of three sets of "adverse effects" that must be effectively managed through climate change adaptation. Global assessments indicate that the critical determinant of the degree to which climate hazards are translated into impacts on human wellbeing is the resilience of the health and related sectors to deal with climate-related diseases. Vulnerability and adaptation assessments have identified health as a critical issue in developing countries; e.g. 32 out of 38 NAPAs reviewed in late 2008 identify health as a priority sector for intervention, but often point out that further work is needed to identify and implement effective responses. However, the climate change community has not advanced sufficiently in how existing public health related policies and practices can be modified to reduce climate change-related health impacts. In addition, the public health community has not worked seriously on mainstreaming climate change considerations into operational health plans.

71. In this context, seven countries (Barbados, Fiji, Uzbekistan, Jordan, Bhutan, Kenya, and China) have been selected to pilot interventions to increase their respective adaptive capacity to respond to the impact of climate change on human health. The objective of this first global project on public health adaptation to climate change is to "increase adaptive capacity of national health system institutions, including field practitioners, to respond to climate-sensitive health risks". The project outcomes will contribute to the broader goal of ensuring that "health sectors are able to manage health risks driven by climate change, including variability". The project is designed as a programmatic approach for responding to climate change induced health risks through the pursuit of four outcomes. Within each of these outcomes, the participating countries will implement a set of nationally executed activities. The countries were selected because of different priority vulnerabilities to climate change so that the results of the project will cover a wide range of critical issues that will be directly relevant to decision-makers in other vulnerable countries.

### **2.1. Project rationale and policy conformity**

72. The project will address the lack of adaptive capacity identified in the baseline analysis by supporting interventions to ensure that the pilot countries will have measurable increases in their capacity to adapt and reduce health impacts of climate change. Thus, it will involve national action both to build systemic and institutional capacity to support adaptation to climate change in the health sector, as well as demonstrating adaptation measures on the ground. The project will also promote learning within each project country as well as across countries, and link to the GEF's ALM and UNDP Teamworks mechanism.

73. Based on the baseline assessments undertaken in each country, the project will implement new and modifications of existing strategies, policies and measures so as to increase the coping range of human societies in response to climate-sensitive diseases. The project will conform with overall policies guiding UN support for development and health protection in general, and climate change in particular. For example, it target its efforts on populations at elevated risk of the specific health risks identified, and adapt interventions for population subgroups in order to increase effectiveness - e.g., where appropriate, differential content and means of dissemination of public health information messages for women and men. Through the project interventions, the health sector will become more positively engaged in the adaptation process, by focusing on changes that will also bring measurable gains in the short-term and long-term. Indicators associated with global Outcome 2, supported by similar indicators within each country programme, will measure this increased engagement.



74. In this project, co-financing will be mobilized to enhance the baseline, while GEF resources will be used to target additional activities that increase the adaptive capacity to respond to the impacts of climate change, while co-financing from WHO and others will continue to support those activities associated with baseline development. Through standard UNDP and WHO financial monitoring measures, the sliding-scale principle will be applied to the nationally-executed programmes in the individual countries, consistent with the GEF's programming papers for the SCCF.

#### **(i) Consistency of the project with the objective and priorities of the Source of Fund (SOF)**

75. The GEF Council paper GEF/C.24/12 (October, 2004) states that the SCCF will be available to finance the additional costs of achieving sustainable development imposed on vulnerable countries by the impacts of climate change. In particular, SCCF projects will address the challenges faced by developing country Parties as a result of the impacts of climate change. The need to adapt to the adverse impacts of climate change presents additional barriers to the achievement of a country's sustainable development goals. Activities to overcome some of these barriers may not generate global benefits, e.g. activities in the health sector.

76. The project is consistent with the eligibility criteria for the SCCF, as laid out in GEF/C.24/12 (paragraph 40), in that the project is:

- country-driven, cost-effective and integrated into national sustainable development and poverty-reduction strategies; and
- takes into account national communications and other relevant studies and information.

77. The project will also serve as a catalyst to leverage additional resources, and efforts have been made to maximize co-financing from other sources (GEF/C.24/12, paragraph 25). The selected sector is one of the priorities outlined in paragraph 44 of the GEF document, namely health.

78. The project will support capacity building, including institutional capacity, for preventive measures, planning, preparedness and management of disasters relating to climate change, including contingency planning for droughts and floods in areas prone to extreme weather events (GEF/C.24/12, paragraph 46), and support strengthening existing centers and information networks for rapid response to extreme weather events, utilizing information technology as much as possible (GEF/C.24/12, paragraph 47). Furthermore, climate-related health issues impact disproportionately on the poor, and the project therefore recognizes the link between adaptation and poverty reduction (GEF/C.24/12, paragraph 41). This proposal requests the GEF to finance the additional costs of achieving sustainable development imposed on the participating countries by the impacts of climate change (GEF/C.24/12, paragraph 51).

#### **2.1. Country ownership: country eligibility and country drivenness**

79. The countries participating in this project have highlighted the importance of health concerns, including in many cases prominently featuring health concerns within their National Communications to the UNFCCC (e.g. Bhutan initial national communication, foreword, first paragraph (Bhutan Government, 2000), Fiji first national communication, Executive summary, page vii (Fiji Government, 2005)). They also highlight lack of examination of health adaptation policy options as a key need (e.g. UNFCCC documentation from Kenya (Kenya Government, 2000); Barbados first national communication, Vulnerability assessment section: Conclusions (Barbados Government, 2001)). All participant countries have also committed to act specifically to address health risks from climate change through a resolution of the World Health Assembly in May 2008 (WHO, 2008b), and through their request and endorsement of a new WHO workplan, which emphasises cross-sectoral adaptation measures to improve health protection (WHO, 2008a). This project will help address the expressed need for improved health coverage in national communications to the UNFCCC in all participating countries, by producing directly relevant information on health vulnerability and adaptation, and by the formation of the national project advisory groups, which directly link Ministry of Health and UNFCCC focal agencies.

80. Preparatory phase activities raised awareness across a range of agencies within each country of the potential health impacts of climate change, and of each country's need for the proposed adaptation projects. Previous activities (e.g. WHO awareness raising workshops), and ongoing consultations with each country have confirmed that health and other relevant national ministries, as well as WHO and UNDP country and regional offices, are committed to working on adapting to health threats from climate. Endorsement letters from both the national Ministry of Health and the GEF Operational Focal Point have been submitted during the pipelining of the Project Identification Form on several occasions in 2007, 2008 and 2009.

## **2.2. Design principles and strategic considerations**

### **(i) Contribution of the project to the GEF supported adaptation portfolio**

81. The project has several strengths as an addition to the GEF adaptation portfolio. It is innovative, in that it will be the first project to work specifically on planning, implementing and monitoring adaptation measures to protect human health from climate change, at the global level, across developing countries. The project catalyses the increasing awareness and concern expressed by the health sector in developing countries, into a concrete and positive response, that brings the health sector as an engaged partner in climate change adaptation planning. It is strategic in that it will pilot interventions across a broad range of health vulnerabilities to climate change, but with sufficient commonalities in terms of climatic risks and societal vulnerabilities, to allow general lessons to be drawn, that can inform subsequent intervention efforts.

### **(ii) Linkage of the project to relevant national policy processes**

82. In 2008, the 193 countries constituting the World Health Assembly adopted a resolution committing to action to address the health risks of climate change. By October 2009, this will have been reinforced by regional frameworks of action covering each of the six WHO regions. All countries in this project have been active in these processes, and are signatories to the relevant resolutions. Several of the countries have also prominently featured health concerns within their National Communications to the UNFCCC (e.g. Bhutan, Fiji). They also highlight lack of examination of health adaptation policy options as a key need (e.g. UNFCCC documentation from Kenya; Barbados). National health agencies are now more forcefully stating the importance of detailed coverage of health vulnerability and adaptation within the second national communications (e.g. proposal from China Centers for Disease control, for full involvement in the national coordination committee on climate change, and from the Jordanian Ministry of Health to contribute a health section to the forthcoming national communication). This project will help address the expressed need for improved health coverage in national communications to the UNFCCC in all participating countries, by producing directly relevant information on health vulnerability and adaptation, and by the formation of the national project advisory groups, which directly link Ministry of Health and UNFCCC focal agencies.

83. The project is also supported by, and fully integrated into, the programme priorities of WHO and UNDP. In 2009, the WHO Executive Board approved a new global WHO work plan on climate change and health, specifying the strengthening health systems to cope with increased risks from climate change as one of its four main objectives. The project is supported by the relevant technical units within WHO that deal with climate change, health actions in crisis, water and sanitation, and communicable disease surveillance and control, as well as its regional and country offices. The project has equivalent support and integration within UNDP at Headquarters, regional, and country levels. WHO and UNDP country offices were directly involved in the coordination and preparation of the national activities within the preparatory phase, and have ensured coordination with their other support to countries. For example, in Kenya the proposed activities will be integrated into the WHO-supported National Malaria Control Programme, and build on initiatives currently financed from grants from the Bill and Melinda Gates Foundation for malaria control. In Bhutan, the project will provide the necessary integration of health considerations into UNDP's work with the Royal Government on disaster risk management through the UNDP-supported National Disaster Management Strategy and the UNDP/LDCF project that supports adaptation in key areas, such as glacial lake outburst floods. Similarly, in Fiji, the project will integrate health and climate change adaptation issues into UNDP's work on sustainable use of

freshwater resources and improved access to water supply and sanitation services. There will be no duplication with other activities in the GEF portfolio or other activities that are currently underway with funding from other resources.

### **(iii) National and local benefits**

84. The project will deliver benefits to seven GEF-eligible countries through implementation of policy changes and specific intervention measures to reduce vulnerability, and increase resilience to climate change. An added advantage of the proposed global approach is the opportunity for learning and exchange of lessons among those countries sharing similar types of vulnerability, and those facing different types of climate change impacts. This will yield greater benefits than an equivalent number of individual projects.

85. The specific benefits will vary by country. Detailed information of benefits identified by individual countries include:

#### **Barbados**

86. The project will reduce Barbados' vulnerability to climate change by improving its ability to protect human health and its capacity to adapt. The planned interventions will assist in developing wastewater reuse guidelines and identifying processes to augment the water supply for potable and non-potable uses, reducing the health risks. The project will also improve the coordination and cooperation between relevant governmental and nongovernmental organizations.

87. At the local level, there will be improved practices for the storage of rainwater, preventing the breeding of *Aedes aegypti* and ultimately reduce the incidence of dengue fever. Increased awareness of *A. aegypti* breeding sites in rainwater tanks will also increase awareness of other potential breeding sites and increase people's efforts to reduce overall breeding opportunities. Local perceptions will be changed with regards to the utilization of wastewater. With a system in place for the safe use of treated wastewater, local health risks will be reduced. The level of public knowledge will be enhanced as it relates to wastewater reuse.

#### **Bhutan**

88. The greatest national benefit envisaged in the implementation of the proposed National climate change Health adaptation program will be that it will enhance awareness and capacity of health workers and the community at large. It will also help in increasing the effectiveness of monitoring of health issues and the effectiveness of control interventions (by directly measuring the actual incidence of these diseases, and comparing these with the expected trends in incidence based on climate suitability).

89. At the local level, this program will help create awareness on the health impacts of climate change. The local people will also benefit from improved rural water quality and community sanitation, including enhanced community participation in prevention of climate sensitive diseases.

#### **China**

90. More than 2.6 million people die from cerebro-cardiovascular and respiratory diseases annually; this is approximately 45% of all deaths. The medical and other costs of cerebro-cardiovascular and respiratory diseases exceed 200 billion Yuan per year, which creates as severe burden for both the society and for individual families. Implementation of effective adaptive measures will reduce the incidence and the mortality of the cerebro-cardiovascular and respiratory diseases during heatwave events, thus improving people's quality of life and greatly reducing the social-economic burden.

91. The project will strengthen health education and training on the impacts of climatic change on the environment and human health, increase school and university course content on global climatic change, and increase awareness of the potential impacts climatic change across various media, and test heat-health warning systems as a response to increased frequency of heatwaves in urban centres in China. In addition to increasing

awareness of the potential health impacts of climate change, this component will increase citizen's consciousness of protecting the global environment, and encourage the public to establish life styles and consumption modes that reduce greenhouse gas emissions.

### **Fiji**

92. The principal expected benefit for the health sector is having a functional Health Information System that is capable of generating Early Warnings for Climate Sensitive Diseases and communicating these effectively to relevant stakeholders. Although a system nominally exists, it is not currently functional. This would in turn enable field practitioners to carry out required interventions as per requirements of the Early Warning and Response System Guidelines (to implement the pre-prepared health sector responses that are necessary to minimize the immediate to short-term health effects of floods and other disasters), and the Psychosocial Intervention Guidelines (to minimize the well-documented medium to long-term mental health consequences of weather-related disasters). These systems would be adapted from the emerging experiences in health sector response to weather-related natural disasters, for example the heat and flood warning and response plans that are now being implemented in Europe and North America, and will share relevant lessons across countries participating in this project (e.g. China, on heat-health warning plans).

93. The project will also create awareness amongst communities, hence having communities that are more resilient to climate change and variability. Furthermore it is anticipated that the project would further strengthen both inter disciplinary collaboration and communication within all levels the Ministry of Health. The proposed project would also strengthen inter sectoral collaboration at all levels with other key government agencies such as the Fiji Meteorological Service in provision of relevant climate data, the National Disaster Management Office in the integration of HMD plans into the National Disaster Management Contingency Plans and NSAs such as The Fiji Red Cross, the International Federation of Red Cross and Red Crescent (IFRC). This should contribute to the revival of the Fiji Climate Change Country Team to ensure proper coordination of Climate Change activities in the country.

### **Jordan**

94. Upon successful implementation of the proposed project, the level of national preparedness and adaptation to protect human health from a key risk associated with climate change and climate variability, will be elevated. This will result from integrated interventions in Jordan's regulatory and monitoring systems associated with human health protection. The country will have developed and implemented a national framework, including guidelines and best practices for safe wastewater reuse. There will be a review and strengthening of the regulatory and monitoring systems to protect human health from risks associated with use of wastewater, which is expected to increase under climate-change driven water stress. Wastewater reuse activities will be monitored to ensure implementation of these guidelines through a modern monitoring system run by employees with enhanced technical and management capacity. Furthermore, the level of coordination and cooperation among different governmental and non-governmental organization concerned with climate change adaptation to protect human health will be enhanced. Addressing this key health risk will raise awareness and strengthen institutional capacity to address other health risks from climate change within Jordan.

95. On the local level, all areas where wastewater reuse is practiced will have a safer and healthier environment. The residents of these areas will experience better health services through a new disease surveillance system. The health conditions of farmers and farm workers will also be improved. The level of public knowledge of basic hygiene and health protection measures will be upgraded through awareness programs. Furthermore, economic benefits will be attained at both national and local levels through fresh water savings and higher value of safer agricultural products.

### **Kenya**

96. The greatest national benefit envisioned in the implementation of this project is reduction in the burden of highland malaria epidemics relative to projected rates under conditions of climate change but without project interventions. This enables the design of tailor-made interventions, with its implementation providing multi-fold benefit to the National Malaria Business plan 2006-2010. This plan is implemented through the Annual Operational Plan under which malaria is one of the health problems to be addressed by the Kenya Essential

Package of Health (KEPH). Implementation of this project within KEPH will provide the necessary impetus to enhance management structures of all KEPH provisions under clear lines of management. Part of this is the establishment of management structures such as the proposed National Climate Change Adaptation Consultative Committee whose mandate will be to provide technical operation and strategic guidance. This project will provide the impetus required for implementation of malaria epidemic prevention measures through the KEPH strategic approaches, focussing on highland areas.

97. Additionally, the project will strengthen partnerships, including: meteorological department provision of forecasting data to KEMRI; improved interactions between health officers and stakeholders; and sharing of resources and reduction in duplication of tasks within a district. The local community will receive central support in their efforts to reduce malaria burdens due to climate change through linking this project with other relevant programs, such as meteorological information linked to health through the RAdio InterNET service and capacity building through CICETS. Community participation in malaria control activities will promote ownership, guaranteeing sustainability and widespread use of Integrated Vector Management intervention (IVM) measures.

### **Uzbekistan**

98. The project will provide national benefits through implementing the first concrete health adaptations to climate change, expressed as an urgent need within the draft Second National Communication to the UNFCCC. Long-term adaptive capacity will be improved through enhancement of the knowledge and skills of health personnel to monitor variations in climate and take preventive actions, and the national population will have enhanced capacity for self-protection. The country will receive a developed and tested system of early warning and a plan of action to protect population health from climate-related risks.. On the local level two provinces will have a well-designed, tested and readily available system to improve population health. Overall, the project will reduce the mortality and morbidity rates of cardio-vascular, acute intestinal and respiratory diseases caused by lack of appropriate response measures to climate variability and change, thereby contributing to population health and human development. The project will also contribute to enhanced awareness of the potential for well-planned adaptation to reduce impacts in health as in other sectors.

99. The project makes use of the comparative advantage of UNDP in supporting climate change adaptation activities across a wide range of sectors, and the technical expertise of WHO in assessing climate risks to health and defining appropriate responses, as well as the strong presence of both organizations to support implementation at country level. The involvement of WHO and UNDP country, regional and headquarters offices will ensure consistency with, and support for, the UNDP focus on climate-resilient development and the implementation of the WHO global workplan on health protection from climate change.

### **2.3. Project Objective, Outcomes and Outputs/activities**

100. Well-planned adaptation measures can contribute to reducing these climate change driven health impacts and associated negative effects on development. The project will undertake interventions to increase adaptive capacity which, together with parallel initiatives outside the systems boundary, but identified in the assumptions column of the logical framework analysis matrix, will secure reductions in health impacts from climate change. Although, as noted earlier, there is an increasing awareness in the health sector that climate change poses significant threats to human health, there has been little definition of concrete measures to increase long-term resilience of the health sector to climate change, and practitioners have concentrated on reactive responses, historically. Consequently, little attention has been paid to exactly what vulnerable developing countries can do differently to minimize adverse health impacts of climate change in a cost-effective manner, while simultaneously strengthening efforts to solve current health problems. Such actions would require coordination between all sectors dealing with climate change adaptation, as well as those implementing broader development plans.

101. Generic approaches for adaptation to climate change have been developed, but there is still limited experience in applying these in the field (Kovats et al., 2003a). Most health risks of concern with climate change currently cause excess morbidity and mortality somewhere in the world. Public health has more than 150 years of experience dealing with disease outbreaks, so there is expertise on disease control activities. However, public

health has limited experience with designing and implementing programs to address large-scale exposures projected to increase gradually over time, and none have been applied in developing countries. By drawing upon successful health interventions, this project will address this need.

102. Consequently, the objective of the project is to increase adaptive capacity of national health system institutions, including field practitioners, to respond to climate-sensitive health risks. This will contribute to the broader goal of ensuring that health sectors are able to manage health risks resulting from climate change, including variability. The project Objective also corresponds to the third of the four global objectives identified under TA3 (Health) in UNDP's global "Monitoring and Evaluation Framework for Adaptation", namely Adaptive Capacity: Capacity for surveillance of and prevention/response to climate-sensitive diseases improved and/or expanded. The project Objective also corresponds to the Objectives of the WHO workplan 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, in order 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. The project will therefore 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

103. In order to secure the project objective, the project will pursue 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 are common across all countries, the global Outputs are indicative – country-specific Outputs will adapt the global Outputs to address the local conditions and constraints. Examples of the main country specific Outputs are described below for each Outcome.

104. The system boundaries vary by country and by outcome. Outcomes 1 (Early warning and response system with information on likely incidence of climate-sensitive health risks established), and 2 (Capacity of health sector institutions to respond to climate-sensitive health risks based on early warning information improved) are mainly concerned with data sharing and analysis, definition of operational roles, and development of training and public information. The system boundaries in these cases are the entire country. Outcome 3 (Disease prevention measures piloted in areas of heightened health risk due to climate change) will in contrast be implemented nationally in the smaller countries (Barbados, Bhutan, Fiji), and at subnational level in either 2 or 3 specific locations in the remaining countries. Outcome 4 (Cooperation among participating countries promotes innovation in adaptation to climate change including variability) will be implemented globally. Examples of the main country specific Outputs are described below for each Outcome.

***OUTCOME 1: An early warning and response system with timely information on likely incidence of climate-sensitive health risks established***

Co-financing amount for Outcome 1: US\$6,536,000

LDCF project grant requested: US\$ 1,146,000

**Without SCCF Intervention (baseline)**

105. All countries involved in this project have an existing early-warning and response system for major health risks in place. However, these systems are sub-optimal in all cases. Consequently enhancement of the baseline is required in all cases to enhance health surveillance in general, including providing timely recording or age and sex-disaggregated case data, and to make the early warning and response systems effective under current climate conditions. In most cases, the existing weaknesses in the system are mainly related to processing and use of data, with the result that information on health and climate issues does not reach health practitioners in time to initiate

preventive measures. Consequently, global Outputs 1.1 (Climate-sensitive health risk data are reported in timely and reliable manner to disease control agencies) and 1.2 (Climate data are reported in timely and reliable manner to disease control agencies) will be funded almost entirely through co-financing. In the case of Fiji, the need for additional human resources was also identified during the design phase, while in Uzbekistan, the need for an enhanced computer-based information system was also identified. These are country-specific interventions that will also be funded through co-financing. In contrast, the existence of the National Malaria Strategy in Kenya means that many of these enhancements of the baseline activities have already been undertaken.

**With SCCF Intervention (adaptation alternative)**

106. Under current climatic conditions, the national health and climate monitoring systems are not linked. As climate change starts to impact health issues more intensively, there will be an urgent need to link climate and health information systems in order to establish effective early warning systems, so there is an element of additionality associated with global Outputs 1.1 and 1.2. Again, in the case of Kenya, where highland malaria outbreaks are closely linked to weather conditions, this link is already established, and global Outputs 1.1 and 1.2 are not required. In all countries, however, the relationship between climate and health issues is likely to change as the climate changes. For example, relationships between temperature and infectious disease outbreaks are likely to change because climate change not only affects temperatures but also precipitation patterns. This will result in existing relationships between these variables no longer being relevant. Global Output 1.3 (Climate change-induced changes in drivers of health-risks are determined) addresses this issue, and this is an additional issue for which GEF funding is requested. Activities required to achieve this Output do not necessarily involve primary research – a broader analysis of existing data to incorporate combinations of variables not currently considered in the early warning and response systems will guide design of early warning and response systems.

107. Effective responses to climate-related health risks depend on reliable warning at the earliest possible stage of the development of a health threat. Although the specific drivers of different health issues will be diverse, the general approach will be replicable across many health issues based on experiences generated by the project. There are two elements to improved early-warning. The first relates to enhancement of the baseline through improved monitoring systems and analytical capability. Interventions to address these short-comings will be financed through co-financing. The second element relates to the fact that as the climate changes, so the specific combination of drivers required to generate a disease epidemic or health risk event will change. Improved understanding of how the drivers interact as climate changes to trigger events will assist in addressing the climate change-related aspects of the health risk. This component is additional, and therefore eligible for financing under the SCCF guidelines. The benefits derived from this additional component are also sustainable. A second form of additionality relates to the increasing area over which health risks are likely to occur. For example, malaria in Kenya is likely to steadily expand to higher altitudes, without a corresponding retraction at low altitudes. This requires an expansion of the prediction network, which is more susceptible to problems of sustainability as it will require on-going investment to maintain. However, the strong links within the project to policy development will promote sustainability of such forms of additionality.

*Output 1.1: Information systems supporting integrated assessments of climate change risks embedded into management and long-term health planning mechanisms in 7 countries*

*Output 1.2: Financial sustainability plan developed to sustain information systems for at least 5 years*

Indicative activities in each country are outlined below:

<b>Country</b>	<b>Baseline (existing or to be co-funded)</b>	<b>Additional elements (GEF SCCF Funds)</b>
<b>Barbados</b>	Monitoring of meteorological data, and of water quality. Unlinked surveillance of dengue vectors, unlinked and passive surveillance of incidence of water-related diseases,	Analysis of relationship between meteorological variables and incidence of water-related diseases and dengue to develop early warning system, with flexibility to update as climate change and other trends alter relationships. Establishment of communication mechanisms for advance warning

	and of dengue.	and definition of operational procedures for health sector response to contaminated water, and to dengue outbreaks.
<b>Bhutan</b>	Planned development of GLOF warning system, but without defined health sector role.  Maintenance of capacity for passive surveillance <sup>3</sup> of climate-sensitive infections, emergency health response.	Mechanism to provide GLOF early warnings to emergency health services, operating procedures for health sector response.  Establishment of prediction system for climate sensitive infectious diseases, covering seasonal variation, and increase and spread in transmission with climate change.
<b>China</b>	Collection of meteorological data, mortality and morbidity data, linked to form heat-health warning system only in one city (Shanghai).	Development of over-arching coordination mechanism to link meteorological and health monitoring data. Development of algorithms for correlation of met. and health data, providing advance warning of health risks from heatwaves, with flexibility to update as climate change and other trends alter relationships.
<b>Fiji</b>	Collection of meteorological data and weather forecasting; unlinked and passive collection of disease morbidity and mortality data.	Development and implementation of Health Information System covering hydro-meteorological disasters (HMDs) and climate-sensitive diseases, integrated between meteorological and health agencies. Development of operational procedures to manage psychosocial impacts of HMDs.
<b>Jordan</b>	Monitoring of chemical and microbiological contamination in wastewater and food, by multiple agencies. Unlinked and passive surveillance of diseases linked to wastewater.	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.
<b>Kenya</b>	Remote and ground-based collection of meteorological data. Unlinked and passive surveillance of malaria incidence, with exception of specific sentinel sites as part of specific research project (HIMAL).	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 decision support system for response to malaria epidemics, and expansion to areas newly at risk due to climate change. Development of protocol for updating prediction algorithms as climate and other drivers change.
<b>Uzbekistan</b>	Collection of meteorological data and weather forecasting; passive collection of disease morbidity and mortality data. But unlinked to meteorological data, or to operational protocols to strengthen disease response in periods of elevated risk.	Development and 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 protocol for updating prediction algorithms as climate and other drivers change.

<sup>3</sup> Passive surveillance refers to registering of cases reported to health services, as opposed to more sensitive and unbiased active surveillance, in which populations are actively surveyed for disease.



***OUTCOME 2 Capacity of health sector institutions to respond to climate-sensitive health risks based on early warning information improved***

Co-financing amount for Outcome 2: US\$ 5,700,000.

LDCF project grant requested: US\$1,014,000

**Without LDCF/SCCF Intervention (baseline)**

108. In all countries, the health sector institutions have the goal of responding to health risks so as to minimize mortality and morbidity. However, in each of the participating countries the effectiveness of health care institutions is constrained by factors such as limited funding, low education levels, and inadequate facilities. Details for each participating country are given in Annexes 1.1 to 1.7. Consequently, in order to build capacity to respond to climate-sensitive health risks, basic capacity needs to be improved, and this represent enhancement of the baseline, to be funded through co-financing. Global Output 2.1 (Clarified and harmonized institutional mandates and procedures) is mostly associated with enhancement of the baseline, although interventions addressing increased capacity to respond to climate-change induced health risks through structural changes in mandates and procedures are additional. In Barbados, where increased use of treated wastewater is the main intervention to address climate-related health issues resulting from less secure sources of water for consumption, the national interventions are limited to increasing the social acceptance of the technology, which are entirely associated with enhancement of the baseline. Similar issues apply in Jordan, where guidelines and standards will be developed and institutional responsibilities assigned, which address weaknesses in the baseline.

**With LDCF/SCCF Intervention (adaptation alternative)**

109. In addition to improving the baseline capacity in institutions responsible for health care, the project will also improve knowledge and understanding of the impacts of climate change, through global Output 2.2 (Trained district and central health managers). While some of the training addresses basic needs such as up-dated diagnosis and treatment protocols, which will be funded through co-financing, the majority of interventions required under this Output are additional. In Fiji, where climate-induced water stress is one of the health issues to be addressed by the project, the small size of the country means that interactions among sectors is more intensive than in most other countries, the integration of climate into environmental health impact assessments is an additional intervention to be funded by the GEF. Similarly, the structure of the health sector in Uzbekistan, which involves not only primary health care personnel but also a network of units governing local communities – makhalyas, means that training and awareness raising will need to occur at several levels.

110. Improved availability of relevant information, generated under Outcome 1, is only of value if health sector institutions have the capacity to use the data to improve policies, planning and response measures. Health sector institutions include both the centralized agencies, whose mandate will normally include national level monitoring of health risks, the processing of data, and the issuance of health advisories, and local health-care institutions, which will need to have the capacity to respond to information generated by centralized agencies.

111. In particular, as climate-change induced health risks are expected to increase in frequency and severity, so the capacity of health sector institutions will need to be enhanced. This may include, for example, more effective devolution of responsibilities in order to be more responsive to temporal and spatial variation in health risks. Such changes will be sustainable.

***Output 2.1: Clarified and harmonized institutional mandates and procedures to respond to climate risks to public health***

112. This includes activities such as developing and implementing an institutional framework to managing health risks that cut across institutional boundaries. For example the increased use of wastewater as a response to water scarcity driven by climate change, requires clear definition of the multiple concerned institutions that have responsibility for monitoring water quality, farmer and consumer health and safety, and specifying which legal standards are enforceable in each case. Response to increasing risks of cardiovascular disease in heatwaves

requires definition of authority for issuing warnings of hazardous meteorological conditions, public health advisories that take account of intra-population differences (such as with age and sex) and alert of emergency health services. Such activities constitute enhancement of the baseline. But activities under this Output will also consider and implement changes in institutional mandates and procedures to promote increased capacity to respond to climate-change induced health risks through structural changes in mandates and procedures. Such activities, as they respond to climate-induced health risks, are additional.

*Output 2.2: Training syllabus and long-term support mechanisms for community and national level health protection from climate change developed; more than 180 District and central health managers trained across 20 Districts in 7 countries*

113. As for the preceding Output, activities contributing to this Output will both enhance the baseline (though co-financing) and represent additional investments. Training for future climatic conditions carries the risk of lack of sustainability, so the project will focus more on establishing training syllabi and resources to long-term support (such as mentoring and peer-to-peer consultations), and training of trainers to support training of health managers to be responsive to changing climatic conditions. WHO will provide technical support to competent national training agencies and ensure quality of content.

Indicative activities in each country are outlined below:

<b>Country</b>	<b>Baseline elements</b>	<b>Additional elements (GEF funded)</b>
<b>Barbados</b>	Existing plans for increased use of wastewater in agriculture, but without consideration of health implications. Health sector management, training and support for dengue vector control, but without consideration of how water storage in response to climate change will increase dengue risks.	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.
<b>Bhutan</b>	Management and training for control of climate-sensitive disease, but no coordination with wider climate change adaptation efforts, or spatial and temporal targeting of disease control with respect to climate.	Definition of health working group within existing inter-sectoral coordination mechanism for adaptation to climate change.  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.
<b>China</b>	Training and support of health sector personnel to prevent and to treat diseases that are aggravated by extreme heat, but lack of coordination mechanism specifying institutional roles of health versus other sectors in heatwaves.	Development and support of coordination mechanism, and development of operational procedures for meteorological and health sectors during heat-waves. Development and support of training for emergency medical treatment during heat-waves.
<b>Fiji</b>	Fiji Climate Change Team exists, but dormant and no health representation. HMD response plans exist, but without coordination between health and Disaster Management Offices. Public	Development and support for coordination mechanism for climate change and health action. Development of health action plans, incorporation in HMD response plans in Health Ministry and National Disaster Management

	Health act is being revised, but without consideration of disaster risk-reduction measures.	Office. Revision of Environmental Health Impact Assessment process to support disaster risk reduction.
<b>Jordan</b>	Existence of multiple legislative tools for managing wastewater, but without consideration of how they should be coordinated to minimize health risks.	Development of a coordinated legislative framework to minimize health risks from increased wastewater re-use, with defined institutional responsibilities, coordinated by inter-sectoral board. Revision and updating of framework and monitoring standards based on project and international experience.
<b>Kenya</b>	Training and support of health sector personnel to respond to malaria epidemics, but lack of training on how climate change may increase risks, or how meteorological information can improve response effectiveness.	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.
<b>Uzbekistan</b>	Training and support of health sector personnel, and health education campaigns to control climate-sensitive diseases. But no training on how increasing temperatures and water stress will increase risks, or use of meteorological information for temporal targeting of interventions.	Health sector training 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 through climate change.

***OUTCOME 3 Disease prevention measures piloted in areas of heightened health risk due to climate change***

Co-financing amounts for Outcome 3: US\$4,023,000.

LDCF project grant requested: US\$1,540,000

**Without LDCF/SCCF Intervention (baseline)**

114. In some cases, demonstrating effective responses requires substantial improvements to existing health delivery systems, in which case the global Outputs 3.1 and 3.2 will involve a significant amount of enhancement of the baseline. For example, some of the interventions identified for Bhutan include vector control through bioenvironmental measures and community malaria prevention and treatment systems. These are clearly interventions required under the baseline situation and will therefore be funded through co-financing. Similarly, in China, to deal with the effects of heat-waves, some of the identified interventions are the implementation of a support system for high risk people, including upgrading the training and equipment for medical care, and establishing 24 hour on call response capacity at community hospitals; and implementation of a system of regular physical examinations and medical health surveillance for populations at high risk during heatwaves. Such interventions are also enhancing the baseline. In Kenya, interventions to spray houses, to increase the number of people using insecticide treated nets, and to undertake environmental modification (including mapping and filling-in of the breeding sites as well as digging drainage trenches in the permanent breeding sources) are measures that should be promoted even under current climate conditions.

**With LDCF/SCCF Intervention (adaptation alternative)**

115. On-the-ground demonstrations which incorporate links to climate information into existing health care plans represent additional investments that apply both to global Output 3.1 (Response plan for pilot districts) and 3.2 (Treatment applied on the basis of plan, in response to warning system information). Such investments should

be funded through the GEF. Good examples are to be found in Fiji, where enhanced procedures and resources for advance planning and allocation of resources in order to provide timely psychosocial responses to disasters including extreme climate events will be needed as such events become more frequent and severe.

116. Although project interventions have been designed to be sustainable, some elements of the sustainability strategy do require on-going investments from national governments. For example, as discussed under Outcome 2, training of health-care workers is a recurring requirement that will continue after the project is completed. Also, as part of the cost-effective approach to project implementation, activities will be implemented in pilot sites, so full benefits will accrue only after scale-up and replication.

117. Consequently, this Outcome is important for two reasons. Firstly, it will demonstrate the benefits derived from project interventions so as to highlight the importance of continued government investment and the benefits to be gained from scale-up and replication. Secondly, it will test the adaptive capacity developed under the first two Outcomes, which will be important for the learning component of the project (Outcome 4). Demonstrating responses in the field will highlight flawed or weak assumptions, which in turn will generate lessons to increase adaptive capacity in the pilot sites and to facilitate replication.

118. This Outcome includes both enhancement of the baseline and elements of additionality. Demonstration of improvements to existing health delivery systems represent enhancement of the baseline, while demonstration of modifications designed to raise adaptive capacity to deal with the impacts of climate change are additional.

*Output 3.1: Advance planning of responses for pilot locations*

119. In each country, detailed plans for demonstration of responses to the identified national priority climate-change induced health risks will be developed, incorporating modifications and improvements generated under Outcomes 1 and 2. Pilot districts (see system boundary information in the Additional Costs Analysis) have been selected based on the vulnerability assessment based on criteria of (i) already experiencing significant levels of the health issues targeted under the project (e.g. cardiovascular disease in extreme heat; malaria epidemics, exposure to wastewater), (ii) expected significant increases in these stresses, based on future climate projections (e.g. temperature increases facilitating malaria transmission), and socioeconomic, demographic and geographic vulnerability factors (aging urban populations increasing vulnerability to heat stress, unavailability of other water sources necessitating use of wastewater), and (iii) willingness of local health agencies to implement the project activities.

*Output 3.2: Preventive interventions applied on the basis of plan, in response to warning system information*

120. The project will support implementation of the plans developed under Output 3.1. In particular, the enhanced planning and delivery of preventive health interventions in response to improved prediction systems will be demonstrated. Indicative country specific activities are outlined below:

<b>Country</b>	<b>Baseline elements</b>	<b>Additional elements (GEF funded)</b>
<b>Barbados</b>	Maintenance of curative services for water-related diseases including dengue, health education campaigns for community level dengue vector control. But without explicit targeting on periods of high climatic risk.	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 effectiveness in reducing risks of water-related diseases, including severity of dengue outbreaks.
<b>Bhutan</b>	Maintenance of emergency health services, and control and treatment of climate-sensitive diseases, but without explicit targeting on high risk periods and	Implementation of interventions for epidemic control in response to GLOFs and other climate-related natural disasters.

	locations.	Scale up and targeting of community level interventions for control of water and vector-borne disease, for times of peak incidence, monitoring of effectiveness in reducing summer disease peaks.
<b>China</b>	Maintenance of preventive and curative services for cardio-vascular and other diseases aggravated by heat-stress, but lack of advance planning of preventive measures based on heat-health warnings.	Implementation of heat-health warning systems in 3 pilot cities, monitoring of effectiveness in decreasing heat-related mortality.
<b>Fiji</b>	Maintenance of national health system (management, infrastructure, personnel) from national to local level; but lack of implementation of health early warning and response to HMDs.	Implementation of Early Warning and Response system developed above, with monitoring of effectiveness in minimizing immediate and secondary (e.g. disease outbreak) health impacts of HMDs.
<b>Jordan</b>	Health and safety legislation covering agricultural sites, but without explicit consideration of health risks from wastewater. WHO global guidelines on safe wastewater re-use practices exist, but not implemented in Jordan.	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.
<b>Kenya</b>	Maintenance of malaria control programme, but without investment to address increased frequency and intensity of malaria epidemics expected through 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 warning system above. Monitoring and evaluation of increased coverage and targeting of interventions, and reduction in malaria mortality and morbidity during epidemics.
<b>Uzbekistan</b>	Existing services for treatment and prevention, but without explicit targeting on high risk seasons, and without investment to address increased disease burdens expected through increasing temperatures and water-stress.	Implementation of 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 (diarrhoea).

***OUTCOME 4 Cooperation among participating countries promotes innovation in adaptation to climate change including variability***

Co-financing amounts for Outcome 3: US\$400,000

LDCF project grant requested: US\$381,000

**Without LDCF/SCCF Intervention (baseline)**

121. As this Outcome deals with learning lessons about adaptation to climate change in the health sector so as to influence policy and to promote innovation, there are no enhancements of the baseline issues.

**With LDCF/SCCF Intervention (adaptation alternative)**

122. All of the global Outputs under this Outcome are additional, to be financed by the GEF.

123. Learning is an important goal of the GEF adaptation portfolio, and this project is the first to work on practical adaptation within the health sector across a diverse range of countries. This project will therefore place a high emphasis on the learning component of project design, using monitoring and evaluation good practices. Rigorous evaluation will enable the GEF and other agencies to measure progress and the GEF to learn how to strengthen and widen its portfolio. The UNDP/GEF's Adaptation Learning Mechanism (ALM) and the UNDP Teamworks mechanism facilitate this learning process.

124. The ALM is designed to contribute to the integration of adaptation to climate change within development planning of non-Annex I countries, and within the GEF's portfolio as a whole. From the GEF family perspective, sharing knowledge among users will ensure that the GEF portfolio, as a whole, can benefit from the comparative strengths and experience of the various Implementing and Executing Agencies.

125. Significant effort will be placed into external communication of the lessons learned from the project. This will occur both through specific products such as the project website, and also through incorporation of project outputs and lessons learned into ongoing communication activities from WHO and UNDP (e.g. list-serves for public health and environment and for climate negotiations). At least 50% of the project budget lines for contractual and professional services under outcome 4 is expected to be dedicated to communication activities.

126. Specific Outputs to be secured under this Outcome are described in the individual country programmes in Section IV, Part II, but in general the Outputs include:

*Output 4.1: Project web site*

127. A project web-site will facilitate exchange of information and dissemination. The site will include both public access and restricted-access areas, and will also be linked to the ALM web-site, which will serve as a hub for the GEF's adaptation learning programme, as well as to existing and planned WHO web-based fora on climate change and health, providing an alternate entry point for the health community.

*Output 4.2: Best practices and lessons learned exchanged among countries*

128. The project will support direct exchanges of lessons related to adaptation to climate change in the health sector through regional and global workshops and exchange visits. In doing so, the project will make use of the ALM Lessons Learned template. The national project management arrangements define responsibilities for project implementation, and these responsibilities identify the analysis and documentation of lessons. WHO will ensure that the ALM is informed of such lessons.

*Output 4.3: Revision of guidance documents for GEF and WHO on climate change adaptation programming in the health sector*

129. The original rationale for the project acknowledged that adaptation to climate change is a global issue that involves the entire health sector, and which requires appropriate policy responses at national and global levels. The project will generate guidance document both for the GEF, to highlight possible future areas of investment for UNDP and other development organization and for WHO and other relevant agencies, to improve the quality of policy advice available to health services around the globe.

**Summary of baseline and additional elements requiring GEF support to achieve Objective 4: Cooperation among participating countries promotes innovation in adaptation to climate change including variability**

<b>Country</b>	<b>Baseline elements</b>	<b>Additional elements (GEF funded)</b>
All	No international coordination or learning	Development and operation of project web site;

<b>countries</b>		Exchange of best practices and lessons learned making use of the ALM Lessons Learned template, the UNDP Treameworks mechanism and the WHO website; revision of guidance documents for GEF and WHO on climate change adaptation programming in the health sector
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## 2.4. Key indicators, risks and assumptions

### (i) Indicators

130. At the level of the project Objective, the indicator will rely on the Vulnerability Reduction Assessment (VRA) methodology, piloted in other GEF adaptation projects, such as the Community-based Adaptation Programme. This is also the recommended indicator in UNDP's global "Monitoring and Evaluation Framework for Adaptation" for Objective 3 (Adaptive Capacity: Capacity for surveillance of and prevention/ response to climate-sensitive diseases improved and/or expanded). The advantages of the VRA are:

- It is participatory, incorporating the views of key stakeholder groups, in this case, health professionals, regarding changes in their capacity to respond to climate-induced health issues
- It generates a unit-less index, which can therefore be used to measure and compare progress across different locations – in this case, across the seven countries and different sites within each country. This allows the project management team globally and within each country to practice adaptive management, utilizing regular assessments of changes in VRA to identify required modifications in the project strategy so as to maximize impact.

131. The indicator is therefore: Capacity to respond to climate-sensitive health risks, based on changes in the Vulnerability Reduction Assessment as determined by health sector personnel, with the target being: 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. These target values imply that healthcare providers across all countries consider that their capacity to handle climate-induced health risks has improved by at least 30%, and even in the least successful country, the improvement is half this figure.

132. At the level of the four Outcomes, the indicators are:

Outcome 1: Correlation of predictions with subsequent incidences of climate-sensitive health risks. The target figure for this indicator is: The correlation coefficient for the last three years of project implementation is 30% better than the baseline values.

Outcome 2:

(a) Proportion of District Health managers who consider that their response plan based on the relationship between climate and climate-sensitive health risk early warnings enables them to initiative effective responses. The target figure for this indicator is that by the end of the project at least 90 % of District Health managers consider that their response plan enables them to initiative effective responses

(b) Proportion of District Health managers who consider that inter-agency and inter-sectoral barriers are not important in delivering effective responses. The target figure for this indicator is that 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

Outcome 3: Proportion of districts implementing a locally appropriate control intervention (as determined by local healthcare practitioners) within a predefined interval appropriate to the health hazard (e.g. within hours for GLOFs in Bhutan or floods in Fiji, within 2 weeks of epidemic prediction/detection for malaria in Kenya) . The target figure for this indicator is: By the end of the project, at least 90% of districts implement planned response within the predefined period.

Outcome 4: Adoption or adaptation of practices piloted through the project. The target figure for this indicator is: By the end of the programme, 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.



133. For more information, and for indicators at the level of Outputs, refer to the that is annexed in this project document.

#### **(ii) Key assumptions underlying the project design**

- Adaptive capacity, as perceived by health-care personnel will have real impacts in terms of improved treatment of climate-sensitive health risks
- Three years' worth of data is sufficient to validate the early warning system against intra or inter-annual climate and disease variability (i.e. accuracy in predicting which days, weeks, months or years have higher or lower risk, with timescales dependant on the specific risk being assessed).
- All local health facilities have necessary tools and capacity for timely reporting
- Ministry of Health supports action to clarify mandates and simplify procedures, and acts promptly
- Willingness of district staff to undertake additional responsibilities permits rapid development of plans
- The length of project implementation is sufficient to demonstrate effective responses to climate-sensitive health risks
- Projects are under implementation long enough for lessons to be transferred to other countries before the end of the programme

134. Risks, which are outside the control of the project itself, include:

- National/international Meteorological Agencies continue to prioritize the maintenance of reliable data collection and reporting, and have adequate budgetary resources to support these activities
- Staffing levels and training provision for District Health managers are maintained or improved
- Turnover of staff does not negate benefits of training
- National and international agencies maintain or improve provision of resources to control targeted health issues
- GEF and WHO continue to target adaptation to climate change including variability in the health sector
- Standard WHO and UNDP management and oversight procedures are sufficient to ensure that project resources and effort are not compromised or diverted by poor governance and corruption, or are at any risk of undermining human rights.

135. None of these risks are considered to be "high". The most serious risk, rated "Moderate", concerns the turnover of staff in national health systems, which may negate the benefits of training. As previously mentioned, the mitigation strategy to address this risk involves focusing not on training itself, but on establishing training syllabi and resources to permit training of health managers to be responsive to hanging climatic conditions.

136. All other risks are considered to be "Low", and do not warrant a mitigation strategy.

#### **(i) Conformity with GEF principles**

##### **2.5. Cost-effectiveness**

137. In terms of cost effectiveness, the project will deliver benefits to seven GEF-eligible countries through on-the-ground definition of long-term strategies for adaptation, and implementation of policy changes and specific intervention measures.

138. Within each country, cost effectiveness is expected by the proposed approach of complementing the existing baseline initiatives already undertaken by the government. This allows the project to allocate its funding effectively to address climate change-induced risks and additional capacity needs emerging to reduce vulnerabilities associated with those risks. Furthermore, the individual actions are extensions of public health interventions that are already known to be highly cost-effective (e.g. investment in heat-wave warning systems, or surveillance and response for malaria epidemics), to locations where climate change is either bringing health risks

for the first time, or intensifying existing risks. Multi-criteria analysis will be used as a tool during the implementation phase to assess each project intervention according to health benefits, as well as potential for positive effects on economic development, social capital and environmental management. Cost effectiveness will be used as one of the criteria. Effectiveness will be assessed according to the extent to which the project a) is financially sustainable and b) reduces vulnerability to climate variability and change.

139. The global approach, incorporating countries representing the most vulnerable global ecosystems, and with more than one country representing each system, will increase the cost-effectiveness of the project compared with an alternative approach lacking these features. Cost-effectiveness is increased by these projects being integrated with WHO and UNDP global and regional programmes, providing an efficient route for two-way sharing of information and experience, including with neighbouring countries and those with similar climatic, ecological and socioeconomic conditions. The project will be linked to the other objectives of the WHO global workplan on climate change and health (advocacy, evidence and partnerships), and to similar country projects coordinated from regional offices (e.g. seven country projects on health adaptation to climate change in the Central Asian Republics coordinated by the WHO European Regional Office

## 2.6. Sustainability

140. The concept of sustainability differs for adaptation to climate change projects, compared with other types of GEF-funded projects. This is because adaptation projects seek to raise the adaptive capacity to long-term climate change. Consequently, raised adaptive capacity automatically implies sustainability. Of greater concern is the risk that the raised adaptive capacity is eroded over time such that as the impacts of climate change are experienced, the benefits secured through the GEF project are not realized. To avoid this situation, the project design relies on the following elements:

- A commitment to long-term planning at all levels, from strategies (such as promotion of intersectoral decision-making through intersectoral fora), to policies (such as health-sensitive water-policies), to specific measures (such as pre-defined action plans for dealing with outbreaks of water-borne disease).
- Building of multisectoral teams, to allow climate-change adaptation to be integrated into planning in a wide range of sectors;
- Explicit consideration of costs and benefits, with endorsement of strategies, policies and measures only if they can be expected to provide overall net benefits to health, and sustainable development;
- Commitment to continuous monitoring and regular evaluation of interventions over time; and
- Inclusion of awareness-building and fund-raising amongst national and international agencies and donors as a core activity.

## 2.7. Replicability

141. Climate change adaptation, and specifically health adaptation are at an early stage of development. This project is therefore explicitly designed to pilot adaptation in a few developing countries subject to the broadest possible range of climatic vulnerabilities to different kinds of health risks, but which have reasonable capacity in terms of infrastructure and human resources. Once these adaptation approaches are better defined, the project has the long-term aim of 'rolling out' these methods to other countries facing similar stresses, but with fewer resources, particularly the Least Developed Countries in Africa.

142. The design and eventually lessons learnt from the project will contribute to further adaptation learning, and implementation of effective climate change adaptation in other vulnerable countries<sup>4</sup>. The project will make use of the GEF Adaptation Learning Mechanism, to ensure that the lessons learnt from the project contribute to, and benefit from, experience in adapting to climate change across the whole of the GEF portfolio.

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<sup>4</sup> As an added benefit, the project will contribute to the development of the Adaptation Policy Frameworks for climate change developed by UNDP-GEF and partners, as well as the update of the WHO guidelines on "Methods of assessing human health vulnerability and public health adaptation to climate change", to be completed in 2010.

## 2.8 Stakeholder involvement plan

### Barbados

<i>Organization</i>	<i>Role in Project</i>
Ministry of Health	Implementation and coordination of 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 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
United Nations Development Programme	Programmatic support and monitoring and evaluation

### Bhutan

<i>Organization</i>	<i>Role in Project</i>
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 monitors the 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

<i>Organization</i>	<i>Role in project</i>
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 road 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

<i>Organization</i>	<i>Role in project</i>
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, climatic 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

<i>Organization</i>	<i>Role in Project</i>
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 (JSSD)	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 Environmental Health Activities	Technical guidance and review to ensure effectiveness in health protection, linkage with MoH, technical monitoring and evaluation
UNDP Jordan country office	GEF implementing agency; Programmatic oversight for project implementation

## Kenya

<i>Organization</i>	<i>Role in Project</i>
Ministry of Health (MOH)	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 for identification, preparation and response to highland malaria epidemics
World Health Organization (Kenya Country Office)	Provide overall WHO technical linkage with MOH in the project management
	Provide support on WHO technical linkage with MOH in the project management
Population Service International (PSI)-Kenya Country Office	Promote social marketing of ITNs to the target communities within the Kenyan highlands
Ministry of Environment	Being the local focal agent for UNFCCC will provide and guide on compliance to UNFCCC project implementation guidelines
Moi/Kenyatta University	Provide overall insights into re-shaping of the National HMIS focus on utility of data for decision-making within the project cycle.
	Provide overall insights into National policy review in relation to climate-sensitive health risks related to malaria
	Provide overall insights into Behavioural Change Communication (BCC) principles for operational adoption in the project
UNDP	Provide performance feedback from scheduled reports as part of project monitoring efforts to ensure successful implementation
Kenya Meteorological Dept	Provide climate-sensitive health risk data (temperature, humidity and rainfall) for ultimate correlation matrix development within the project
IGAD Centre on Climate Outlook	Provide wider picture of the weather outlook in the Great Horn of Africa for possible triangulation with KMD data

## Uzbekistan

<i>Organization</i>	<i>Role in project</i>
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 the climate variability and change. It will be responsible for delivering outputs to all project activities related to respective 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 and warning about any possible manifestations of climate variability 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 that will be established within the project
<b>Hydro-meteorological Research Institute (NIGMI)</b>	Research of climate change observations, research of the statistical interrelations between climate and population health.
<b>State Committee of the Republic of Uzbekistan for Nature Protection (Goskompriroda)</b>	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 reducing anthropogenic influence on the environment
<b>Ministry of Emergency</b>	Implementing communication in case of natural disasters

### 3. Project Results Framework<sup>5</sup>

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD: <i>Not Applicable</i>					
Country Programme Outcome Indicators: <i>Not Applicable</i>					
Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): <b>Promote climate change adaptation</b>					
Applicable SOF (e.g. GEF) Strategic Objective and Program: <i>Special Climate Change Fund</i>					
Applicable SOF (e.g. GEF) Expected Outcomes: <i>Strengthened institutional capacity to implement adaptation measures; Adaptation practices developed and implemented to respond to climate change-induced stresses linked to developed sectors (taken from GEF/R.5/12/Rev.2 (Draft, August 25, 2009))</i>					
Applicable SOF (e.g. GEF) Outcome Indicators: <b>Not defined by the GEF/SCCF</b>					
	Indicator	Baseline	Targets End of Project	Source of verification	Risks and Assumptions
	Capacity to respond to climate-sensitive health risks, based on changes in the Vulnerability Reduction Assessment as determined by health sector personnel	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	Adaptive capacity, as perceived by health-care personnel will have real impacts in terms of improved treatment of climate-sensitive health risks
	Correlation of predictions with subsequent incidences of climate-sensitive health risks	Correlation coefficient calculated from historical data: $\rho_{x,y}$ = baseline	Correlation coefficient for the last three years of project implementation: $\rho_{x,y}$ = 1.3(baseline)	Historical and current statistics of climate-sensitive health problems and climatic data	Three years' worth of data is sufficient to show statistically valid changes in correlation coefficient and climatic data
	Proportion of health care facilities in districts X, Y, Z reporting climate-sensitive health risk data on a weekly basis	X % of health care facilities currently report on weekly basis	By the end of the project at least 90 % of health care facilities report on weekly basis	Ministry of health records	All local health facilities have necessary tools and capacity for timely reporting
	Proportion of sites for which relative meteorological information is available within 1 week	Climate data currently available within 1 week for X % of sites	By the end of the project climate data available for all districts	Weekly weather reports from early warning sentinel sites, or from satellite data	National/international Met. Agencies maintain reliable data collection and reporting
	Proportion of District Health managers who consider that their response plan based on the relationship between climate and climate-sensitive health risks	X % of District Health managers consider that their response plan enables them to initiate effective responses	By the end of the project at least 90 % of District Health managers consider that their response plan enables them to initiate effective responses	Focus groups, interviews for District Health managers, inspection of response plans by MOH and WHO in all of districts	Staffing levels and training provision for District Health managers are maintained or improved
	<b>Outcome 1</b> An early warning system provides reliable information on likely incidence of climate-sensitive health risks				
	<b>(equivalent to activity in ATLAS)</b>				
	<b>Outcome 2: Health sector</b>				

<sup>5</sup>Based on country proposals from the PDF phase, indicators have been designed to capture measures of success that are applicable across the range of participating countries and health risks. Refinement of these indicators and assessment of baseline levels will take place at the project inception workshops in each country.

<p>institutions have the capacity to respond to climate-sensitive health risks based on early warning information (equivalent to activity in ATLAS)</p>	<p>sensitive health risk early warnings enables them 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>	<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 that inter-agency and inter-sectoral barriers are not important in delivering effective responses</p>	<p>Focus groups, interviews for District Health managers, inspection of response plans by MoH and WHO in all of districts</p>	<p>Institutional change does not negate the benefits from project interventions designed to overcome inter-agency and inter-sectoral barriers</p>
<p><b>Outcome 3: Disease prevention measures piloted in areas of heightened health risk due to climate change</b>  (equivalent to activity in ATLAS)</p>	<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>	<p>Over last 5 years, average of X % of districts implemented planned response within a pre-defined appropriate response period</p> <p>No response plan in pilot districts</p> <p>No cross-border learning</p>	<p>By the end of the project, at least 90% of districts implement planned response within a pre-defined response period, defined for each disease outcomes at project outset.</p> <p>Within 6 months of the start of project implementation, response plans have been formulated in all pilot districts</p> <p>By the end of the programme, 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</p>	<p>District level activity reporting to Ministry of Health, verified by field visits to all districts, assessed over 5 years</p> <p>Project documented plans</p> <p>Project reports, response</p>	<p>National and international agencies maintain or improve provision of resources to control health issues</p> <p>Willingness of district staff to undertake additional responsibilities permits rapid development of plans</p> <p>Projects are under implementation long enough for lessons to be transferred to other countries before the end of the programme</p>
<p><b>Outcome 4: Cooperation among participating countries promotes innovation in adaptation to climate change including variability</b>  (equivalent to activity in ATLAS)</p>	<p>Use and value of web site</p> <p>Documented project experiences in ALM and UNDP teamworks guide future GEF, SCCF, UNDP and WHO interventions on adaptation to climate change including variability</p>	<p>No web site exists</p> <p>Initial WHO guidance developed without benefits of practical experiences in adaptation to climate change including variability</p>	<p>Within 1 month of the start of implementation, a publicly accessible web-site has been created; at the end of the project, a survey of stakeholders in each country reveals that at least 60% used the web-site regularly to learn about progress in the project</p> <p>At the time of project completion, draft documents have been prepared to guide future UNDP and WHO support for interventions on adaptation to climate change including variability</p>	<p>Project reports and survey of stakeholders as part of the final evaluation</p> <p>Project reports, interviews with GEF Secretariat, UNDP, and WHO personnel</p>	<p>Technical capacity to prepare a website exists</p> <p>GEF, UNDP and WHO continue to target adaptation to climate change including variability in the health sector</p>



#### 4. Total budget and workplan

<b>Award ID:</b>	00058229	<b>Project ID(s):</b>	00072257.
<b>Award Title:</b>	WHO/UNDP global climate change health		
<b>Business Unit:</b>	UNDP1		
<b>Project Title:</b>	Piloting climate change adaptation to protect human health		
<b>PIMS no.</b>	3248		
<b>Implementing Partner (Executing Agency)</b>	World Health Organization		

SOF (e.g. GEF) Outcome/Atlas Activity	Responsible Party/Implementing Agent	Fund ID	Donor name	Budgetary Account Code	Atlas budget description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total
Outcome 1: An early warning and response system with timely information on likely incidence of climate-sensitive health risks established	WHO	62180	GEF (SCCF)	71200	International Consultants	41,000	22,000	27,000	22,000	112,000
				71300	Local consultants	200,000	100,000	51,000	43,000	394,000
				71600	Travel	21,000	21,000	20,000	19,000	81,000
				72200	Equipments and Furniture	51,000	18,000	4,000	4,000	77,000
				72500	Supplies	22,000	21,000	22,000	22,000	87,000
				74100	Professional Services	4,000	2,000	2,000	1,000	9,000
				74500	Miscellaneous	5,000	4,000	4,000	4,000	17,000
				75700	Training, meetings and workshops	83,000	103,000	95,000	88,000	369,000
<b>Total Outcome 1</b>						<b>427,000</b>	<b>291,000</b>	<b>225,000</b>	<b>203,000</b>	<b>1,146,000</b>
Outcome 2: Capacity of health sector institutions to respond to climate-sensitive health risks based on early warning information improved	WHO	62180	GEF (SCCF)	71200	International Consultants	24,000	11,000	11,000	14,000	60,000
				71300	Local consultants	121,000	80,000	65,000	60,000	326,000
				71600	Travel	16,000	16,000	15,000	15,000	62,000
				72100	Contractual Services	5,000	17,000	21,000	10,000	53,000
				72200	Equipments and Furniture	108,000	30,000	22,000	20,000	180,000
				72500	Supplies	3,000	3,000	2,000	2,000	10,000
				74100	Professional Services	5,000	4,000	3,000	3,000	15,000
				74500	Miscellaneous	3,000	2,000	2,000	2,000	9,000



	Year 1 (USD)	Year 2 (USD)	Year 3 (USD)	Year 4 (USD)	Total (USD)
<b>Grant</b>					
Global Environmental Facility	1,589,000	1,129,000	905,000	877,000	4,500,000
<b>Co-Financing</b>					
Government of Barbados	317,000	334,000	334,000	334,000	1,319,000
Government of Bhutan	12,000	18,000	14,000	8,000	52,000
Government of China	430,000	386,000	384,000	387,000	1,587,000
Fiji Ministry of Health	181,000	182,000	181,000	181,000	725,000
Fiji Meteorological Service	18,000	17,000	18,000	18,000	71,000
Fiji Dept of Environment	481,000	480,000	481,000	481,000	1,923,000
Fiji Ministry of Works	3,000	3,000	2,000	2,000	10,000
Government of Jordan	885,000	885,000	885,000	885,000	3,540,000
Government of Kenya	84,000	42,000	42,000	42,000	210,000
DFID and Gates Foundation (through WHO Kenya)	525,000	525,000	525,000	525,000	2,100,000
German Environment Ministry (through WHO-EURO)	700,000	700,000	0	0	1,400,000
WHO Centre for Environmental Health Activities	410,000	482,000	387,000	252,000	1,531,000
Pan-American Health Organization/WHO	120,000	105,000	105,000	105,000	435,000
World Health Organization Headquarters	469,000	424,000	409,000	454,000	1,756,000
<b>Total</b>	<b>6,125,000</b>	<b>5,664,000</b>	<b>4,742,000</b>	<b>4,627,000</b>	<b>21,158,000</b>

## 5. Management Arrangements

143. UNDP will function as the GEF Implementing Agency for this global project. Project delivery will be expected to be carried out according to the GEF Council approved global project objective and outcomes, detailed in the project's Key Results Framework (Logical Framework), upon which the national Annual Workplans (AWPs) and related budgets will be based. The role of UNDP at HQ, Regional Centres, and/or Country Offices, as appropriate, is outlined in the Delegation of Authority to be issued from UNDP to WHO prior to implementation. UNDP receives a fee directly from the GEF Secretariat for project cycle management services as described in the final CEO endorsement letter sent to UNDP/BDP/EEG.

144. Successful execution of the project will require the establishment of an efficient global management structure, complemented by efficient national management structures. WHO will execute the project and will manage disbursement of project resources to its regional and country offices and report back to UNDP on expenditures as well as key results on a quarterly and annual basis as per the terms of the Executing Agency Agreement between UNDP and the World Health Organization. UNDP/GEF financial accounting and reporting requirements will be expected to be fully met. A 7% execution fee will be charged to the project budget by WHO for such services.

145. At the country level, an advisory committee made up of key stakeholders will oversee project implementation. The Ministry of Health is expected to chair the project advisory committee, to identify a key person or persons who will have primary project responsibility for country level project activities, and to carry out or otherwise coordinate the country level activities, financed with project resources.

146. UNDP country offices will participate in the project advisory committee in each country, and contribute towards coordination of this project with other UN/UNDP initiatives on climate change adaptation within the country. Per UNDP financial regulations and rules, UNDP country offices will fully recover costs associated with specific services and/or requests related to either financial or substantive reporting as and when requested by WHO Country Offices and which are over-and above its role on project cycle management services. WHO country offices will participate in the project advisory committee, and contribute 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. Costs incurred by WHO in carrying out these roles will be covered by the execution fee referenced in paragraph 144 as well as WHO in-kind co-financing.

147. This execution modality is followed in order to promote the following:

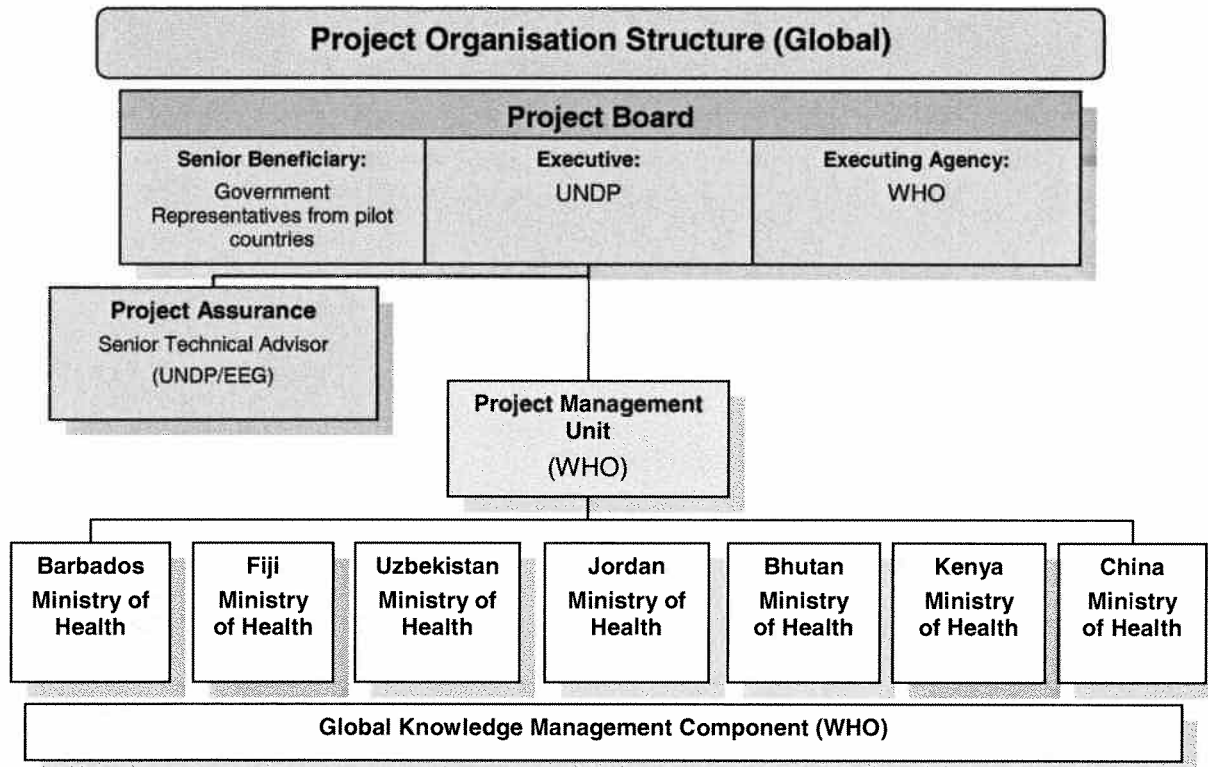
- Enhanced integration and synergy with existing climate change and health related global programs led by WHO and other development-orientated adaptation projects supported by UNDP through greater use of appropriate global systems and procedures.
- Promote greater national self-reliance through effective use of, and, as required, strengthening of, technical expertise of national health institutions, through a 'learning by doing' approach;
- Enhanced sustainability of the project outcomes through an increased sense of national ownership and commitment to climate change adaptation and inherent development objectives of the project;

148. Ultimately, this approach is expected to maximize, at the national level, integration of the global project's national activities into national poverty reduction strategies in support of the Millennium Development Goals (MDGs).

149. Any project audit will be subject to established WHO standards and practices. WHO shall furnish to UNDP, promptly upon its becoming available, a copy of WHO's Interim Financial Report issued at the end of the first year of a biennium, or its Financial Report and Audited Financial Statements, and the Report of the External Auditor to the World Health Assembly, issued at the end of a biennium and covering the full biennium, as the case may be.

150. In order to accord proper acknowledgement to UNDP for its role as implementing agency, GEF for providing funding, WHO for executing the project, a logo with UNDP, GEF and WHO should appear on all relevant project

publications, including among others, project hardware and vehicles purchased with SCCF funds subject to internal clearances. Any citation on publications and communications materials should also accord proper acknowledgment to UNDP, GEF and WHO.



151. A Global Project Board (comprised of UNDP/EEG/GEF (HQ) (as Chair), WHO and Representatives of the Ministry of Health in each of the pilot countries) is to be established..

152. The Project Board is the group responsible for making by consensus, management decisions for a project when advice is required by the WHO Project Manager, including recommendation for WHO approval of project plans and revisions. In order to ensure UNDP’s ultimate accountability, Project Board decisions should be made in accordance to standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition. In case a consensus cannot be reached within the Board, final decision shall rest with the UNDP Programme Manager.

153. Potential members of the Global Project Board are reviewed and recommended for approval during the PAC meeting. Representatives of other stakeholders can be included in the Board as appropriate. The Board contains three distinct roles, including:

- 1) UNDP will serve as the “Executive” representing the project ownership and interests of the GEF Council and will chair the Board.
- 2) WHO will serve as the executing agency, and the technical expertise to the project. WHO’s primary function within the Board is to report on that statues of project execution, and to provide guidance regarding the technical soundness of the project.

- 3) The Senior Beneficiaries will be representatives of the Ministry of Health in the countries participating in this project. They will represent the interests of those who will ultimately benefit from the project. The Senior Beneficiaries primary function within the Board is to ensure the realization of project results from the perspective of project beneficiaries.
- 4) The Senior Technical Advisor (STA) for Climate Change Adaptation within the Environment and Energy Group at UNDP will undertake the **Project Assurance** role. The STA can, if necessary and upon agreement with the UNDP CO delegate the same to designated representative at the UNDP CO. The STA supports the Project Board Executive by carrying out objective and independent project oversight and monitoring functions.

## 6. Monitoring Framework and Evaluation

154. The project will be monitored through the following M& E activities. The M& E budget is provided in the table below.

### Project start:

155. A Project Inception Workshop will be held within the first 2 months of project start with those with assigned roles in the project organization structure, UNDP and WHO country office and where appropriate/feasible global/regional technical policy and programme advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

156. The Inception Workshop should address a number of key issues including:

- a) Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of WHO Country Offices, UNDP Country Offices and UNDP and WHO regional staff vis à vis the project team. The meeting will include discussions of the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed and refined as needed.
- b) Based on the project results framework, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
- c) Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be reviewed, agreed and scheduled.
- d) Discuss financial reporting procedures and obligations, and arrangements for quarterly reporting and annual audits including UNDP annual Project Implementation Reviews (PIRs).
- e) Plan and schedule Project Board meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first Project Board meeting should be held within the first 3 months following the inception workshop.

157. An Inception Workshop report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

### Quarterly:

- Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform. Relevant WHO oversight staff and/or the PM will need to make available relevant information.
- Based on the initial risk analysis submitted, the risk log shall be regularly updated by the project and WHO staff, keeping UNDP informed of all changes so that they can be reflected in UNDP reporting tools such as ATLAS. Risks become critical when the impact and probability are high. Note that for UNDP GEF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes, or capitalization of ESCOs

are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).

- Based on the information recorded in Atlas, UNDP, with the support of project staff, will generate a Project Progress Reports (PPR) can be generated in the Executive Snapshot.

**Annually:**

- Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements.

The APR/PIR includes, but is not limited to, reporting on the following:

- Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
- Project outputs delivered per project outcome (annual).
- Lesson learned/good practice.
- AWP and other expenditure reports
- Risk and adaptive management
- ATLAS QPR
- Portfolio level indicators (i.e. GEF focal area tracking tools) are used by most focal areas on an annual basis as well.

158. The WHO project team will prepare drafts of these reports, to be finalized by WHO in consultation with UNDP-HQ.

**Periodic Monitoring through site visits:**

159. WHO CO, together with UNDP, will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the Project Board (or their representatives) may also join these visits. A Field Visit Report/BTOR will be prepared by the WHO CO and relevant Regional Staff will be circulated no less than one month after the visit to the project team and Project Board members.

**Mid-term of project cycle:**

160. The project will undergo an independent Mid-Term Evaluation at the mid-point of project implementation (insert date). The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by WHO (Geneva) based on guidance from the UNDP-EEG. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the UNDP Evaluation Office Evaluation Resource Center (ERC).

161. The relevant GEF/Adaptation Tracking Tools will also be completed during the mid-term evaluation cycle.

**End of Project:**

162. An independent Final Evaluation will take place three months prior to the final Project Board meeting and will be undertaken based on UNDP and GEF guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development

and the achievement of adaptation benefits. The Terms of Reference for this evaluation will be prepared by the WHO (Geneva) based on guidance from the UNDP-EEG.

163. The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Center (ERC).

164. The relevant GEF/Adaptation Tracking Tools will also be completed during the final evaluation.

165. During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objective, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

**Learning and knowledge sharing:**

166. Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums. A detailed plan for disseminating results will be developed within the first 2 months of project implementation, in consultation with relevant parties including the project management unit of UNDP's Adaptation Learning Mechanism.

167. The project will identify, as relevant and appropriate, scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

168. Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding project team staff time</i>	Time frame
Inception Workshop and Report	<ul style="list-style-type: none"> <li>▪ Project Manager</li> <li>▪ WHO (Geneva)</li> </ul>	30,000	Within first two months of project start up
Measurement of Means of Verification of project results.	<ul style="list-style-type: none"> <li>▪ WHO Regional Advisor/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members.</li> </ul>	160,000	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on <i>output and implementation</i>	<ul style="list-style-type: none"> <li>▪ Oversight by Project Manager</li> <li>▪ Project team</li> </ul>	To be determined as part of the Annual Work Plan's preparation.	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	<ul style="list-style-type: none"> <li>▪ Project manager and team</li> <li>▪ WHO (Geneva)</li> <li>▪ UNDP EEG</li> </ul>	None	Annually
Periodic status/ progress reports	<ul style="list-style-type: none"> <li>▪ Project manager and team</li> </ul>	None	Quarterly



Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding project team staff time</i>	Time frame
Mid-term Evaluation	<ul style="list-style-type: none"> <li>▪ Project manager and team</li> <li>▪ WHO (Geneva)</li> <li>▪ External Consultants (i.e. evaluation team)</li> </ul>	50,000	At the mid-point of project implementation.
Final Evaluation	<ul style="list-style-type: none"> <li>▪ Project manager and team,</li> <li>▪ WHO (Geneva)</li> <li>▪ External Consultants (i.e. evaluation team)</li> </ul>	40,000	At least three months before the end of project implementation
Project Terminal Report	<ul style="list-style-type: none"> <li>▪ Project manager and team</li> <li>▪ UNDP CO</li> <li>▪ local consultant</li> </ul>	25,000	At least three months before the end of the project
Audit	<ul style="list-style-type: none"> <li>▪ UNDP CO</li> <li>▪ Project manager and team</li> </ul>	5,000	Yearly
Visits to field sites	<ul style="list-style-type: none"> <li>▪ WHO (Geneva)</li> <li>▪ UNDP EEG</li> </ul>	25,000	Yearly
<b>TOTAL indicative COST</b> Excluding project team staff time and WHO/UNDP staff and travel expenses		US\$ 335,000	

## 7. Legal Context

169. This project forms part of an overall programmatic framework under which several separate associated country level activities will be implemented. When assistance and support services are provided from this Project to the associated country level activities, this document shall be the "Project Document" instrument referred to in: (i) the respective signed SBAs (Standard Basic Assistance Agreement) for the specific countries; or (ii) in the Supplemental Provisions attached to the Project Document in cases where the recipient country has not signed an SBA with UNDP, attached hereto and forming an integral part hereof.

170. The responsibility for the safety and security of the Implementing Partner and its personnel and property, and of UNDP's property in the Implementing Partner's custody, rests with the Implementing Partner. The Implementing Partner shall: (a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried; (b) assume all risks and liabilities related to the Implementing Partner's security, and the full implementation of the security plan. UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

171. The Implementing Partner agrees to undertake all reasonable efforts to ensure that none of the project funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via

<http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm>. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

## 8. Annexes

### Risk Analysis

Use the standard UNDP Atlas [Risk Log template](#). For UNDP GEF projects in particular, please outline the risk management measures including improving resilience to climate change that the project proposes to undertake.

<b>Project Title:</b>	<b>Award ID:</b>	<b>Date:</b>
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#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Update	Status
1	Adaptive capacity, as perceived by health-care personnel is not closely related to improved treatment of climate-sensitive health risks	Project design phase (September 2009)	Operational	This would undermine the impact of the project in achieving true health gains - but would also provide valuable lessons for the future.  P = 1 I = 4	Integration of the monitoring and evaluation systems for this project with disease surveillance systems should over time allow correlation of adaptive capacity with health metrics	Task Manager, UNDP/GEF	Task Manager, UNDP/GEF	4 Sep 09	
2	Duration of project may not be sufficient to validate warning systems and allow sharing of lessons learned	Project design phase (September 2009)	Operational	This would decrease the robustness and impact of lessons learned from the project. P = 1 I = 3	Project has been planned with realistic timescale, interim deadlines will be strictly enforced	Task Manager, UNDP/GEF	Task Manager, UNDP/GEF	4 Sep 09	
3	Ministry of Health and other agencies may not maintain political and in-kind support for project activities	Project design phase (September 2009)	Organizational	This would seriously undermine the delivery of the project objectives, as well as long-term sustainability  P = 1 I = 4	WHO and UNDP will continue to emphasize the high-level and project commitments made by Govt. agencies.	Task Manager, UNDP/GEF	Task Manager, UNDP/GEF	4 Sep 09	
4	Turnover of staff may negate benefits of training	Project design phase (September 2009)	Operational	This would degrade the long-term sustainability of the project  P = 3 I = 3	Emphasis on developing training materials, rather than heavy investment in individuals	Task Manager, UNDP/GEF	Task Manager, UNDP/GEF	4 Sep 09	
5	Political instability may make it impossible to work in one or more sites or countries	Project design phase (September 2009)	Political	This would cause failure or delays in implementation in one or more locations  P = 1 I = 2	Multi-country project means that implementation problems in one country will not completely undermine project.	Task Manager, UNDP/GEF	Task Manager, UNDP/GEF	4 Sep 09	

## Agreements

None

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**Key assessment reports**

*Annexed Country Reports*

*The reports provide details of planned country-level stakeholder involvement in various project activities.*

## Terms of Reference

*Draft Terms of Reference to be finalized following CEO endorsement*

<b>Post Information</b>	
Post Title: <b>Project Coordinator</b>	Current Grade:
Post Number:	Proposed Grade: L4
Organizational Unit:	Approved Grade:
Supervisor/ Grade: WHO/UNDP	Post Classified by:
Source of Funding: <b>UNDP/GEF Global Health Project</b>	Classification Approved by:
<b>Organizational Context</b>	
<p>The UNDP/GEF Global Health Project, executed by the World Health Organization is funded by the GE/Special Climate Change Fund. The project seeks increase adaptive capacity in 7 pilot countries to respond to climate-sensitive health risks" through the realization of the following key results: (a) An early warning and response system with timely information on likely incidence of climate-sensitive health risks established in the participating countries' (b) Capacity of health sector institutions to respond to climate-sensitive health risks based on early warning information improved; (c) Disease prevention measures piloted in areas of heightened health risk due to climate change; and (d) Cooperation among participating countries on innovative adaptation centric strategies, policies and measures are promoted. The project is implemented in Barbados, Bhutan, China, Fiji, Jordan, Kenya, Uzbekistan.</p> <p>The incumbent, working with a team of national coordinators in each of the 7 countries will support the implementation of the project, providing coordination and technical support services, and backstopping global functions including implementing a knowledge management strategy. S/he will provide technical support to national coordinators overseeing project activities (led by the Ministry of Health in each country), develop climate change adaptation related knowledge products that are of relevance to the health sector, lead learning activities, and coordinate all activities that lead to the realization of project outcomes/key results.</p> <p>The incumbent will liaise with internal and external partners to coordinate project operational issues and present substantive project results in national and international fora, as and when requested by UNDP/GEF.</p>	
<b>Functions / Key Results Expected</b>	
<b>Coordination of Project Outcomes</b>	
<ul style="list-style-type: none"> <li>• Liaising with National Coordinators on portfolio development and implementation, M&amp;E and other requirements</li> <li>• Providing technical support for country level activities that contribute towards project outcomes and outputs</li> <li>• Coordinating ongoing capacity building of country programs, including national coordinators, and other relevant stakeholders</li> </ul>	
<b>Global Knowledge/Information Management</b>	
<ul style="list-style-type: none"> <li>• Coordinating the development of climate change/adaptation related health knowledge management products</li> <li>• Developing specific knowledge products as agreed with the overall Task Manager at WHO</li> <li>• Assisting with mobilization of external resources required for KM and KM-related activities as required</li> <li>• Disseminating knowledge products internally and globally based on an agreed strategy</li> <li>• Maintaining a project website (including up-to-date information on projects, FAQ, and other information), database, budget, and other records</li> </ul>	
<b>Knowledge Management, Monitoring and Evaluation</b>	
<ul style="list-style-type: none"> <li>• Coordinate the fulfilment of monitoring requirements for SCCF funded country specific initiatives, ensuring quality of data entry into the relevant databases and ensuring that quality project progress</li> </ul>	



<p>reports are prepared by country specific teams</p> <ul style="list-style-type: none"> <li>• Review of Vulnerability Reduction Monitoring tools including H-forms, progress reports and associated project data, to serve in the development of case studies and other knowledge products</li> <li>• Consolidate quantitative and qualitative monitoring data, develop brief reports, and coordinate with knowledge sharing networks such as the Adaptation Learning mechanism;</li> <li>• Maintaining track of impact indicators on all project outcomes and outputs at both the national and global level</li> <li>• Generation and reporting of project implementation statistics as required by WHO and UNDP/GEF</li> <li>• Assist with the preparation and evaluation of midterm and final progress reports</li> <li>• Development of periodic thematic reports, and assistance on the development of the final lessons-learned publication</li> </ul>	
<p><b>Project Financial Management</b></p> <ul style="list-style-type: none"> <li>• Liaising with National Coordinators on knowledge, policy, and project-oriented budget requests and disbursements</li> <li>• Ensuring that a project shadow budget is maintained</li> <li>• Liaising with the implementing agency (UNDP) to ensure efficient delivery of timely and quality financial and substantive reporting products</li> </ul>	
<p><b>General Duties</b></p> <ul style="list-style-type: none"> <li>• Ensure coordination between project-related KM activities and other WHO and UNDP/GEF climate change adaptation knowledge management activities</li> <li>• Ensure coordination between the UNDP/GEF/WHO health project and other GEF/donor funded climate change adaptation related activities</li> <li>• Develop progress reports and steering committee briefing notes as required by WHO and UNDP/GEF</li> <li>• Perform other project-related duties as required by day-to-day TM at WHO</li> </ul>	
<p><b>Competencies</b></p> <ul style="list-style-type: none"> <li>• Understanding of health policy frameworks and related operational details</li> <li>• Technical knowledge of issues pertaining to the health sector from climate change science, climate change adaptation, community development, community-based natural resource management, ecosystem services, ecological impacts of climate change</li> <li>• Excellent communication skills and a demonstrated approach to practical problem solving</li> <li>• Ability to motivate and build a team working environment to support project and organizational goals.</li> <li>• Self motivated with an ability to accept responsibility and accountability for decisions and actions.</li> <li>• Ability to work long hours in fast-paced, often stressful environment.</li> <li>• Ability to work in multicultural context and undertake missions to developing countries</li> <li>• Highly motivated with a positive attitude and problem-solving approach.</li> <li>• Computer literacy and working knowledge of Microsoft Office programs, Geographic Information Systems, basic website maintenance and development</li> <li>• Familiarity with WHO, UNDP and GEF</li> <li>• Knowledge of and commitment to UN core values, rules and regulations.</li> </ul>	
<p><b>Recruitment Qualifications</b></p>	
<p><b>Education:</b></p>	<ul style="list-style-type: none"> <li>• Masters degree or higher in health, climate change, public policy, sociology, and/or economics</li> </ul>
<p><b>Competencies:</b></p>	<ul style="list-style-type: none"> <li>• Demonstrated ability to develop and maintain strategic partnerships;</li> <li>• Demonstrated leadership, facilitation and coordination skills;</li> <li>• Demonstrated entrepreneurial abilities and demonstrated ability to work in an independent manner;</li> <li>• Demonstrated ability to work in a team;</li> </ul>
<p><b>Experience:</b></p>	<ul style="list-style-type: none"> <li>• 10 years or more of progressively more responsible relevant leadership and</li> </ul>

	<p>management in the field of climate change adaptation and development</p> <ul style="list-style-type: none"> <li>• Extensive experience with project development, implementation and management (direct project management experience is preferable);</li> <li>• Experience in the policy development processes associated with environment and sustainable development issues;</li> <li>• Full computer literacy;</li> <li>• Working experience in an international organization is an advantage as is knowledge of UNDP policies, procedures and practices.</li> </ul>
<b>Language Requirements:</b>	<ul style="list-style-type: none"> <li>• Excellent command of written and spoken English is essential; working level proficiency in other UN languages is highly desirable.</li> </ul>

### **Administrative and Financial Assistant**

One administrative and financial assistant will report to PM.

#### **Responsibilities**

- Standardize the finance and accounting systems of the project while maintaining compatibility with the WHO and UNDP financial accounting procedures.
- Prepare budget revisions of the project budgets and assist in the preparation of the annual work plans.
- Comply and verify budget and accounting data by researching files, calculating costs, and estimating anticipated expenditures from readily available information sources, in particular partner agencies.
- Prepare status reports, progress reports and other financial reports.
- Process all types of payments requests for settlement purposes including quarterly advances to the partners upon joint review.
- Prepare periodic accounting records by recording receipts, disbursements (ledgers, cash books, vouchers, etc) and reconciling data for recurring or financial special reports and assist in preparation of annual procurement plans.
- Undertake project financial closure formalities including submission of terminal reports, transfer and disposal of equipment, processing of semi-final revisions, and support professional staff in preparing the terminal assessment reports.
- Assist in the timely issuance of contracts and assurance of other eligible entitlements of the project personnel, experts, and consultants by preparing annual recruitment plans.

Additional project staff may be recruited based on needs as determined by the Project Manager and approved by the Project Board. Recruitment of such project staff will follow WHO procedures.

**Capacity Assessment**

*None*

**Special Clauses**

*None*

**SIGNATURE PAGE**

**Country:**

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**UNDAF Outcome (s)/Indicator (s):**

**CPAP Outcome (s)/Indicator (s):** National capacities are strengthened to mainstream climate change policies into national development plans (BDP Outcome 62)

**CPAP Output (s)/Indicator (s):** n/a

**Executing Entity/Implementing Partner:** World Health Organization (WHO)

**Implementing entity/Responsible Partner**

Programme Period:	4 years	Total resources required	\$21,159,000
Atlas Award ID:	00058229	Total allocated resources:	\$21,159,000
Project ID:	00072257	• Regular	
Atlas BU:	UNDP1	○ Other:GEF(SCCF)	\$ 4,500,000
PIMS #	3248	○ Government (inkind)	\$12,937,000
Start date:	Jan 2010	○ Other (WHO; inkind)	\$ 3,722,000
End Date	Dec 2013	In-kind contributions	\$16,659,000
Management Arrangements	Agency Implementation		

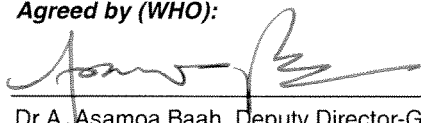
**Agreed by (Government):**

N/A

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NAME	SIGNATURE	Date/Month/Year
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**Agreed by (WHO):**



Dr A. Asamoah Baah, Deputy Director-General

SIGNATURE

14/5/2010

Date/Month/Year

**Agreed by (UNDP):**

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NAME	SIGNATURE	Date/Month/Year
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