



Climate Change and Groundwater – what tools under the UNFCCC?

M. J. Mace, SOAS
mm128@soas.ac.uk

Conference on Groundwater and Climate Change
23 January 2014

Convention

Article 4.1

- **All Parties**, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, **shall**:

- (b) **Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures** to mitigate climate change . . . and measures **to facilitate adequate adaptation** to climate change
- (c) **cooperate in preparing for adaptation to the impacts of climate change; develop and elaborate appropriate and integrated plans** for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification as well as floods

Convention

Article 4.3

- Developed countries to provide ***new and additional financial resources*** to meet the ***agreed full costs*** incurred by developing countries in complying with their ***12.1 reporting obligations***.
- Developed countries also to provide “such resources for, including for the ***transfer of technology***, needed by the developing country Parties to meet the ***agreed full incremental costs of implementing measures*** under Article 4.1 [development of policies and measures on adaptation, mitigation]

Article 4.4

- Developed countries shall also assist developed country parties that are “*particularly vulnerable*” to the impacts of climate change in *meeting the costs of adaptation*

Article 4.5

- developed countries to take all practicable steps to promote, facilitate and finance, as appropriate, the *transfer of or access to* environmentally sound *technologies*

Types of tools

- **Commitments**

- Reporting by all Parties on implementation of Convention commitments
- Developed country support to developing countries through finance, technology transfer, capacity building, research and systematic observation

- **Planning processes**

- National Communications, sections on vulnerability and adaptation
- National Adaptation Programmes of Action (NAPAs) (LDCs)
- National Adaptation Plans (NAPs) (new) (LDCs and others)

- **Finance**

- Global Environment Facility (Financial Mechanism)
- Green Climate Fund (Financial Mechanism) (new)
- Adaptation Fund
- Least Developed Countries Fund
- Special Climate Change Fund

- **Information sharing and support:**
 - Adaptation Committee
 - Facilitate sharing of best practice, knowledge and experience
 - Recommendations on best adaptation technology practices
 - Required to develop linkages with Technology Executive Committee (and others)
 - Nairobi Work Programme on Impacts and Adaptation
 - “Action Pledges” from external organisations, NGOs, IGOs etc
 - Database on Local Coping Strategies
 - Database on Private Sector initiatives
 - Technology Mechanism (relatively new)
 - mandated to consider both adaptation and mitigation technologies
 - Consists of a Technical Executive Committee and a Climate and Technology Centre and Network (UNEP coordinates)
 - Warsaw Work Programme on Loss and Damage (new)
 - Mandated to help understand and reduce loss and damage associated with the adverse effects of climate change, including impacts related to extreme weather events and slow onset events, including “sea level rise, increasing temperatures, ocean acidification, glacial retreat and related impacts, salinization, land and forest degradation, loss of biodiversity and desertification”
 - Technical Papers

Example of planning processes: **NAPAs**

- Focus on the **urgent and immediate needs** of LDCs – those for which further delay could increase vulnerability or lead to increased costs at a later stage.
- Use **existing information**; no new research needed.
- Presented in a **simple format**, easily understood by policy-level decision-makers and the public.
- Focus on enhancing adaptive capacity to existing **climate variability**, to help address the adverse effects of climate change.
- **Stakeholder** process, take into account existing coping strategies at the **grassroots level, rather than scenario building**.
- ***Goal: to generate a list of priority areas and priority projects.***

1. Samoa NAPA – key issues

- High vulnerability to natural disasters (tropical cyclones, prolonged periods of drought, extreme flooding), pests, disease outbreak, storm surge, sea level rise
- 70% of population, infrastructure on low-lying coastal areas
- Forests assist in watershed management, but vulnerable to drought.



Samoa - Top 9 Priority Projects

No	Project		Cost (USD)
1.	Securing Community Water Resource	<ul style="list-style-type: none"> • Develop water purification programs for communities • Develop watershed management programme for (other) communities • Alternative water storage programs; • Restoration of coastal springs in communities 	505,000
2.	Reforestation, Rehabilitation & Community Forestry Fire Prevention	<ul style="list-style-type: none"> • Reforestation & Rehabilitation (sustainable forest management) • Forest Fire Prevention Program 	417,500
3.	Climate Health Cooperation Program	<ul style="list-style-type: none"> • Establish Climate-Health Cooperation Program 	620,000
4.	Climate Early Warning System	<ul style="list-style-type: none"> • Develop Climate Early Warning System and Emergency Measures 	4,000,000
5.	Agriculture & Food Security Sustainability	<ul style="list-style-type: none"> • Investment on annual crops and home vegetable farming • Alternative Farming Systems 	320,000

Samoa (2)

6.	Zoning & Strategic Management Planning	<ul style="list-style-type: none"> • Zoning, Disaster Planning & Urban Planning • Strengthening building codes resilient to cyclone 	400,000
7.	Implement Coastal Infrastructure Management Plans for Highly Vulnerable District	<ul style="list-style-type: none"> • Implement Coastal Zone Management • Coastal infrastructure protection (seawall) • Construction of seawalls (subject to existing plans and code) • Assistance for relocation of roads inland • Assistance for relocation of communities inland 	450,000
8.	Establishing Conservation Programs in Highly Vulnerable Marine & Terrestrial Areas of Communities	<ul style="list-style-type: none"> • Conservation Areas • Establish Marine Reserves • Marine & Terrestrial Conservation Areas (e.g. MPAs) 	350,000
9.	Sustainable Tourism Adaptation	<ul style="list-style-type: none"> • Sustainable Tourism – develop Tourism Environmental Policy 	250,000
	PIF approved: 'Integrated Climate Change Adaptation in Samoa'	LDCF: 2.25 million; co-financing 2 million	

2. Bangladesh NAPA – key issues

- Low-lying country
- 70% of land area is less than 1m above sea level; 80% is floodplain.
- Already prone to natural disasters, resulting in loss of life, property (cyclones and tidal surges)
- Increasing frequency, intensity of extreme weather events
- Sea level rise and increasing exposure of ground and surface waters to saline intrusion



news.bbc.co.uk/2/low/in_pictures/6742541.stm



Bangladesh – Top 15 Priority Projects

No	Project	Cost (\$US million)
1.	Reduction of climate change hazards through coastal afforestation with community participation (<i>intervention</i>) (<i>Expected: 3.74 million LDCF, 7.15 co-financing, total: 10.89</i>)	23.0
2.	Providing drinking water to coastal communities to combat enhanced salinity due to sea level rise (<i>intervention</i>)	1.5
3.	Capacity building for integrating CC in planning, designing of infrastructure, conflict management and land-water zoning for water management institutions	2.0
4.	CC and adaptation information dissemination to vulnerable community for emergency preparedness measures and awareness raising on enhanced climate disasters (<i>awareness and CB</i>)	7.0
5.	Construction of flood shelter, and information and assistance centre to cope with enhanced recurrent floods in major floodplains (<i>intervention</i>)	5..0

Bangladesh (2)

No	Project	Cost (\$US million)
6	Mainstreaming adaptation to CC into policies and programmes in different sectors (disaster management, water, agriculture, health and industry (<i>capacity building</i>))	1.0
7	Inclusion of climate change issues in curriculum at secondary and tertiary institutions (<i>awareness raising</i>)	0.5
8	Enhancing resilience of urban infrastructure and industries to impacts of climate change (<i>capacity building</i>)	2.0
9	Development of eco-specific adaptive knowledge (including indigenous knowledge) on adaptation to climate variability to enhance adaptive capacity for future climate change (<i>intervention</i>)	5.0
10	Promotion of research on drought, flood and saline tolerant varieties of crops to facilitate adaptation in future (<i>research</i>)	5.0

Synthesis of NAPAs -

May 2013

UNITED NATIONS
NATIONS UNIES



FRAMEWORK CONVENTION ON CLIMATE CHANGE - Secretariat
CONVENTION - CADRE SUR LES CHANGEMENTS
CLIMATIQUES - Secrétariat

NATIONAL ADAPTATION PROGRAMMES OF ACTION

Index of NAPA Projects by Sector

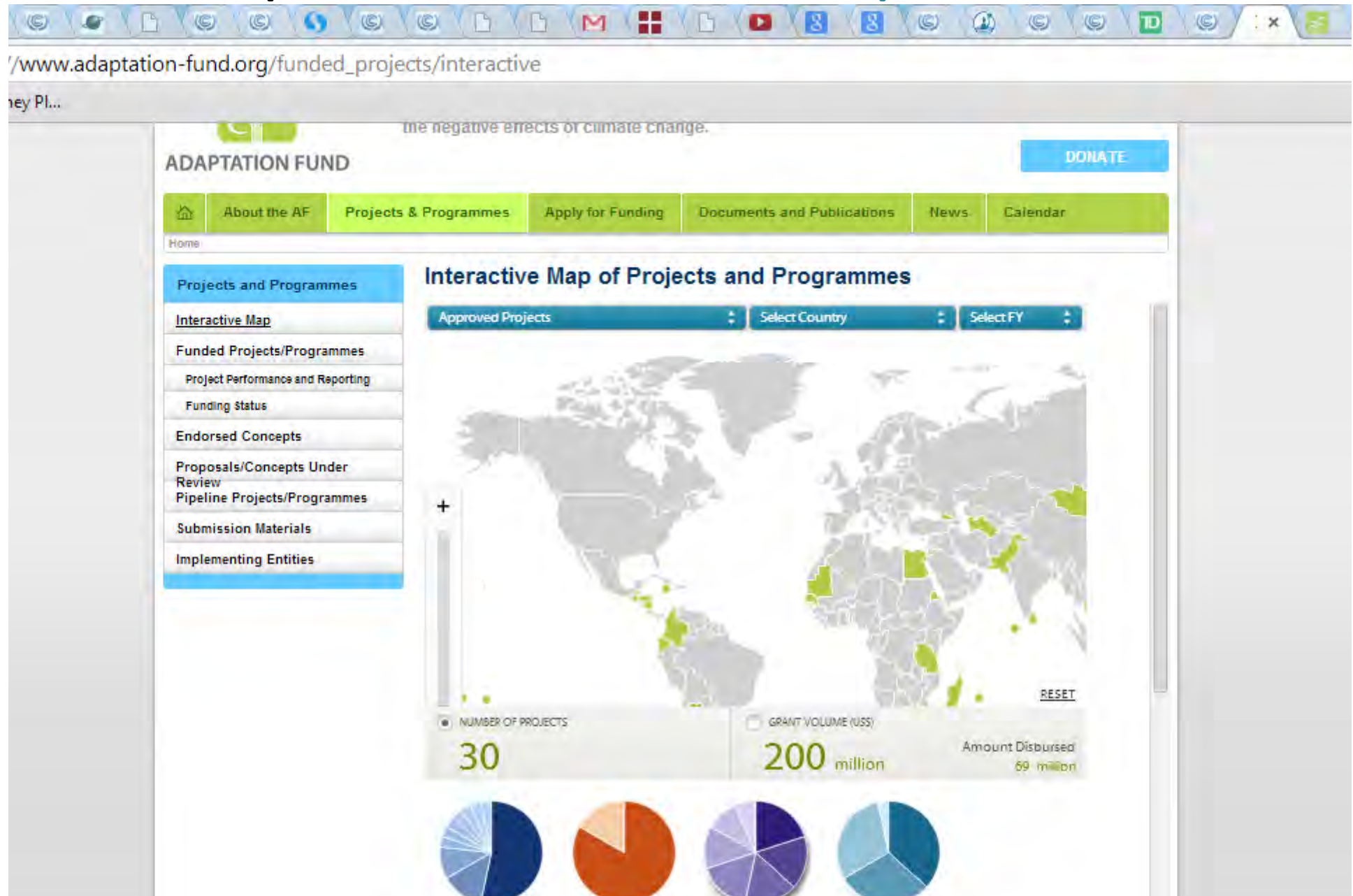
SECTOR	Page
CROSS-SECTORAL.....	1
FOOD SECURITY.....	4
COASTAL ZONES / MARINE ECOSYSTEMS.....	10
EARLY WARNING SYSTEMS AND DISASTER MANAGEMENT.....	13
EDUCATION / CAPACITY BUILDING.....	16
ENERGY.....	19
HEALTH.....	20
INFRASTRUCTURE.....	22
INSURANCE.....	24
TERRESTRIAL ECOSYSTEMS	24
TOURISM.....	29
WATER RESOURCES.....	29

May 2013

COUNTRY	Order of Project Priority	PROJECT TITLE	COST (USD)	COST (AUD)	SECTOR COMPONENT (S)
Afghanistan	1	Improved water management and use efficiency	2,200,000		Water management
Bangladesh	2	Providing drinking water to coastal communities to combat enhanced salinity due to sea level rise	1,525,000		Water Resource development
Benin	3	Exploitation of surface water as a means to adapt to climate change in the most vulnerable areas in the Centre and North Provinces	2,875,000		Surface water
Bhutan	6	Rainwater Harvesting	895,000		Rain water
Burkina Faso	6	Control of sand encroachment/mud silting in the river basins of Mouhoun, Nakanbé and Comoé.	352,000		River basin
Burkina Faso	11	Implementation of safety zones and backup devices to control pollution of underground and surface water catchment infrastructures (lakes, wells, boreholes) in the cotton belts of Burkina (Mouhoun, South-West, Comoé and the Eastern part of Nakanbé).	330,000		Control of water pollution
Burundi	4	Rainwater Valorisation	1,000,000		Rain water
Burundi	10	Stabilisation of river dynamics of watercourses and torrents in Mumirwa, including the city of Bujumbura	2,000,000		River dynamics
Cambodia	1	Community and Household Water Supply in Coastal Provinces	1,000,000		Water supply
Cambodia	3	Safer Water Supply for Rural Communities	5,000,000		Water Supply
Cambodia	4	Development and Improvement of Community Irrigation Systems	45,000,000		Irrigation
Cape Verde	1	Mobilization and integrated water resource management project	13,680,000		Water resources
Central African Republic	7	Improvement of the drinking water system in the area of Imohoro	250,000		Water supply
Chad	1	Retention of surface water for agriculture and feeding of livestock	1,800,000		Water resources
Comoros	2	Increase in water supply	95,000		Water supply
Comoros	3	Improvement of water quality	80,000		Water quality
Djibouti	3	Implementation of restoration and management actions adapted to surface water	1,447,000		Surface Water

Eritrea	4	Groundwater recharge for irrigation wells	7,252,000		Groundwater
Ethiopia	3	Development of small scale irrigation and water harvesting schemes in arid, semi-arid, and dry subhumid areas of Ethiopia	30,000,000		Irrigation
Gambia	2	Improvement of Fresh Water Availability	910,000		Fresh water
Guinea Bissau	2	Improvement of Water Supply in Rural Zones	1,000,000		Water supply
Guinea Bissau	7	Promotion of Small-scale Irrigation in Geba and Corubal rivers Project	800,000		Irrigation
Haiti	13	Construction of reservoirs at household and community levels in Grand-Anse Province	828,955		Reservoir
Haïti	14	Rehabilitation of twenty five (25) water supply infrastructures in four (4) Farwest Districts	220,932		Water supply
Kiribati	1	Water Resource Adaptation Project		3,168,405	Water adaptation
Kiribati	1	Simple well improvement		336,470	Wells
Lao PDR	6	Mapping of flood prone areas	650,000		Water management
Lao PDR	9	Survey underground water sources in drought prone areas	2,100,000		Water management
Lao PDR	10	Study, design and build multi-use reservoirs in drought prone areas	2,350,000		Water resources
Lao PDR	11	Improve systems for the sustainable use of drinking water and sanitation with community	440,000		Water management

Examples of finance: Adaptation Fund



Board meet
documents

Fifth meetin
the Board

Green Climate Fund

GCF/B.05/02
Page 6

Annex II: Initial result areas of the Fund

- (a) Energy efficiency of buildings and appliances;
- (b) Energy efficiency of industrial processes;
- (c) Low-emission transport;
- (d) Low-emission energy access;
- (e) Large-scale low-emission power generation;
- (f) Agriculture and related land use management;
- (g) REDD+ implementation;
- (h) Sustainable forest management to support mitigation and adaptation;
- (i) Design and planning of cities to support mitigation and adaptation;
- (j) Support for result areas relating to all climate hazards;
- (k) Support for selected themes cutting across adaptation result areas (“flagships”);
- (l) Facilitating capacity for programmatic and transformative adaptation activities;
- (m) Facilitating scaling up of effective community-based adaptation (CBA) actions;
- (n) Supporting coordination of public goods such as “knowledge hubs”.

Example of info sharing: Nairobi Work Programme Database on Local Coping Strategies

The screenshot shows a web browser window with the URL <http://maindb.unfccc.int/public/adaptation/>. The page title is "Database on Local Coping Strategies". The left sidebar contains navigation links under "NEGOTIATIONS", "FOCUS", and "PROCESS". The main content area includes a description of the database, search instructions, a search form with dropdown menus for Hazard, Impact, Strategy, and Region, and a "Search" button. Below the search form is a table with five columns: Hazard, Impact, Strategy, Region, and Case studies. The right sidebar features "Related Databases" and "Related Web Portals" sections.

NEGOTIATIONS

- Meetings
- Documents & Decisions
- Bodies

FOCUS

- Adaptation
- Finance
- Mitigation
- Technology

PROCESS

- Essential Background
- Kyoto Protocol
- Cooperation & Support
- Adaptation
 - Cancun Adaptation Framework
 - Nairobi Work Programme Implementing Adaptation
 - National Adaptation Programmes of Action
 - [Local Coping Strategies Database](#)
- National Reports
- GHG Data

Database on Local Coping Strategies

This database is intended to facilitate the transfer of long-standing coping strategies/mechanisms, knowledge and experience from communities that have had to adapt to specific hazards or climatic conditions to communities that may just be starting to experience such conditions, as a result of climate change.

The database can be searched by climate hazard, impact or coping strategy, or a combination thereof, by selecting from the scroll-down menus. Please note that not all combinations of hazard/impact/strategy will lead to identification of a specific adaptation action. Following the submission of a query, you will be presented with a list of corresponding adaptation actions and associated case studies. Additional information on the case studies will also be provided, and include a short summary on the coping practice, details on resource requirements, non-climate benefits and potential maladaptation, as well as contact information and links to relevant files and web sites.

If you would like to contribute a case study documenting a successful local coping strategy, please send it to adaptation@unfccc.int

Hazard

Impact

Strategy

Region

Hazard	Impact	Strategy	Region	Case studies
Floods	Soil erosion	Soil conservation; Natural resource management	Latin America	Community Reforestation in Rio de Janeiro, Brazil Preventing soil erosion and landslides
Extreme heat	Urban heat islands	Natural resource management	North America and Europe	Creating Cool Communities (C3 Ontario): Urban reforestation in Toronto, Canada Creating a healthier micro-climate

Related Databases

- [TECA](#) (Technology for Agriculture) is a FAO initiative aimed at improving access to information and knowledge about available proven technologies for small holders in order to enhance their adoption in agriculture, livestock, fisheries and forestry
[Access to database](#)
- [WOCAT](#) (World Overview of Conservation Approaches and Technologies) seeks to support innovation and decision-making processes in sustainable land management, particularly in connection with soil and water conservation through knowledge sharing
[Access to technologies and approaches](#)
- [World Bank Indigenous knowledge practices database](#)

Related Web Portals

- [ELDIS: Community-based adaptation exchange](#), online portal to community-based adaptation featuring case studies, tools and additional background documents.

NWP: Database on Private Sector Initiatives

tp://unfccc.int/adaptation/nairobi_work_programme/private_sector_initiative/items

Local Coping Strategies Datab... Climate Change - Adaptati...

Search Share More >>

Knowledge Resources and Publications

Implementing Adaptation

National Adaptation Programmes of Action

Local Coping Strategies Database

National Reports

GHG Data

Methods & Science

Parties & Observers

Press

Secretariat

KEY DOCUMENTS

The Convention

Kyoto Protocol






Bali Road Map

Cancun Agreements

Issues Quickfinder:

Please choose

Type a search term:

Database of case studies				
Title of business case	Name of company	Business sector	Main adaptation area relevant to case study	Countries relevant to case study
 Enabling access to weather and climate services in Africa (147 kB)	Ericsson	Telecommunications	Science, assessment, monitoring and early warning	Uganda
 Providing farming training and assistance (218 kB)	Nestlé	Food and Beverages	Education and training; Food security, agriculture, forestry and fisheries; Water resources	China; Côte d'Ivoire; Ecuador; France; Indonesia; Mexico; Philippines; Thailand
 Mainstreaming adaptation into projects: the Climate Safeguards System prototype (111 kB)	Global Climate Adaptation Partnership (GCAP)	Consulting and Environmental Services	Science, assessment, monitoring and early warning	Tunisia
 Rainwater harvesting and storage technology (bob) (134 kB)	EnterpriseWorks/VITA (EWV) a Division of Relief International	Consulting and Environmental Services	Business; Human health; Water resources	Uganda
 The SimCLIM				

In sum...

- UNFCCC has much process, less sectoral technical work
- No specific work programme on water and climate change
- Groundwater impacts addressed primarily in country reports, funding proposals, Technical Papers requested by the Parties as a whole
- IPCC AR 5 WGII on Impacts Adaptation and Vulnerability due out March 2014, may trigger more discussion
- International Year of Small Island Developing States (2014) and Third Conference on Small Island Developing States (2014) may help generate information; clear water shortages, challenges with fresh water lenses in many atoll states

