



UNITED NATIONS
UNIVERSITY

UNU-INWEH

Institute for Water,
Environment and Health

The background of the cover is a composite image. The top half shows a close-up of vibrant green reeds or grasses. The bottom half shows a close-up of parched, cracked earth in shades of brown and tan. The text 'ANNUAL REPORT 2012' is centered over the transition between these two images.

ANNUAL REPORT 2012

The global water crisis has many facets, each of which grows more serious every year, making it a challenge to meet the Millenium Development Goal (MDG) targets on time. The coastal oceans in particular suffer via climate change and local degradation. Freshwater ecosystems are impacted by an altered hydrographic cycle and the growing extractions for agriculture, industry, and human use, while dryland regions face growing water challenges as impending water scarcity looms. In many regions, the provisioning of potable water and adequate sanitation are undiminished challenges. The perilous state of the oceans, which still provide some 16% of animal protein food for people, is now recognized by the Intergovernmental Panel on Climate Change (IPCC) and the World Economic Forum. A holistic ecosystem approach, encompassing physical, economic, socio-political, and cultural factors is required if we are to address the water crisis effectively.

Photo Credits

All photos within this report were contributed by UNU staff, unless otherwise indicated. Front cover images provided by Zafar Adeel and Petr Kratochvil (publicdomainpictures.net)

Table of Contents

UNU-INWEH at a Glance	4	Dryland Ecosystems	27 - 33
UNU-INWEH Programmes	5	Policy Support to UNCCD	
Director's Summary	6 - 7	Safe and Productive Use of Wastewater in Agriculture	
New and Emerging Initiatives	8 - 12	ELD Project Highlights	
Programme Progress Reports		SUMMAD Project Highlights	
Coastal Ecosystems	13 - 22	Optimization & Enhancement of Groundwater Recharge in UAE	
Strengthening Marine Protected Areas in Jamaica		Global HIMA Initiative	
Assessing Effectiveness of Marine Protected Areas in the Arabian Gulf		<i>Stories from the Field: Masters of Science in Drylands Management</i>	
Managing Tropical Coastal Seas in the 21 st Century		Water-Health Nexus	34 - 39
Managing Coasts in a Changing World Seminar Series		Hydrosanitas	
Caribbean Coastal Pollution Project (CCPP) Focus on Mangroves		Knowledge, Attitudes, Practices, Empowerment (KAPE)	
<i>Stories from the Field: The Future Outlook of Desalination in the Persian Gulf, Reef Reminiscences, World Oceans Day at Nelles Elementary School</i>		WADI (Water Associated Disease Index)	
Freshwater Ecosystems	23 - 25	<i>Stories from the Field: Women and Water: Dignity, Innovation and Leadership, Water Without Borders</i>	
KIM-UNU		Publications 2012	40 - 41
K* (K Star) Initiative		Our Partnerships	42 - 44
Water Learning Centre (WLC)		Our Donors	45
Report: GEF IW:Science		The UNU-INWEH Team	46
		The International Advisory Committee	47

To learn more about these initiatives, visit us at:
www.inweh.unu.edu

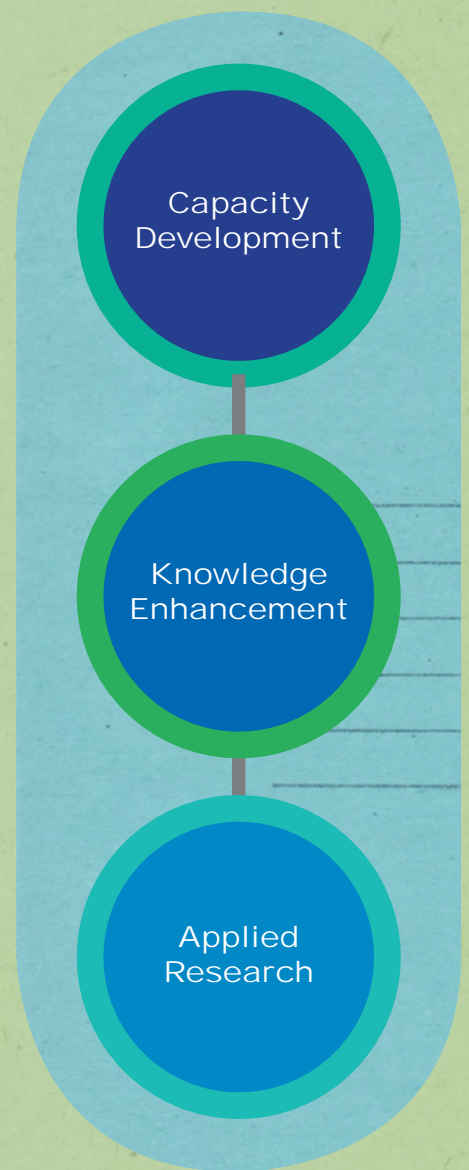


UNU-INWEH at a Glance

UNU-INWEH is the 'United Nations Think-Tank on Water'. Established in 1996, it responds directly to the global water crisis and facilitates the global efforts to meet the Millennium Development Goals. In so doing, it aligns with the overall vision for UNU. UNU-INWEH's three core functions are derived from its mandate:

- (a) Helping developing countries meet the MDGs through capacity development;
- (b) Facilitating global knowledge enhancement and networking to address the global water crisis;
- (c) Fostering better approaches to water management and governance through applied research designed to bridge critical policy gaps.

UNU-INWEH's implementation team is grouped according to the four thematic sub-programmes. Each thematic group is coordinated by a chief scientist (Assistant Director). These functional groups are supported by an office support team comprising of office administration, financial management, and media interaction with further support on implementation in the Middle East and North Africa region through a regional office. The support team is further underpinned by the Finance and Administration and the Human Resources units at UNU Centre.



UNU-INWEH Programmes

UNU-INWEH's implementation team is grouped according to four thematic programmes. Each group is headed by a chief scientist (Assistant Director), responsible for managing the project activities within the theme, operationalizing strategies for growth, scouting for new partnerships and initiatives, and overseeing staff members. Each programme follows the three core functions:

Coastal Ecosystems

We focus on improving scientific understanding through research and capacity development in an attempt to foster sound decision-making for management of our coasts. Our activities focus on a range of issues in tropical coastal systems, particularly in developing countries, while maintaining an integrated and holistic approach towards coastal management.

Freshwater Ecosystems

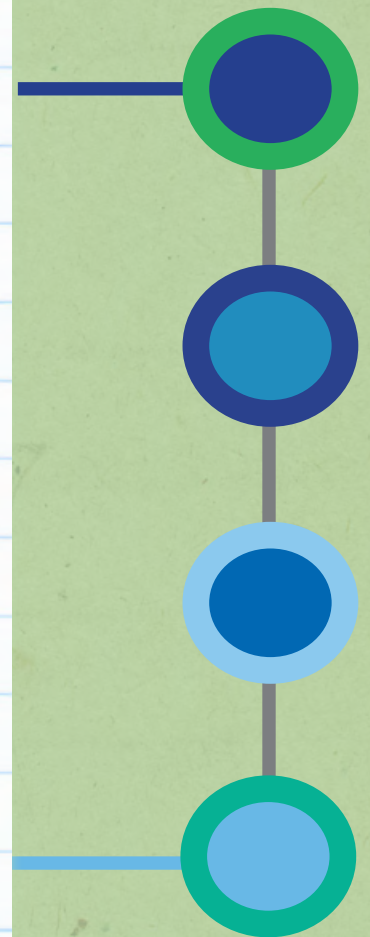
We contribute to improved and integrated water management. Particular emphasis is on data-information knowledge systems and their use for policy support. Building on past experience, capacity building focuses on distance learning programmes and tools in integrated water resources management directed at decision-makers and practitioners.

Dryland Ecosystems

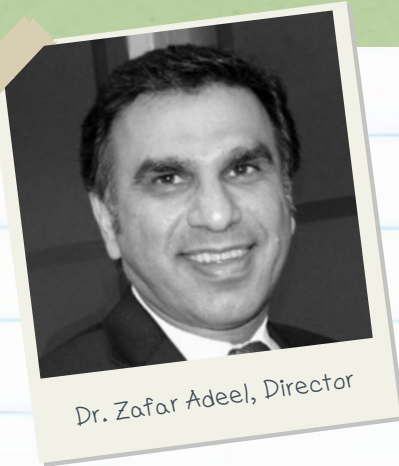
We assist developing countries in drylands to manage their water, land and biodiversity resources sustainably. We also help to synthesize the global knowledge on sustainable land management, particularly focusing on policy guidance to local and national decision-makers and the UN system. Capacity building is closely interlinked with research activities on alternative, community-based livelihoods in drylands.

Water-Health Nexus

We address the need for safe water provisioning to ensure both individual and community health and well-being. This programme facilitates the development of effective governance frameworks, provides leadership in developing a global network of expertise, and develops community-level approaches for engagement, ownership and empowerment.



Director's Summary for 2012



Dr. Zafar Adeel, Director



**UNITED NATIONS
UNIVERSITY**

UNU-INWEH

The year was a particularly successful one for UNU-INWEH, in which a number of strategic milestones were achieved. Three are particularly worth mentioning.

First, another long-term funding agreement with the Canadian Government was signed. This was based, in part, on a successful institutional evaluation jointly undertaken by UNU and the Canadian International Development Agency (CIDA). By all counts, this arrangement was a significant achievement, but even more so considering the present fiscal and economic environment in Canada.

Second, a six-year formal agreement was signed with McMaster University. This agreement afforded a formal recognition of the ongoing collaboration between UNU-INWEH and McMaster University for a decade and a half. Most notable amongst these is the joint graduate programme Water Without Borders (WWB) – a programme that has operated successfully since 2010 and has brought 23 outstanding graduate students to UNU-INWEH as three distinct cohorts. In 2012, McMaster University, in

close collaboration with UNU-INWEH, secured a C\$ 1 million grant from the Philomathia Foundation for the WWB programme. The formal agreement also noted the C\$ 360,000 contribution McMaster University will make towards the hosting of the UNU-INWEH offices at McMaster Innovation Park.

Third, significant progress was made in the dialogue with Alexandria University towards setting up a joint research facility. After three years of dialogue, the Alexandria University received permission from the Egyptian Ministry of Higher Education to organize a scoping workshop for the joint research facility, which was then held in May 2012. The senior management at Alexandria University, including President Prof. Osama Ibrahim, once again assured us of their full support for this venture. The security situation in Egypt remained unclear during 2012 due to ongoing political disturbance and upheaval. Some predict that the situation will calm down and revert to normalcy in the coming months.

Several new projects and initiatives took off with great fanfare in 2012. The first amongst these was an international conference (25-27 April 2012, Hamilton, Canada) on the knowledge domain, termed as KStar. It brought together a diverse group of international knowledge brokers from medicine, education, international development, and environmental sustainability domains. The outputs from the conference are already being widely used by a broad range of stakeholders. The second was the formal launch of the HIMA initiative during the West Asia and North Africa (WANA) Forum (29-30 May 2012, Amman, Jordan), under the patronage of H.R.H. Prince El Hassan Bin Talal. A third initiative brought focus to the safe use of wastewater which converged two parallel initiatives – one involving UNU-INWEH in a partnership with ICARDA and IWMI and the other involving UNU-INWEH, FAO, UNEP, WHO, and UNW-DPC. The former was created as a research alliance while the latter is a partnership to organize regional capacity development workshops on safe use of wastewater.

2012 was also a particularly successful year in terms of publications. Several policy briefs were launched during the year, in addition to landmark peer-review publications. The former included: *Science-Policy Bridges Over Troubled Waters*; *Expanding Our Understanding of K**; *Securing the Future of Mangroves*; and *Reef Reminiscences*. The book *The Global Water Crisis: Addressing an Urgent Security Issue* was launched in a prominent public event in which the keynote speaker was the former Canadian

Prime Minister, The Rt. Hon. Mr. Jean Chrétien. Minister Maria Mutagamba of Uganda visited UNU-INWEH for three days in September 2012 and took part in three very well-attended events.

In summary, 2012 demonstrated the full weight of the intellectual excellence of the UNU-INWEH team. At the same time, the extensive “social capital” that UNU-INWEH has built over the years was also observable in spades. The entire team deserves to be applauded for a spectacular year.



**Dr. Zafar Adeel, Director
United Nations University
Institute of Water, Environment and Health**

New and Emerging *Initiatives*



The Rt. Hon. Mr. Jean Chrétien



Book Launch Audience at UNU-INWEH



Director Zafar Adeel provides opening statement to panel discussion



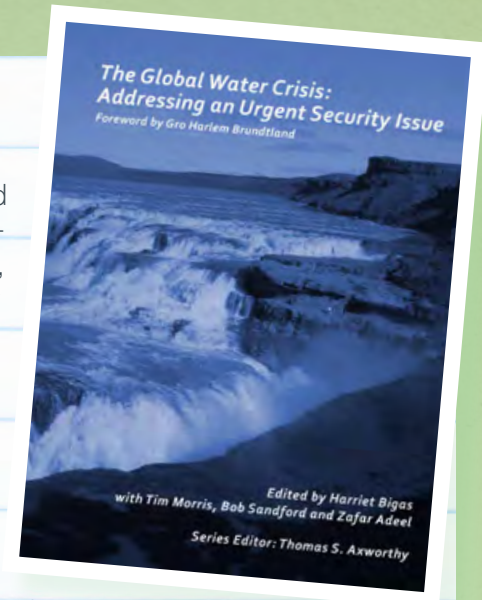
Mr. Chrétien with Peter George and panellists

Water Security

Water security has emerged as a complex and interconnected challenge, highlighting water's centrality to achieving increased levels of development, sustainability, and human well-being. Water security is increasingly gaining traction in the global political agenda and earning attention from national governments at the highest level due to its links to peace and national security: water is increasingly being recognized as the key link to securing a peaceful future through cooperation, innovation, and opportunities to ensure equity, promote development, and support growth — so long as it is used, managed, governed and shared wisely.

In 2012, UNU-INWEH published the book *The Global Water Crisis: Addressing an Urgent Security Issue*, together with the Walter & Duncan Gordon Foundation and the InterAction Council, the latter a group of former heads of state and government. This book brought together contributions from leading experts from around the globe on the implications of water on political and global security, development, and the role of international law in ensuring water security for all. The book was formally launched in September 2012 with a keynote address by InterAction Council Co-Chair and Former Prime Minister of Canada, The Rt. Hon. Mr. Jean Chrétien

The topic of water security was further highlighted during the High-Level Roundtable Discussion on “Water, Peace and Security” at the 67th Session of the United Nations General Assembly in September 2012 attended by the UNU Rector Konrad Osterwalder, U.S. Secretary of State Hillary Clinton, the EU High Representative for Foreign Affairs and Security Policy Lady Catherine Ashton, and the UN-Water Chair Michel Jarraud.



Panellists (from L to R): Bill Cosgrove, Harriet Bigas, Bruce Parly



20 Niles Needed to Feed Growing Population

The world needs to find the equivalent of the flow of 20 Nile rivers by 2025 to grow enough food to feed a rising population and help avoid conflicts over water scarcity, a group of former leaders said on Monday.

- TIME

Former World Leaders, Including Chrétien, Sound Alarm on Global Water Crisis

But former Canadian prime minister Jean Chretien, who co-chairs the council, says the group is trying to raise awareness of the urgency of the crisis in hopes that the Security Council will recognize water as a top security concern facing the planet.

- CANADIAN PRESS

World Water Crisis Must be Top UN Priority

A rapidly worsening water shortage threatens to destabilize the planet and should be a top priority for the UN Security Council and world leaders, a panel of experts said in a report.

- AGENCE FRANCE-PRESSE



Secretary Hillary Clinton at the roundtable talk on "Water, Peace and Security"

Download your free copy of *The Global Water Crisis: Addressing an Urgent Security Issue* at:

<http://www.inweh.unu.edu/publications.htm>



New and Emerging Initiatives

Food Security

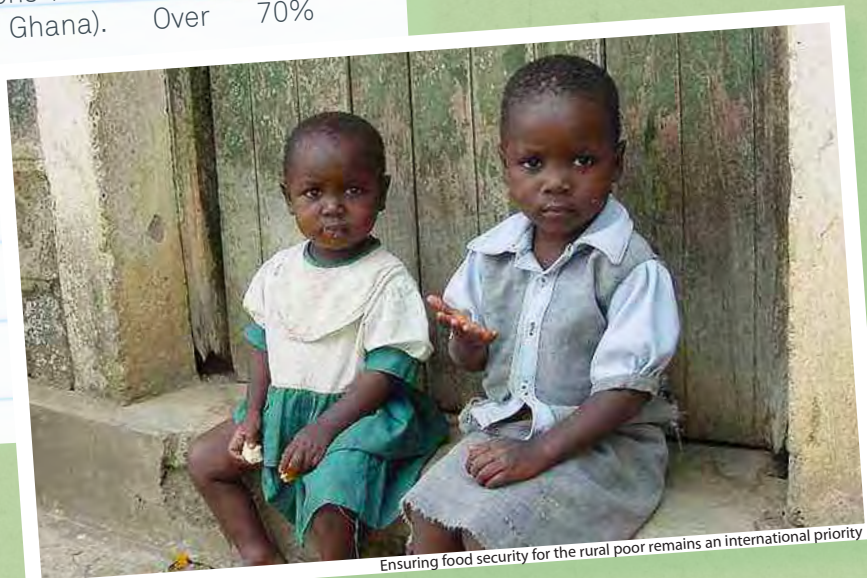
Global food security has re-emerged as a critical challenge that links national security and environmental sustainability concerns. The global food market is a significant indicator of these concerns. Since 2008, food prices have skyrocketed and become extremely volatile, resulting in a significant rise in malnutrition, poverty and political volatility.

International initiatives on food security pay due attention to food production and increased nutrition. However, one neglected driving force of the food security debate is water scarcity and drought. As much as 60% of the global population is likely to suffer water scarcity by 2025 and early indications of these adverse trends can be observed today. *This suggests that it is this scarcity of water that will be the single greatest constraint in securing the food supply of hundreds of millions of people worldwide.*

Consequently, UNU-INWEH has developed an initiative to improve food security through raising awareness of water limitations at the policy level and demonstrating improved water management technologies, as well as institutional and economic options in two sub-Saharan countries (Burkina Faso and Ghana). Over 70% of household income of the poor is spent on food in these countries. UNU-INWEH has joined hands in this endeavor with the University of Guelph, Canada, the International Water Management Institute, UNU-INRA, and a number of local partners.



Source: FAO



Ensuring food security for the rural poor remains an international priority



Photo credit: George Hodan



Photo credit: Florian Pircher

Sustainable Development Goals and the Post-2015 Development Agenda

As we approach 2015, the tenure for the Millennium Development Goals will conclude and the international community of governments, development/aid organizations, and the UN system are working to devise a new development paradigm. The global leaders who convened at the Rio+20 Summit (July 2012) agreed to formulate a new set of “Sustainable Development Goals” (SDGs). Water is anticipated to be a central element of this new development paradigm. To complement these efforts, the United Nations Office for Sustainable Development (UNOSD) and the United Nations University Institute for Water, Environment and Health (UNU-INWEH) are jointly conducting an analytical study to advance the development and implementation of water-related SDGs. The findings of this study, developed in collaboration with the Stockholm Environment Institute (SEI), will directly inform the planning exercise being undertaken by the UN member states as well as the UN system. It will also serve to support the team at UN-Water, which is working on developing specific goals and targets for an SDG pertaining to water. The results of these analyses will be presented at the 68th session of the UN General Assembly in late 2013.



Partnership with Alexandria University

In order to further strengthen UNU-INWEH's presence in developing and transitional countries and to intensify research and teaching interactions, we are working on establishing a Joint Research Facility at Alexandria University, Egypt. It builds on some of our existing collaborations, such as the project Sustainable Management of Marginal Drylands (SUMAMAD) and the Joint Master's Programme on Integrated Drylands Management. A first planning workshop was co-organized at Alexandria University in May 2012 with the aim of designing a research road map for the Joint Research Facility. The workshop was successful in developing a common understanding and vision of joint activities, together with an agreed thematic and geographic focus for these activities.



Workshop participants in Alexandria

Progress Report: Coastal Activities & Projects



The project aims to increase the resilience of coastal areas in Jamaica by strengthening current management of marine protected areas

Strengthening Marine Protected Areas in Jamaica

In November 2012, the UNU-INWEH Coastal Programme began a project under contract with the National Environment & Planning Agency (NEPA) in Jamaica to enhance and develop business management plans for three Marine Protected Areas (MPAs) in Jamaica (Negril, Portland Bight, and Montego Bay). This project, funded by the European Union (EU), is part of a larger project on Climate Change Adaptation and Disaster Risk Reduction. The island of Jamaica is highly vulnerable to climate change impacts, and faces direct threats from climate change because of its geographic location. This project is expected to improve the country's climate change adaptation efforts and increase resilience to impacts from climate change by improving the management and protection of healthy coastal ecosystems and restoration of degraded coastal areas. It involves extensive literature reviews, on-site community/stakeholder consultations, economic/financial valuation, and analyses and business management planning for each of the three selected MPAs.

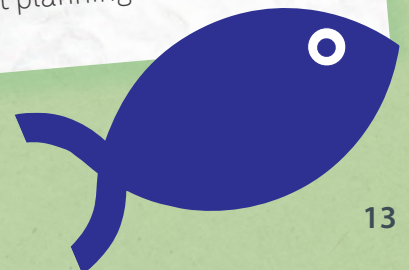


Photo credit: Edwin Grandcourt



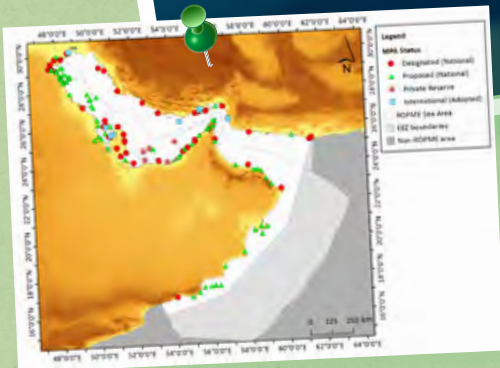
Main fish landing site in Abu Dhabi, UAE

Photo credit: Georgenes Cavalcante



Assessing Effectiveness of Marine Protected Areas in the Arabian Gulf

Marine Protected Areas (MPAs) can play a critical role in protecting marine biodiversity, ecosystem functioning, and sustaining healthy coastal communities. However, MPAs globally face challenges in achieving their objectives: e.g. insufficient financial and technical resources, lack of trained staff, or lack of data for management decisions. The management of MPAs must be effective to address these challenges and realize the benefits MPAs can provide. “Management effectiveness” is the degree to which a protected area achieves its goals and objectives. During 2012, UNU-INWEH and the Senckenberg Institute conducted the first-ever regional assessment of the status and management effectiveness of MPAs in the ROPME Sea Area (RSA). It found a total of 173 MPAs covering 7.8% of the RSA (36,182.03 km²) of which only 37% are legally “Designated” (5.4% RSA), while 73% remain “Proposed” (2.4% RSA). The assessment revealed variable levels of effectiveness performance ranging from 11% to 58%, with an average of 34%. The results also revealed the common challenges and constraints to the effective management of the MPAs within the RSA and the paper discusses the underlying causes for low performance. Findings were published in the Marine Pollution Bulletin: *Van Lavieren, H., Klaus, R. An effective regional Marine Protected Area network for the ROPME Sea Area: Unrealistic vision or realistic possibility? Mar. Pollut. Bull. (2012)*. A proposal was developed in partnership with ROPME, UNEP, and UNESCO to continue this survey for the Gulf region and include the Red Sea and Gulf of Aden MPAs as well. This proposal is currently being considered for funding.



Managing Tropical Coastal Seas in the 21st Century

Tropical coastal regions lie exclusively in developing countries and major portions of their populations depend heavily on coastal waters for protein food, as well as relying on coastal ecosystems for other necessities, livelihoods, and protection from storms. While there are geographic differences in population density, level of development, and state of the marine environment, tropical coastal seas are generally in decline, overfished, and polluted. Climate change, ocean acidification, and the growth of coastal populations together amplify the stresses on these coastal ecosystems. The goal for this project is to develop some innovative solutions on how to strengthen the management of coastal marine systems to cope with the changes that are coming. In July 2012, a group of 24 world-class specialists gathered in Brisbane, Australia to share on-the-ground experience in building capacity for management of coastal fisheries, aquaculture, or water quality in tropical coastal regions. The experts are physical, biological, and social scientists, and most have spent long careers in their respective fields. In collaboration with the University of Queensland, we hosted this initial workshop in which a range of ideas were explored and served as the basis for continuing work. The participants are continuing the interaction via e-mail and Skype while preparing several manuscripts for publication in the technical literature.



Photo credit: Yvonne Sadovy
Fishing at sunrise



Photo credit: Yvonne Sadovy



Fishing boats in Kingston harbour, Jamaica
Photo credit: Ken Drouillard

Learning from Coastal Efforts

Managing Coasts in a Changing World - Seminar Series

Coastal ecosystems are severely stressed in many parts of the world as a result of overpopulation, intense coastal development, urbanization, spiraling resource use, pollution, and spread of invasive species. Climate change is expected to exacerbate these stressors and is considered by many to be one of the most important challenges facing the world in the 21st century. This seminar series invites experts to present topics relating to coastal environmental science and management in the face of climate change.

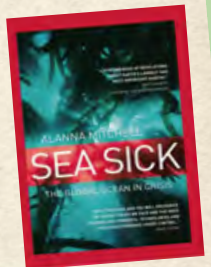


Managing Coasts in a Changing World 2012 Seminars



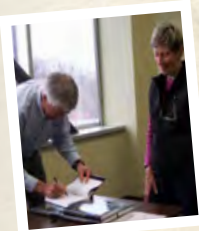
Alanna Mitchell, *The Global Ocean in Crisis*

Award-winning Canadian journalist and author, Alanna Mitchell, talked about her book *Sea Sick*, the first book to examine the current state of the world's oceans and the great unexamined ecological crisis of the planet: the fact that we are altering everything about the oceans, from their temperature, salinity, and acidity, to the life within them. She shared her stories about joining crews of leading scientists in nine of the global ocean's hotspots to see firsthand what is really happening to the world's oceans. She spoke about the impact of coral reef bleaching, the puzzle of the oxygenless dead zones such as that in the Gulf of Mexico, and the devastating implications of the changing pH balance of the sea.



Dr. Peter F. Sale, *A Global Environmental Crisis: The Fate of Coral Reefs and our Oceans*

Dr. Peter F. Sale talked about how coral reefs as we know them could disappear from the Earth by 2050, all because of things we did to them. As a coral reef ecologist, Peter Sale has a particular perspective on the environmental crisis, and he used his experience in this seminar to illustrate how the future for coral reefs depends intrinsically on decisions we make about other things. He reviewed the range of our impacts on reefs, their consequences, and likely trends in each.



Dr. Sale autographing his book

Dr. Pat Chow Fraser, *Using Science to Inform Policy in Coastal Wetland Protection: Is that Enough?*

Coastal wetlands are among the most productive ecosystems in the world, comparable to tropical rain forests and coral reefs. However, 35% of the original wetlands along the Canadian shores of Lakes Erie, Ontario and St. Clair have already been lost, with losses from 73–100% between Toronto and Niagara Falls. Most has been due to dredging, draining, and conversion to cities and farmland. This seminar considered the following question: There has been sufficient science to inform policy, but are people sufficiently informed of the policy?



Dr. Pat Chow Fraser



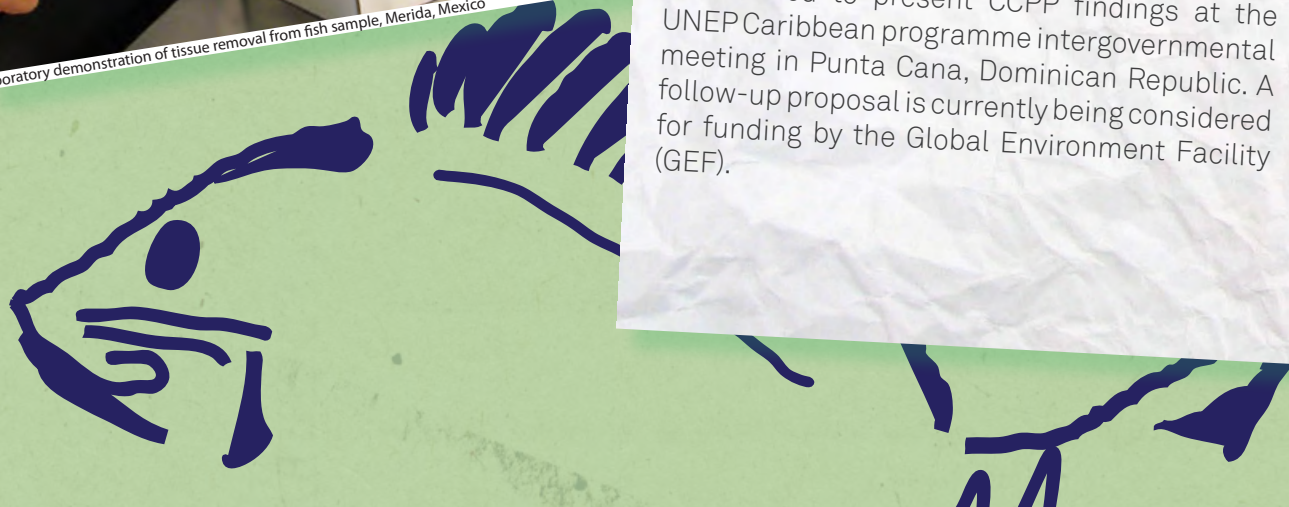
One aim of the CCPP is the management of Persistent Toxic Substances



Laboratory demonstration of tissue removal from fish sample, Merida, Mexico

Caribbean Coastal Pollution Project (CCPP)

The CCPP (2007–2010) was funded by Canada's Persistent Organic Pollutants (POPs) Trust Fund through the World Bank. Several activities are still ongoing and key outputs are being completed. This project aims at the assessment, monitoring, and management of POPs in coastal ecosystems of eight countries in the Caribbean region: Belize, Guatemala, Honduras, México, Dominican Republic, Jamaica, St. Lucia, and Trinidad & Tobago. This project involved a series of training workshops, upgrading of laboratory technical capacity, two research projects, and a monitoring program for POPs in coastal fish. Analysis for POPs in fish samples from four countries for two years were analyzed by the University of West Indies (UWI) laboratory in Jamaica and entered into a database. During 2012, a PhD student from UWI Jamaica focused her research on bio-monitoring of POPs in oysters and fish under the CCPP framework, with supervision from a professor at the University of Windsor. Also, in November 2012 UNU-INWEH was invited to present CCPP findings at the UNEP Caribbean programme intergovernmental meeting in Punta Cana, Dominican Republic. A follow-up proposal is currently being considered for funding by the Global Environment Facility (GEF).



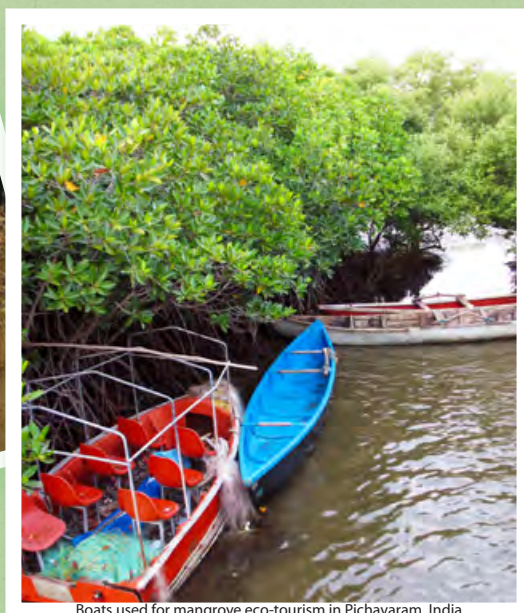
International Course: Biodiversity of Mangrove Ecosystems

UNU-INWEH has been supporting this annual training course since 2000 in collaboration with UNESCO-MAB. Its objective is to build the capacity of professionals and institutions in developing countries to undertake monitoring, research, and conservation of critical coastal ecosystems within mangrove forests. Most recently completed, the 12th annual training course took place from November 27–December 11, 2012 at Annamalai University in India. Eleven participants from six countries in South East Asia attended. Efforts to expand this course to the East and West African regions and the Caribbean are at advanced stages and discussions with potential partners are ongoing.



Students planting young mangrove plants, India

Photo credit: K. Katherisan



Boats used for mangrove eco-tourism in Pichavaram, India



Students being instructed with sampling techniques, India

Photo credit: K. Katherisan

Mangrove Ecosystems Postgraduate Course

UNU-INWEH is in the process of transforming the “International Course: Biodiversity of Mangrove Ecosystems” into a postgraduate level online course. The online content will eventually be complemented by a short hands-on field and laboratory component. In partnership with the Latin America School for Protected Areas of the University of International Cooperation in Costa Rica, the course will be piloted in fall 2013 to become one of 14 courses taught via an online Master’s Program in Coastal and Ocean Management. In partnership with The Nature Conservancy (TNC), the courseware will also be launched in 2013 as distance education courses via the TNC online free access conservation training platform www.ConservationTraining.org. The courseware will also be offered through Annamalai University, India, and perhaps other regional partners.

Coastal Policy Report:

Securing the Future of Mangroves



In October 2012, the UNU-INWEH Coastal Programme launched a policy brief which was largely based on the *World Atlas of Mangroves* (2010), published by Earthscan as an output of a joint project which was primarily funded by the International Tropical Timber Organization (ITTO) through the Japanese Government, and implemented by the International Society for Mangrove Ecosystems (ISME) since 2005 in collaboration with UNU-INWEH, FAO, UNEP-World Conservation Monitoring Centre (WCMC), UNESCO-Man and the Biosphere programme (UNESCO-MAB), and The Nature Conservancy (TNC). The launch took place at the 2012 Conference of Parties (COP) of the UN Convention on Biological Diversity (UNCBD) in Hyderabad, India. The aim of the policy brief is to

provide managers with lessons learned on the conservation and management of mangroves, and recommend policy measures that could be taken in order to protect them. The production of this brief was funded by UNU-INWEH, UNESCO-MAB, and the Spanish Government. It was co-written by Hanneke Van Lavieren, Mark Spalding, Dan Alongi, Mami Kainuma, Miguel Clüsener-Godt, and Zafar Adeel. The policy brief received a high level of media coverage in approximately 170 news sites/wires/newspapers/organizations across 28 countries in four languages (Spanish, English, German, Italian).

To download your free copy of
Securing the Future of Mangroves:
<http://www.inweh.unu.edu/publications.htm>



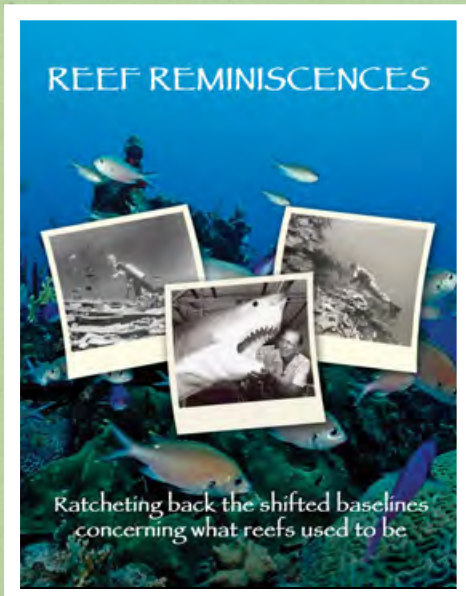
Mangroves under threat from shrimp farms: UN

Valuable mangrove forests that protect coastlines, sustain sealife and help slow climate change are being wrecked by the spread of shrimp and fish farms, a U.N.-backed study showed on Wednesday.

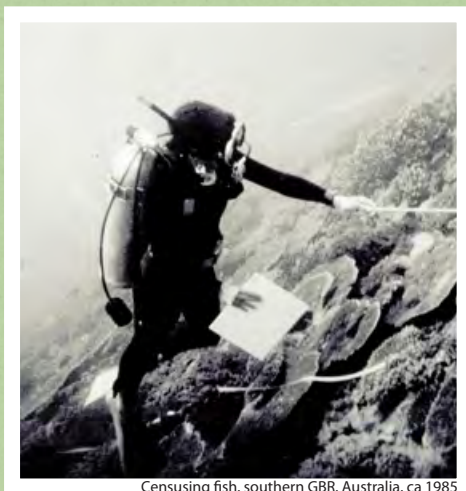
- REUTERS

Stories from the Field:

The Reef Reminiscences Project



It is estimated that reef and shore fish stocks in Hawai'i are now 1/4 of what they were 100 years ago.



Censusing fish, southern GBR, Australia, ca 1985

We often hear from our elders how the world has changed and degraded since their youth. This is specially true for coral reef ecosystems, which have suffered extensively from decades of overfishing, pollution, and poor coastal management. Reefs in some places are in better shape while in others they are virtually destroyed with little coral and collapsed fisheries. However, how much has changed? Our awareness is limited by the relatively short duration of individual experience and our tendency not to look back into the past when assessing evidence. In essence, each of us resets the baseline when thinking about environmental change, a term coined as “shifting baselines” by Daniel Pauly. The young scientists of today have not seen coral reefs in the pristine conditions of half a century ago. In an attempt to illustrate how they were, this brochure offers a collection of stories from 13 famous legends of the coral reef community, including Dr. Jack Randall who is responsible for describing 795 valid species of marine fishes and Dr. Charlie Veron who discovered and described 20% of all coral species in the world. Each of the authors tells their reminiscences of their “early days” as coral reef scientists when they had begun their careers in the 1950s, 60s and early 70s. The brochure was released during the International Coral Reef Symposium, in July 2012 in Cairns, Australia — a global quadrennial event bringing together several thousand reef scientists and managers. It was an opportunity for younger reef workers to learn about what we have already lost, in hope that this will inspire greater efforts to prevent further loss.

Download your free copy of *The Reef Reminiscences Project: Ratcheting Back the Shifted Baselines* at:

<http://www.inweh.unu.edu/publications.htm>



Stories from the Field: *The Future Outlook of Desalination in the Persian Gulf*



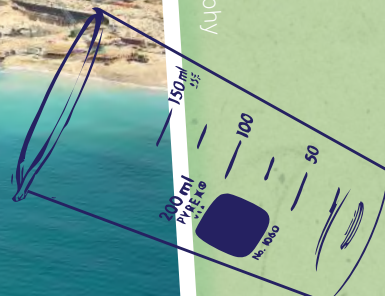
Photo credit: Omar Saif

Omar Saif



Photo credit: Airview Aerial Photography

Power and desalination plant in Jebel Ali, Dubai, UAE



In the spring of 2012, Omar Saif, a young UNU-INWEH Water Without Borders student, conducted a thesis research project called *The Future Outlook of Desalination in the Persian Gulf: Challenges, Opportunities and Lessons Learnt from Qatar & the UAE*. He travelled to Qatar and the United Arab Emirates (UAE) to learn more about their desalination and water/energy sectors with the aim of providing a future outlook and illustrating the major challenges and opportunities that exist. His work involved analyzing the current state of the water/energy sectors and assessing how desalination links the two sectors, and identifying current and planned government policies and how they impact sustainability. He aimed to provide recommendations on how desalination can be made more sustainable through policy change. Omar also attended two conferences where he was able to connect with key players. His final research report explains his findings as well as some key policy recommendations, which could vastly increase the sustainability of desalination in Qatar and the UAE along with their energy and water sectors.



Stories from the Field:

World Oceans Day at Nelles Elementary School



June 2012, World Oceans Day Art at Nelles Elementary



As part of raising the awareness amongst young children, UNU-INWEH organized a whole day event at a primary school in Grimsby, Ontario. Activities revolved around an oceans theme and included 1) all students wearing blue; 2) an art competition (on large canvass with water paints, free style) amongst the classes (grades 1-6) with an ocean-themed prize for the winning class; 3) a 20-minute short documentary on oceans and ocean-threats in the gym for all classes; 4) ocean-themed worksheets (geography, science, language, and math) that students were asked to complete; 5) teachers discussing key facts and threats to oceans, listing ten things students can do to help protect the oceans; and 6) ocean-themed food items provided by the school during the day.

Progress Report: Freshwater Activities & Projects



KIM-UNU

KIM-UNU, “Knowledge Integration and Management — United Nations University”, is a consolidated knowledge management system (KMS) that is used for assimilation, extraction, and transformation of knowledge from disparate sources into a single model that is more consistent and accurate. This model was developed by UNU-INWEH in partnership with the Centre for Community Mapping. In KIM-UNU, documents and information are stored in a relational database; the ability to quickly and effectively integrate this existing information via a search interface allows for efficiencies in targeting new initiatives and builds on the body of knowledge that exists. Built into this database, a suite of communication and interaction tools allow users to view, comment, and access information as a group in either real time or as a shared collaborative workspace.

The basic platform of KIM-UNU is now being used for the following purposes:

- “IW:Science” (KMS implementation for the use of science in the International Waters (IW) projects of the Global Environment Facility (GEF));
- The Lake Victoria Basin Commission (KMS implementation between Kenya, Uganda, Tanzania, Rwanda, and Burundi);
- “HydroSanitas” (KMS implementation for safe water provisioning around the world);
- “Knowledge from Land” (KMS implementation of institutions concerned with land degradation and sustainable land management);
- The Water Learning Centre (Distance learning for Integrated Water Resource Management).

K* (KStar)

K* (KStar) has been coined as the overarching concept, and as a useful shorthand for the terms that make up the knowledge sector, including knowledge management, knowledge brokering, knowledge translating, knowledge exchange, and knowledge mobilization. In April 2012, UNU-INWEH in partnership with a number of Canadian and international organizations, convened a conference in Hamilton, Canada, including 120 registered webcast participants throughout the world, that brought together people from different geographies and sectors who represented these different functions. The aim of the conference was to develop a mutual understanding about this emerging but fragmented field of knowledge sharing in the context of improving knowledge use in policy, industry, and practice. No common language exists for K* practitioners to talk to each other across their different functions, sectors, and geographies. The conference demonstrated that not only was this possible but it improved the sharing of experience and lessons. The conference resulted in the K* Concept Paper (setting out the core concept and framework for thinking about K* and providing case studies from a diverse range of organizations), a draft Green Paper, and a global network of K* practitioners, with the conference participants who will continue to share experiences and learn from each other.



K* Conference in action

K* is the collective term for the set of functions and processes at the various interfaces between knowledge, practice, and policy. K* improves the ways in which knowledge is shared and applied, improving processes already in place to bring about more effective and sustainable change.



K* Conference participants

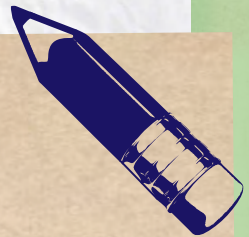


WLC - UN Water Learning Centre

The UN Water Learning Centre (WLC) was re-launched with the new title and logo. The distance learning software (StudySpace™) and the nine courses in the Integrated Water Resources Management (IWRM) programme have been upgraded and improved. A new, dedicated website (<http://wlc.unu.edu>) was launched that provides more details of the Regional Centres and courses. The Regional Centres at Bahrain (Arabian Gulf University), Panama (CATHALAC), Kenya (University of Nairobi), and Thailand (Asian Institute of Technology) continue to be active partners to the programme. Collectively they have graduated over 150 students with UNU Diplomas in IWRM since the inception of the WLC. IWRM continues to play an important role in mitigating the many water issues in the developing world and the education provided to practitioners and recent graduates by the WLC helps provide the trained personnel required to carry out complex IWRM plans. The WLC will be expanded with new course offerings in Water and Health issues, developed with the support of AGFUND, and, later, a course in Global Climate Change. These will be offered to the Regional Centres as separate programmes in the same manner as the IWRM programme.



POST CARD



"The whole experience was very interesting as well as feedback from peers and course instructors. I learned what Integrated Water Resources Management is about, how it is implemented and the difficulties and rewards of achieving IWRM. My work is directly related to IWRM. In Uruguay the "Water Plan" is being developed, so the application of the knowledge gained in the diploma is essential for my work. I found the teaching method very good and became familiar with the platform really fast. Overall everything seemed fine. I think it would be useful to emphasize in the virtual forums. Thank you very much for everything, it was a pleasure to have met and shared this nice experience!"

- Ximena Lacues-Uruguay. Graduate of the WLC programme at CATHALAC, Panama City, Panama

Freshwater Report:

GEF IW:Science



The Global Environment Facility (GEF) IW:Science project reviewed the science and learning opportunities from 20 years of transboundary water projects that make up the International Waters (IW) portfolio. The portfolio represents the largest investment of multi-national collaborations on shared water systems ever, consisting of a US\$ 1.2 billion GEF investment matched with US\$ 6.4 billion in co-financing and involving 150 countries. The project was designed to conduct a review, analysis and synthesis of the science used within these GEF projects. Five groups of scientists, comprising experts both within and external to the IW projects, were assembled according to the five GEF IW system types: River Basins, Lakes, Groundwater, Coastal Zone/Land-based Pollution Sources, and Large Marine Ecosystems and the Open Ocean. UNU-INWEH completed the major components of the IW:Science project in 2012, culminating with the final scientific synthesis product, the IW:Science Synthesis Report *Science-Policy Bridges Over Troubled Waters – Making Science Deliver Greater Impacts in Shared Water Systems*, which was launched at the GEF IW:Science Conference in September 2012.

The IW:Science project involved the creation of the IW:Science Knowledge Management System, a fully integrated relational database of IW documents and suite of learning network and communication tools. The software platform is now seeing its re-application as the “Knowledge Information and Management – United Nations University” (KIM-UNU) software platform for other projects. This powerful tool made the synopsis and analysis process of 5,500 documents possible while capturing new knowledge and review insights of the scientific working groups created for this project. The considerable database built for IW:Science, the largest ever for GEF IW projects, was shared with the UN-Water Activity Information System (UNW-AIS). This partnership serves to benefit the transboundary water interests of both GEF and UN-Water through information exchange and online integration of results.

Experts Warn of Global ‘Water Bankruptcy’

Experts have sounded warning bells on ‘water bankruptcy’ for many regions, after conducting a 20-year review of 200 major global projects.

- INDO-ASIAN NEWS SERVICE



Progress Report: Drylands Activities & Projects



Photo credit: UNCCD

Photo credit: Petr Kratochvíl

Policy Support to UNCCD

Gridlocking of progress on environmental problems in inter-governmental process such as the Inter-governmental Panel on Climate Change (IPCC) suggests that a more flexible approach is needed in order to provide scientific advice to UN conventions. UNU-INWEH is involved in the design of such a process for the United Nations Convention to Combat Desertification (UNCCD). The establishment of an international non-governmental scientific association is proposed that functions as a network of networks. A new smaller and nimble inter-sessional platform is proposed as the interface between scientists and policy-makers where summary reports can be scrutinized line-by-line. This platform would be linked to the UNCCD's Committee on Science and Technology who would formulate recommendations to the Conference of the Parties (COP).





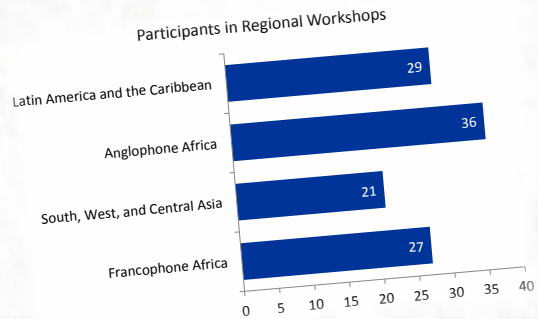
Safe and Productive Use of Wastewater in Agriculture

With projections indicating water-scarce countries will need to increasingly rely on alternate water resources, wastewater offers great promise to narrow the gap between water demand and supply for agriculture. However, skilled human resources, institutional capacity, implementation of research-based knowledge, and flexible policy frameworks are lacking in most developing countries to tackle the complex issues arising from wastewater use in agriculture.

An alliance of seven UN-Water members and partners (UNU-INWEH, FAO, WHO, UNW-DPC, UNEP, ICID, and IWMI) have initiated a capacity development project aiming at safe and productive use of wastewater in agriculture. With the inception workshop in November 2011, four regional capacity development workshops were organized in 2012, which were held in Morocco (18–19 February), India (16–18 May), South Africa (26–28 September) and Peru (11–13 December), bringing together representatives of 64 UN member states from these regions.

The priority topics addressed in these workshops were: 1) economic challenges of wastewater management; 2) policies and institutional arrangements and collaboration at different levels to promote safe and productive water reuse; 3) environmental effects of wastewater and monitoring and evaluation systems for water quality assessment; 4) social aspects and cultural acceptability for wastewater irrigation; and 5) health risk assessment and mitigation.

With one remaining regional workshop and a final wrap-up workshop, the first phase of the project will end in 2013. This joint initiative was formally recognized as a UN-Water project in 2012.



A collaboration of UN-Water Members, Partners and Programmes

A multi-year project

Safe Use of Wastewater in Agriculture

» Developing national capacities to promote safer practices

www.ais.unwater.org/wastewater

For more information, visit:

<http://www.ais.unwater.org>



ELD Project Highlights

Who knows the true value of land? With the increased demand for land, especially from foreign investors from emerging economies who are trying to fulfil their growing food, water, and energy needs, there is a need to level the playing field so that developing countries do not sell themselves and their land short.

UNU-INWEH has joined a global initiative on the Economics of Land Degradation (ELD) that aims to complete a global assessment of the economic benefits of sustainable land management (<http://eld-initiative.org>). The initiative calls for a global approach for the analysis of the economics of land degradation that fits with national environmental, political, economic, and institutional frameworks and conditions. It aims to mainstream the economics of land degradation into policies and decision-making by increasing public awareness of the value of land. This initiative will identify win-win scenarios for development and increased investment opportunities by providing alternative livelihoods that will contribute to better land management and human well-being. Reports will be targeted to the scientific community, public decision-makers at the national, regional, and local levels, as well as the private sector.

UNU-INWEH is responsible for the scientific coordination of the initiative that will use a total economic value approach to better value land. In 2012, UNU-INWEH organised two scientific meetings to discuss and establish an organisational structure for the initiative and its conceptual frameworks. This initiative has raised great interest and commitment from the academic community as well as public and private decision-makers. Case studies are being reviewed and plans are under way to establish new studies.



Land degradation on olive groves on the Syrian-Turkish border

Land degradation costs an estimated US\$40 billion annually worldwide, without taking into account the hidden costs of increased fertilizer use, loss of biodiversity, and loss of unique landscapes.





Integrating manure and water for food production at the SUMAMAD site in the Bolivian altiplano



Simple equipment designed locally for irrigating crops in the Bolivian altiplano.



The SUMAMAD workshop visits the Mare aux Hippopotames Biosphere Reserve in Burkina Faso



Field experiments with levels of fertilization in growing organic quinoa



SUMAMAD



SUMAMAD Project Highlights

Focusing on nine project sites (Bolivia, Burkina Faso, China, Egypt, India, Iran, Jordan, Pakistan, Tunisia) in different dryland regions across the globe, the Sustainable Management of Marginal Drylands (SUMAMAD) project aims to improve the livelihoods and well-being of dryland dwellers by fostering scientific drylands research with a view to informing policy at the local and national levels. Together with a network of local researchers and institutions in the nine country sites, the SUMAMAD project aims to 1) foster the rehabilitation of degraded drylands with sustainable management and conservation practices; 2) provide policy-relevant guidelines for decision-makers in drylands, with a specific focus on options for adapting to climate change impacts; 3) develop sustainable, alternative livelihoods to diversify income opportunities and improve overall levels of well-being.

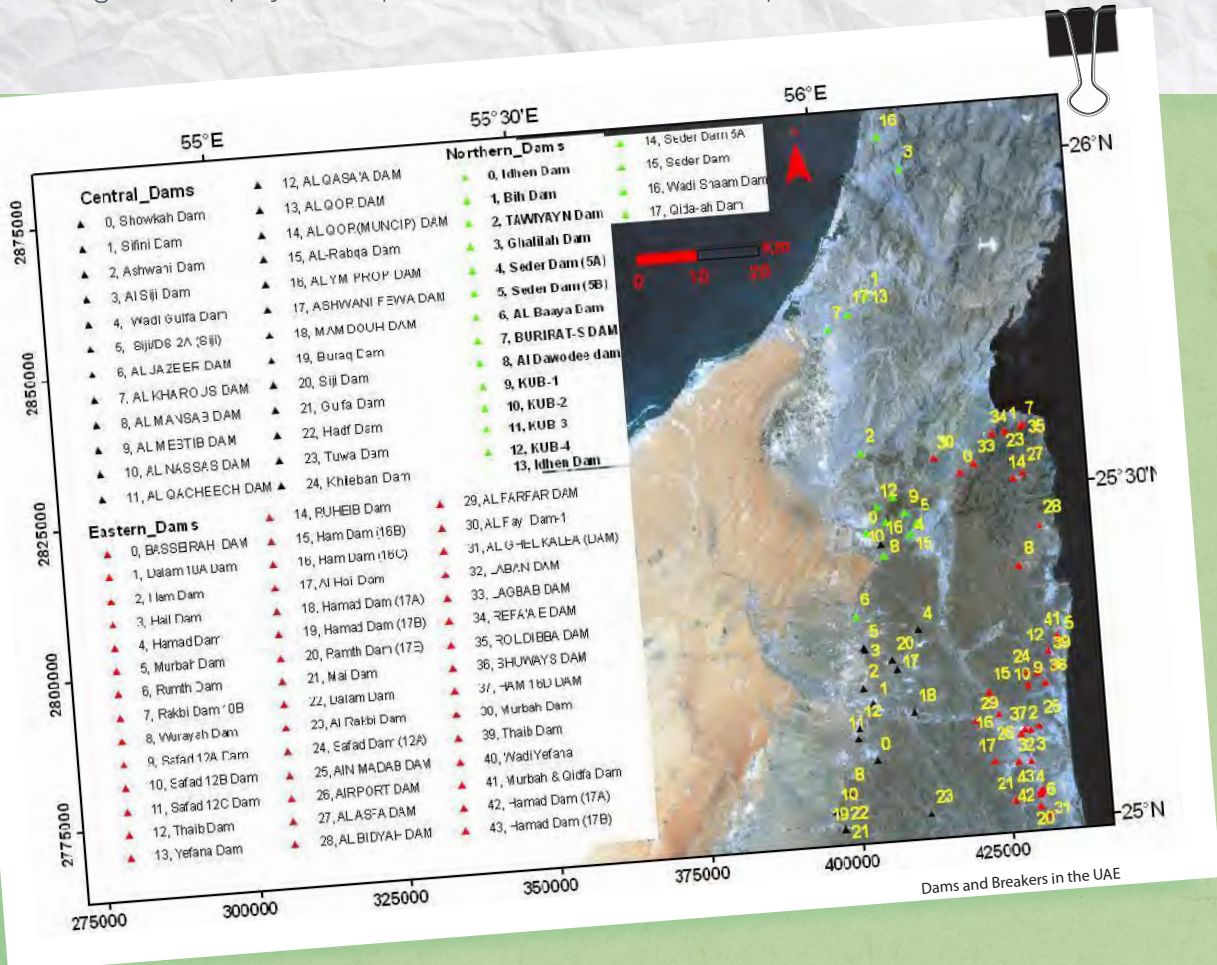
Some project highlights include the following:

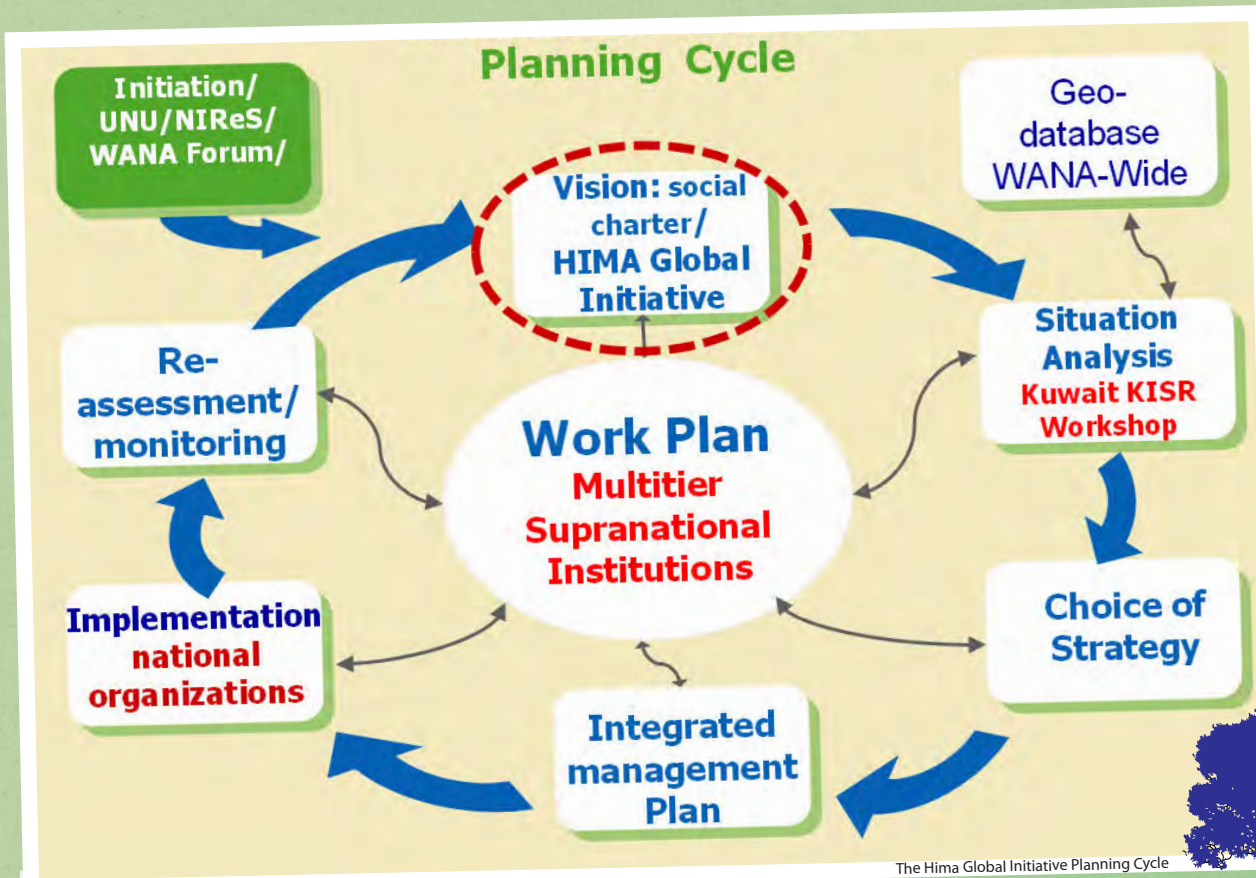
In the Bolivian altiplano, researchers are working together with local communities to improve crop yields of quinoa production. Until recently, quinoa was a staple crop for local Bolivianos; however, due to recent demand for quinoa from developed countries, quinoa production has rapidly increased, resulting in increased desertification and less availability on the local market. This project site is exploring options for sustainably increasing yield production to satisfy international demand while re-inserting quinoa into local markets.

In China, plans are underway to establish the largest eco-husbandry demonstration site in China's grasslands for the restoration of degraded ecosystems; this is based on the research undertaken in the SUMAMAD local project site, where the introduction of free-range chicken farming has become a sustainable option for improving land use while providing options to local communities for the diversification of their livelihoods.

Optimization and Enhancement of Groundwater Recharge in UAE

This project, undertaken in collaboration with and support from the United Arab Emirates (UAE) Government, aims to examine the effectiveness of dams in recharging groundwater aquifers. These aquifers serve as a major source of water supply for agricultural, and to a lesser degree, industrial uses. Their sustainable use over the long term requires an adequate balance between water withdrawal and recharge. Such a balance must also account for changes in rainfall patterns resulting from global climate change. The project has assessed existing water harvesting techniques at 15 study sites and reviewed alternative methods available. The project relies on participatory evaluation techniques involving local communities in order to assess the impact of water utilized for irrigation as well as flood and erosion control measures. The project also entails significant capacity development, in particular through engagement of PhD and MSc students on the project locations. It is anticipated that the project will lead to better land and water management in UAE. These results are also transferrable to other arid and semi-arid countries throughout the region. Such cross-fertilization of ideas is explicitly included in the project design through engagement of the SUMAMAD project teams from Tunisia, Iran, and Jordan. Based on two expert workshops and field investigations, UAE initiated a field implementation of the recommendations in 2012 and nine recharge wells were installed in the dams covered by this project. For the next two years, the UNU-INWEH expert team will observe the performance of these recharge wells against the field conditions during the rainy season. A book that incorporates all the stages of the project's implementation is under development.





The Global HIMA Initiative

The Arabic word “Hima” literally means “a protected area”. The Hima is a traditional community-based environmental resources management system that has been practiced for more than 1500 years in the Arabian Peninsula. It is a well-known concept for securing sustainable use of natural resources by and for the people, which gives due consideration to interactions between nature conservation and human well-being. The Human Integrated Management Approach (HIMA) initiative was publicly launched as the Global HIMA Initiative during the Annual West Asia and North Africa (WANA) Forum in May 2012. A consultative and planning workshop took place in Kuwait City in December 2012, with the aim to develop an implementation strategy for a HIMA governance system and to share international experiences among stakeholders and to strengthen information networks and knowledge management systems. The workshop addressed a strategy for including HIMA in regional protected area management on the basis of clearer policies and legislation relating to natural resources governance engrossing indigenous peoples and local communities. The workshop was co-organized by UNU-INWEH, the Kuwait Institute for Scientific Research, Newcastle Institute for Research on Sustainability, the West Asia and North Africa (WANA) Forum with funding from the Kuwait Foundations for the advancement of Sciences (KFAS), and the Islamic Development Bank (IDB).

Stories from the Field: Master's of Science in Drylands Management



Photo reel: MSc Drylands students on the field and in the classroom



The Joint Master's Degree (MSc) Programme on Integrated Drylands Management brings together different expertise and scientific resources of the partner institutes to build advanced human capital, and to generate and adapt global knowledge for local solutions in drylands. The programme provides young professionals and scientists an international perspective on integrated resources management approaches in drylands and allows them to gain practical experience in different dryland countries. It particularly prepares students for careers on all aspects of development, including government service, international agencies, and teaching and research in institutions of higher learning. For example, upon completion of the programme, Mie Minamoto, a third cycle student, joined the Japan Overseas Cooperation Volunteers and worked on re-forestation in rural areas of Mali and Burkina Faso threatened by desertification. Toshio Sato, another cycle student, is currently pursuing PhD studies with Tottori University in Japan on the use of wastewater and the bio-availability of heavy metals.

This programme is offered jointly through the partnership between UNU and:



CIHEAM
IAM BARI



Progress Report: Water-Health Nexus Activities & Projects

Study Quantifies Effects of Safe Water and Sanitation

Dirty water and sewage have long been known to be health threats, but an upcoming United Nations report shows just how devastating their toll is on mothers and young children.

- USA TODAY

PUR Purifier of Water
For 10 litres of Water
NET CONTENTS: 4L



Hydrosanitas

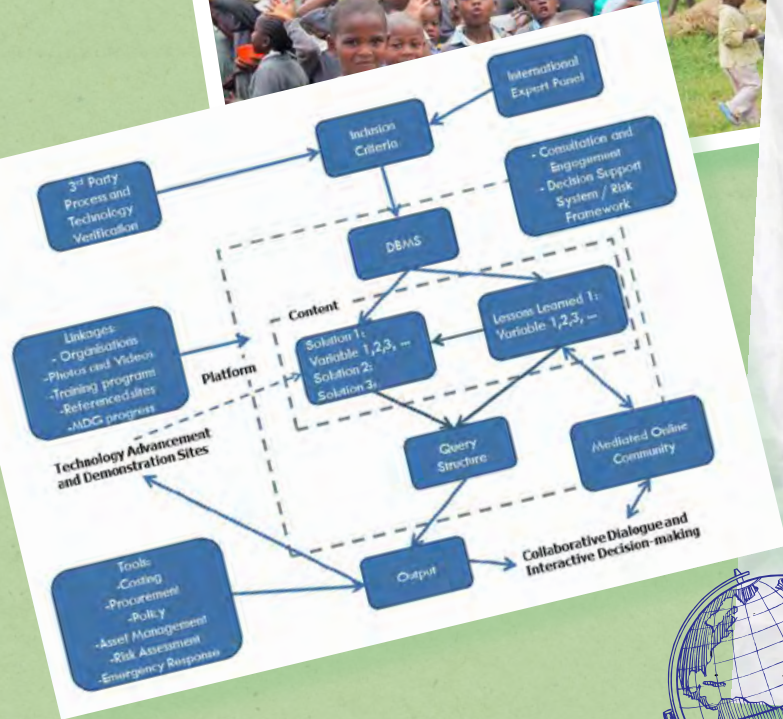
Hydrosanitas is an **interactive** online global knowledge portal for safe water provisioning.

This tool is designated to overcome the fragmentation that exists in the water sector in order to:

- transfer knowledge to communities for enhanced decision-making around providing their members with safe water;
- provide technology developers, researchers, consultants, and practitioners with a grassroots knowledge of, and social and cultural context for, the needs, gaps, and opportunities which exist in providing safe drinking water for rural, remote, and otherwise marginalised communities around the world.

Highlights: Based upon the KIM-UNU platform, this is a decision support tool for providing safe water to remote communities. It is a "one start shop" portal for NGOs, international agencies, government, and the private sector. A beta version is ready for partner and stakeholder feedback.

Project Vision: Online communities and on-the-ground demonstration sites.



Knowledge, Attitudes, Practices, Empowerment (KAPE)

The goal of the KAPE initiative is to understand community practices and perceptions around linkages between water, environment, and health in order to determine social factors for sustainable water interventions. The first phase of the initiative has been to support the community of Usoma, Kenya in providing its residents with access to reliable and sustainable potable water and environmentally-friendly sanitation. The project will serve as an economic and social catalyst for the community and will enhance capacity, provide financing for expansion of services, and improve general health and well-being. Moreover, it will be used as a demonstration site in the region as a model for community-owned solutions to rural water supply and sanitation access issues.

In 2012, a draft community proposal was prepared and submitted to industrial partners. Kenya Pipeline Company and Kisumu Water and Sewerage Corporation (KIWASCO) joined as local partners, providing access to leveraged funds and Ministry of Water and Environment programmes. Kenya Medical Research Institute (KEMRI) is a strong institutional partner in Kisumu. COHESU, an NGO directed by Diana Karanja of KEMRI, is responsible for local coordination. The project was partly funded by the Rotary Club of Hamilton.



Usoma land-owner donates land for water and sanitation project in Kenya

Photo credit: Diana Karanja

KAPE Accomplishments to Date

- ✓ Formalization of the Usoma Water Advisory Committee
- ✓ Establishment of Usoma Water Committee
- ✓ Voluntary land donations
- ✓ Geosurveying
- ✓ Youth training program
- ✓ Interlocking brick making
- ✓ Brick sale
- ✓ Bore hole
- ✓ Biogas
- ✓ Municipal pipeline
- ✓ School WaSH facilities



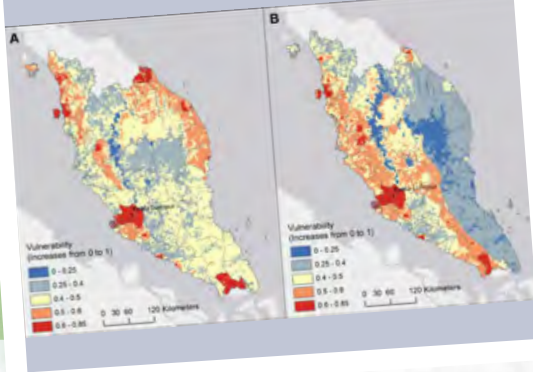


Community clean-up event in Seremban, Malaysia



Mapping community locations of Dengue risk in Malaysia

WADI Performance: June to December



Community Mapping (WADI Initiative)

WADI (Water Associated Disease Index)



There is a clear need for measures to combat the high burden of illness from water-associated diseases. A large burden of this illness is borne by groups with high vulnerability and little ability to invest in resilience-building activities.

WADI applies an ecosystem-based approach that integrates disparate information types from the physical and social environment into an index to identify and visualize areas of vulnerability to individual water-related diseases. The WADI approach has been applied to Dengue in Malaysia and will be expanded to schistosomiasis in the Lake Victoria Basin in 2013. It is clear that while Dengue is considered a neglected tropical disease, its relationship with the built environment is more complex. WADI:Dengue has been applied at the sub-national and local scales. Sarah Dickin, a PhD student, spent several months in Malaysia undertaking key-informant interviews, public health training in eco-health approaches, and community focus groups as well as engaging in community clean-up activities. Another PhD student working on the project, Kate Mulligan, completed her PhD in 2012 and is now working with the Toronto Public Health Unit.

Stories from the Field: Women and Water: Dignity, Innovation and Leadership

"When I became the first Minister of Water and Environment for the Republic of Uganda, I was still going down to the stream at the back of our house to collect water every morning."
- M. Mutagamba



About Minister Mutagamba:

A member of the UN Secretary-General's Advisory Board for Water and Sanitation; first Minister of Water and Environment for the Republic of Uganda; past-president of the African Ministers' Council on Water; coordinator of the Global Women Leaders Forum for Water and Sanitation; recognized and accorded the title of "Mama Africa for WASH" during the 2012 Africa Water Week.

UNU-INWEH Water Catalyst Award Winner



The Hon. Maria Mutagamba receives UNU-INWEH Water Catalyst Award, sponsored by Degremont

Women and Water: Dignity, Innovation and Leadership 18–20 September, 2012

To draw attention to the key role of women in the management of water around the world, and to share knowledge and solutions on the global water crisis, the Hon. Maria Mutagamba, one of Africa's most powerful advocates on WaSH issues, took part in a series of three UN-affiliated events in Hamilton, Toronto, and Ottawa. During the event, Minister Mutagamba was awarded the inaugural UNU-INWEH Water Catalyst award, sponsored by Degremont.

The three panel events built upon each other, applying different lenses to the global water and sanitation crisis. Among topics that were highlighted: the most critical world WaSH concerns confronting humanity today; the contributions of women in addressing the global water crisis; smart investing in the global WaSH crisis; and harnessing the "mucky middle", where top-down and bottom-up approaches interact, to ensure universal WaSH for rural, remote, and otherwise marginalized communities, and create sustainable change.

Stories from the Field:

Water Without Borders



Water Without Borders is training the next generation of trans-disciplinary water researchers in water, environment, and health: researchers with the ability to bridge science and policy, educators with skills in community capacity building, and water professionals with a global focus.

Graduate Profile: Dona Geagea

Dona Geagea is a graduate of McMaster's Globalization Studies Programme and the WWB Programme. Currently, she is the hub manager of Waterlution's Toronto and Southern Ontario region.

"I had proposed to do my thesis around water governance, so I thought the Water Without Borders programme was a perfect match...[and] the connections I've made have helped me pull together numerous events in my current role at Waterlution."

- Dona Geagea



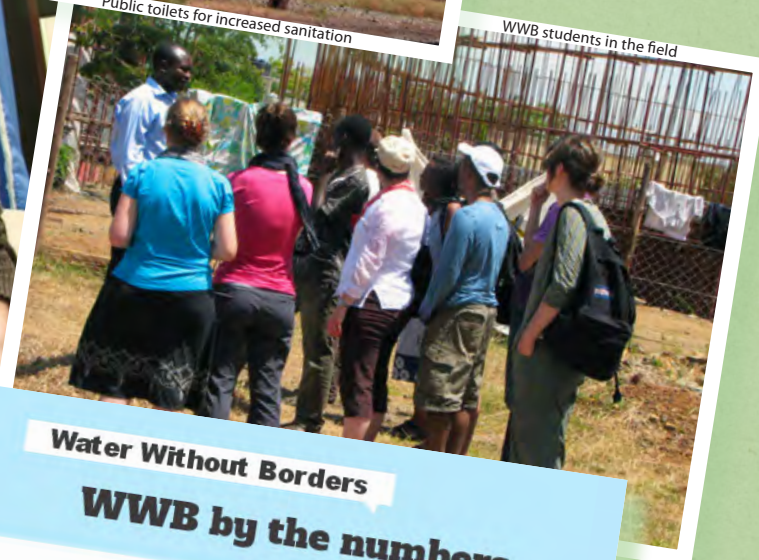
Water Without Borders Graduate, Dona Geagea

Photo credit: Dona Geagea

Kristin Pouw receives her WWB diploma at the annual WWB's wine and cheese reception



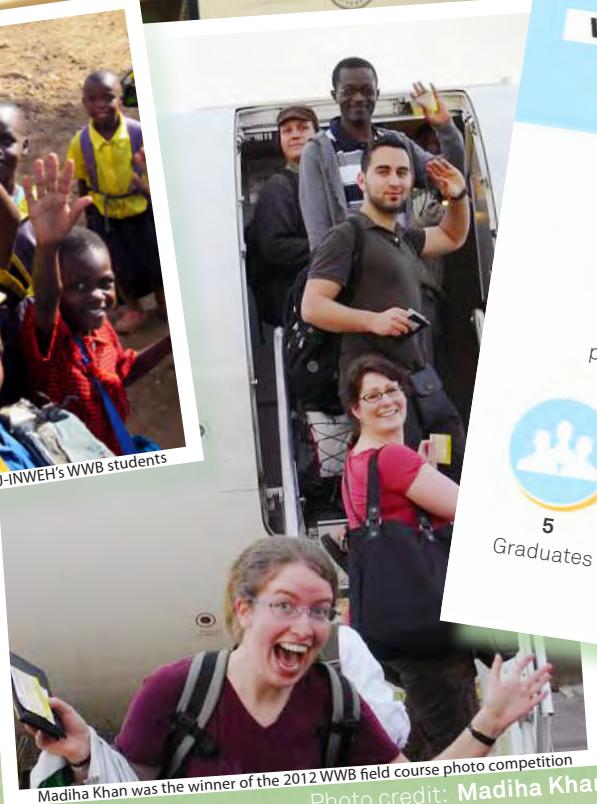
Public toilets for increased sanitation



WWB students in the field



School children welcome UNU-INWEH's WWB students



Madiha Khan was the winner of the 2012 WWB field course photo competition

Photo credit: Madiha Khan

Water Without Borders

WWB by the numbers

3 Years since the programme began	23 Students enrolled to date	3 Field trips to East Africa (Kenya and Uganda)
5 Graduates	1 International Water Week Ambassador	1 Vanier Scholar
		1 NERSC Julie Payette Scholar

UNU-INWEH Publications 2012



To download a free PDF copy of any of the publications listed below, visit:

<http://www.inweh.unu.edu/publications.htm>



UNITED NATIONS
UNIVERSITY

UNU-INWEH

- Babel, M. and E. Karar, 2012. *IW Science Report: River Basins — A Global Analysis of River Basins Science and Transboundary Management*. Hamilton, Canada: UNU-INWEH.
- Babel, M. and E. Karar, 2012. *IW Science Report: River Basins — A Global Synopsis of River Basins Science and Transboundary Management*. Hamilton, Canada: UNU-INWEH.
- Bigas, H. (Ed.), 2012. *The Global Water Crisis: Addressing an Urgent Security Issue*. Papers for the InterAction Council, 2011-2012. Hamilton, Canada: UNU-INWEH.
- Cabanban, A. and L. Mee, 2012. *IW Science Report: Large Marine Ecosystems and the Open Ocean — A Global Analysis of Large Marine Ecosystems and the Open Ocean Science and Transboundary Management*. Hamilton, Canada: UNU-INWEH.
- Cabanban, A. and L. Mee, 2012. *IW Science Report: Large Marine Ecosystems and the Open Ocean — A Global Synopsis of Large Marine Ecosystems and the Open Ocean Science and Transboundary Management*. Hamilton, Canada: UNU-INWEH.
- GEF, UNDP, UNOPS and UNU-INWEH, 2012. *From Community to Cabinet — Two Decades of GEF Action to Secure Transboundary River Basins and Aquifers*. Hamilton, Canada: UNU-INWEH.
- Kremer, H. and R. Ramachandran, 2012. *IW Science Report: Land-Based Pollution Sources — A Global Analysis of Land-Based Pollution Sources Science and Transboundary Management*. Hamilton, Canada: UNU-INWEH.
- Kremer, H. and R. Ramachandran, 2012. *IW Science Report: Land-Based Pollution Sources — A Global Synopsis of Land-Based Pollution Sources Science and Transboundary Management*. Hamilton, Canada: UNU-INWEH.
- Mee, L. and Z. Adeel, 2012. *Science-Policy Bridges Over Troubled Waters — Making Science Deliver Greater Impacts in Shared Water Systems*. Hamilton, Canada: UNU-INWEH.
- Munkittrick, K., G. Constantin and M. Servos, 2012. *IW Science Report: Lakes — A Global Analysis of Lakes Science and Transboundary Management*. Hamilton, Canada: UNU-INWEH.



Munkittrick, K., G. Constantin, and M. Servos, 2012. *IW Science Report: Lakes — A Global Synopsis of Lakes Science and Transboundary Management*. Hamilton, Canada: UNU-INWEH.

Van Lavieren, H., M. Spalding, D. Alongi, M. Kainuma, M. Clüsener-Godt and Z. Adeel, 2012. *Securing the Future of Mangroves. A Policy Brief*. UNU-INWEH, UNESCO-MAB with ISME, ITTO, FAO, UNEP-WCMC and TNC. 53 pp.

Sale, P.F. and A.M. Szmant (Eds.), 2012. *Reef Reminiscences: Ratcheting Back the Shifted Baselines Concerning What Reefs Used to Be*. Hamilton, Canada: UNU-INWEH, 35 pp.

Shaxson, L. with A.T. Bielak et al., 2012. *Expanding our Understanding of K* (KT, KE, KTT, KMB, KB, KM, etc.) A Concept Paper Emerging From the K* Conference Held in Hamilton, Ontario, Canada, April 2012*. Hamilton, Canada: UNU-INWEH, 30pp + appendices.

Tujchneider, O. and J.v. der Gun, 2012. *IW:Science Report: Groundwater — A Global Analysis of Groundwater Science and Transboundary Management*. Hamilton, Canada: UNU-INWEH.

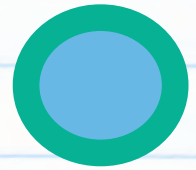
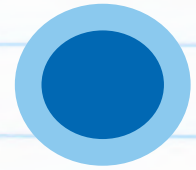
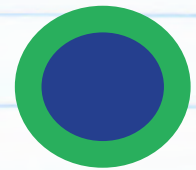
Tujchneider, O. and J.v. der Gun, 2012. *IW:Science Report: Groundwater — A Global Synopsis of Groundwater Science and Transboundary Management*. Hamilton, Canada: UNU-INWEH.



UNU-INWEH Partnerships

Research Partnerships

- African Centre for Climate and Earth Systems Science (ACCESS), Kenya
- Assembly of First Nations, Canada
- Brock University, Canada
- Canadian Water Network (CWN)
- Central Arid Zone Research Institute (CAZRI), India
- Centre Nationale pour la Recherche Scientifique et Technologique (CNRST), Burkina Faso
- Centre for Alternative Wastewater Treatment, Fleming College, Canada
- Centre for Community Mapping (CoMap), Canada
- DesertNet International
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
- European Lifestyles and Marine Ecosystems (ELME)
- Global Environment Facility (GEF)
- Government College University (GCU) Lahore, Pakistan
- Great Lakes Fishery Commission (GLFC)
- Institute of Botany, The Chinese Academy of Sciences (CAS), China
- International Center for Agricultural Research in the Dry Areas (ICARDA)
- International Development Research Centre (IDRC)
- International Food Policy Research Institute (IFPRI)
- International Joint Commission (IJC)
- International Society for Mangrove Ecosystems (ISME)
- International Tropical Timber Organization (ITTO)
- International Water Management Institute (IWMI)
- Kuwait Institute of Scientific Research (KISR)
- Lake Tanganyika Authority (LTA)
- Lake Victoria Basin Commission (LVBC)
- Lake Victoria Fisheries Organization (LVFO)
- Land-Ocean Interactions in the Coastal Zone (LOICZ)
- National Environment and Planning Agency (NEPA), Jamaica
- Overseas Development Institute (ODI)
- Pakistan Council of Research in Water Resources (PCRWR), Pakistan
- Research Society for Sustainable Rehabilitation of Drylands (REaSSRED), Iran
- Scottish Association for Marine Sciences (SAMS)
- Stockholm Environment Institute (SEI), Sweden
- The Royal Society for the Conservation of Nature (RSCN), Jordan
- The Center for Development Research (ZEF), University of Bonn
- The InterAction Council (IAC)
- Trojan Technologies, Inc.
- Universidad Mayor de San Andrés, Bolivia
- University of Plymouth
- University of Queensland, Australia
- Walter & Duncan Gordon Foundation
- West Asia and North Africa Forum (WANA Forum), Jordan
- World Bank



UN System

- Food and Agriculture Organization (FAO)
- The Global Mechanism of the UNCCD (GM)
- UN-Water
- UN-Water Decade Programme on Capacity Development (UNW-DPC)
- United Nations Convention to Combat Desertification (UNCCD)
- United Nations Department of Economic and Social Affairs (UNDESA)
- United Nations Development Programme (UNDP)
- United Nations Economic and Social Commission for Western Asia (UNESCWA)
- United Nations Environment Programme (UNEP)
- United Nations Organization for Education, Science and Culture (UNESCO)
- World Health Organization (WHO)
- UNU Family: UNU-EHS, UNU-FLORES, UNU-IIGH, UNU-ISP, UNU-INRA, UNU-MERIT, UNU-IIST



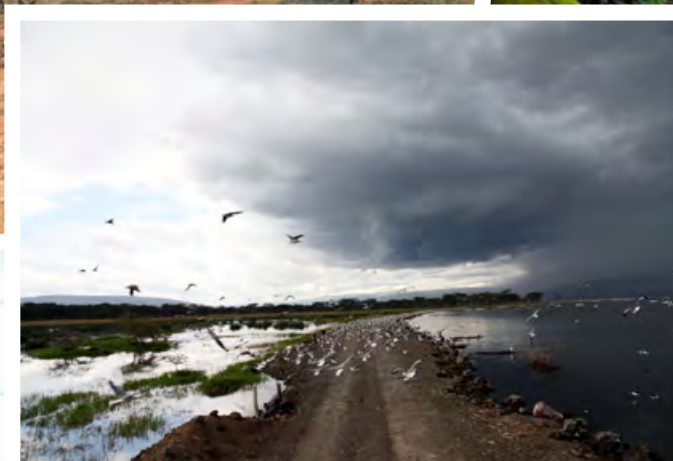
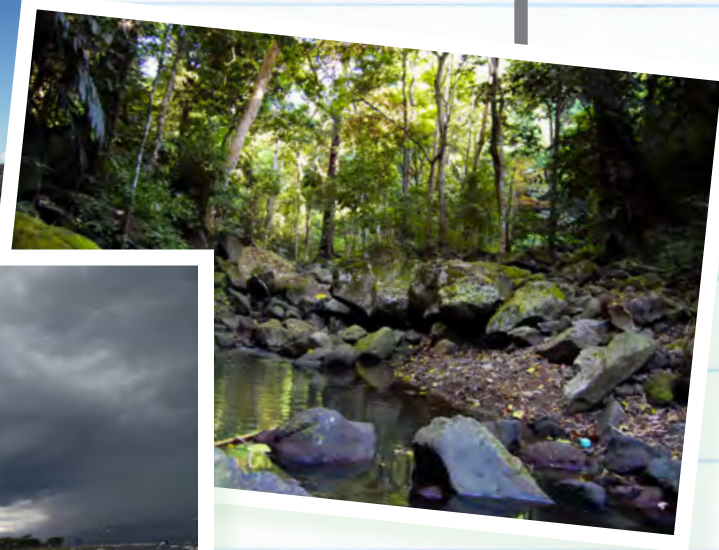
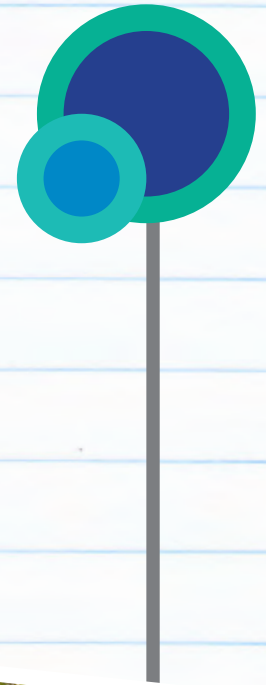
Academic Partnerships (Linked to Joint/Shared Academic Programmes)

- Alexandria University, Egypt
- Arabian Gulf University, Bahrain
- Arid Land Research Centre, Tottori University (TU), Japan
- Asian Institute of Technology, Thailand
- Carleton University, Canada
- CATHALAC, Panama
- Cold and Arid Regions Environmental & Engineering Research Institute (CAREERI) of the Chinese Academy of Sciences (CAS), China
- The Global Mechanism of the UNCCD
- Institut des Régions Arides (IRA), Tunisia
- Institut National Agronomique de Tunisie (INAT), Tunisia
- International Center for Advanced Mediterranean Agronomic Studies – Mediterranean Agronomic Institute, (CIHEAM-Bari), Italy
- International Center for Agricultural Research in the Dry Areas (ICARDA)
- McMaster University, Canada
- University of Nairobi, Kenya

Capacity Development Partnerships

- Annamalai University, India
- City of Hamilton, Canada
- The Nature Conservancy, Canada
- Uganda Christian University, Uganda
- Walkerton Clean Water Centre, Canada

UNU-INWEH has been working with Alexandria University through a gradual, step-wise process to establish a joint research facility, as a precursor to setting up a twin institute.



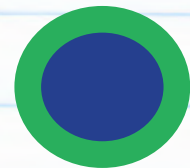
UNU-INWEH Donors

Sources of Funding

Core funding is provided by the Canadian Government through the Canadian International Development Agency (CIDA). The present grant arrangement (April 2012–March 2015) provides C\$ 2 million per year. Project-based funding is sought for all projects; below is a list of donors over the past five years.

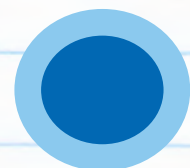
Major Donors (Over US\$100,000)

- The Arab Fund, Kuwait
- Arab Gulf Program for Development (AGFUND), Saudi Arabia
- Canadian International Development Agency (CIDA), Canada
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Germany
- European Union (via the Government of Jordan)
- The Flemish Government of Belgium (via UNESCO)
- Global Environment Facility (via UNEP, UNOPS, UNDP and U. of Queensland)
- Ministry of Water and Environment, United Arab Emirates
- UN-Water
- World Bank



Other Donors

- Canadian Water Network (CWN)
- Canadian Institutes of Health Research (CIHR)
- Canadian Government (Natural Resources Canada)
- City of Hamilton
- Diversitas
- Environment Canada
- Icelandic Soil Conservation Service
- International Center for Agricultural Research in the Dry Areas (ICARDA)
- International Development Research Centre (IDRC)
- International Geosphere Biosphere Programme (IGBP)
- International Human Dimensions Programme (IHDP)
- International Water Management Institute (IWMI)
- Natural Resources Canada
- Public Health Agency of Canada
- Rotary Club of Hamilton
- Social Sciences and Humanities Research Council (SSHRC)
- UN-Water Decade Programme on Capacity Development (UNW-DPC)
- Walter & Duncan Gordon Foundation



The UNU-INWEH *Team*

Dr. Zafar Adeel, Director

Coastal Ecosystems Programme

Ms. Lisa Benedetti, Project Associate & Internship Coordinator

Prof. Peter Sale, Assistant Director

Ms. Hanneke Van Lavieren, Programme Officer & Latin America and Caribbean Region Coordinator

Freshwater Ecosystems Programme

Mr. Furqan Asif, Project Assistant

Dr. Alex Bielak, Senior Research Fellow

Mr. Andrew Dansie, Research Fellow

Dr. Jennifer Durley, Project Officer

Prof. Colin Mayfield, Assistant Director

Mr. Nabil Mouloud, Information Technology Associate & Database Administrator

Ms. Jackie Yip, Project Assistant

Dryland Ecosystems Programme

Ms. Harriet Bigas, Project Officer

Dr. Manzoor Qadir, Senior Research Fellow

Dr. Emmanuelle Quillerou, Project Officer

Dr. Walid Saleh, Head of Middle East North Africa (MENA) Regional Programme

Dr. Richard Thomas, Assistant Director

Water-Health Nexus Programme

Ms. Kate Cave, Project Assistant

Prof. Chris Metcalfe, Senior Research Fellow

Ms. Katherine Pizzacalla, Project Assistant

Dr. Corinne Schuster-Wallace, Programme Officer

Office Support

Ms. Maria Baby, Senior Accounting Clerk

Mr. Bradley Berquist, Head of Programme Services

Ms. Ann Caswell, Office Administrator

Mr. Terry Collins, Communications Advisor

Ms. Irene Gaerdes, Assistant to the Director/HR Coordinator

Ms. Carly Popenko, Creative Designer & Office Assistant

Ms. Carrie Waluchow, Office Assistant & Creative Designer

Senior Advisor to UNU-INWEH Director

Dr. Peter George, McMaster University

Adjunct Professors at UNU-INWEH

Prof. Altaf Arain, McMaster University

Prof. Sarah Dickson, McMaster University

Prof. Ken Drouillard, University of Windsor

Prof. Susan Elliott, University of Waterloo

Prof. Gail Krantzberg, McMaster University

Prof. Kelly R. Munkittrick, University of New Brunswick

Prof. Mark Rosenberg, Queen's University

Prof. Susan Watt, McMaster University

UNU-INWEH IAC

Members of UNU-INWEH International Advisory Committee

The IAC comprises the following individuals, who have each been selected due to their expertise and linkages relevant to our programmes and activities. The following members are presently serving:

Prof. Fatma Abdel Rahman Attia

Professor Emeritus, National Water Research Center, Egypt
Expertise: Groundwater issues

Dr. Johann Bell

Senior/Principal Fisheries Scientist, Strategic Engagement, Policy and Planning Facility, Secretariat of the Pacific Community (SPC), New Caledonia
Expertise: Fisheries

Prof. Ulisses E.C. Confalonieri

National School of Public Health, Rio de Janeiro, Brazil
Expertise: Climate change and health issues

Dr. Roberto L. Lenton

Founding Executive Director, Robert B. Daugherty Water for Food Institute, University of Nebraska, USA
Expertise: Global development agenda, food security

Dr. Melita Samoily

Director, CORDIO, Nairobi, Kenya
Expertise: Tropical coastal ecosystems

Prof. Patricia Wouters

Founding Director, UNESCO Centre for Water Law, Policy and Science, University of Dundee, United Kingdom
Expertise: Water law, water security



**United Nations University
Institute for Water, Environment and Health**

175 Longwood Road South, Suite 204
Hamilton, ON Canada L8P 0A1
1-905-667-5511
www.inweh.unu.edu
facebook.com/UNUINWEH

