

South Asia Regional Environmental Security Forum



June 2-5, 2014 ♦ Malé, Republic of Maldives



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SOUTH ASIA REGIONAL ENVIRONMENTAL SECURITY FORUM MALDIVES 2014

Dear Forum Participant,

On behalf of the Maldives National Defence Force and the U.S Pacific Command, we welcome you to the Republic of Maldives and the 2014 Regional Environmental Security Forum (RESF). The three previous environmental security conferences in Honolulu, Jakarta and Sydney laid the foundation for this year's agenda, with emphasis on Water Security, Waste Management, Resource Protection, and Energy.

The RESF seeks to develop awareness and partnerships in environmental security throughout the Asia Pacific region and considers the contributions to address waste-stream management in a civil-military context, share sustainable and integrated water resource solutions and best practices, showcase regional alternative energy approaches, identify ways for militaries to increase resource protection, and to develop a "network of networks" of experienced military environmental planners to assist in operations and planning. Importantly, the RESF seeks to identify future environmental security initiatives, which can be operationalized in the field.

We are honoured that you have made your time available to attend, and very much welcome your participation over the next four days and beyond.

This welcome package includes the agenda, information paper, speaker biographies, presentation summaries, table-top exercise scenario, evaluation form and information about Malé and the Maldives. Please contact the event organisers if you have questions.

With our best wishes for a successful forum.

Major General Ahmed Shiyam
Chief of Defence Force
Maldives National Defence Force

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AGENDA



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AGENDA

DAY 1 - WATER SECURITY



MONDAY, 02 JUNE 2014 (Dress Code: Business Casual)

0 7 3 0 - 0 8 3 0	REGISTRATION
0 8 3 0 - 0 9 2 0	Opening Ceremony Comments by: <i>Major General Richard Stevens, Commander, U.S. Army Corps of Engineers, Pacific Ocean Division</i> and <i>HE COL (Ret.) Mohamed Nazim, Minister, Ministry of Defence and National Security, Republic of Maldives</i>
0 9 2 0 - 0 9 3 0	GROUP PHOTO
0 9 3 0 - 0 9 4 5	Introduction to Water Security Theme <i>Major General Richard Stevens, Commander, U.S. Army Corps of Engineers, Pacific Ocean Division</i>
0 9 4 5 - 1 0 1 5	Water: A Potential Trigger for Conflicts? <i>Dr. Herath Manthrithilake, Head, Sri Lanka Development Initiative, International Water Management Institute</i>
1 0 1 5 - 1 0 4 5	BREAK
1 0 4 5 - 1 1 1 5	Grounding the Water Security Debate: Balancing 'Eagle-Eye' and 'Toad-Eye' Sciences for Semi-Arid South Asia <i>Mr. Dipak Gyawali, Minister (Former), Ministry of Water Resources, Nepal</i>
1 1 1 5 - 1 1 4 5	Maldivian Water Security Concerns <i>Mr. Mohamed Rasheed, Head of Operations, Male Water & Sewerage Company, Republic of Maldives</i>
1 1 4 5 - 1 2 3 0	Water Security Panel Session <i>(Moderated by Major General Richard Stevens, Commander, U.S. Army Corps of Engineers, Pacific Ocean Division)</i>
1 2 3 0 - 1 3 3 0	WORKING LUNCH <i>(Video: Leadership for Water Security in Asia and the Pacific)</i>
1 3 3 0 - 1 4 0 0	Integrated Water Resource Management: Shared Vision Planning Overview <i>Dr. Michelle Haynes, IWRM Specialist, U.S. Army Corps of Engineers, Institute for Water Resources</i>
1 4 0 0 - 1 5 0 0	Integrated Water Resource Management - Interactive Session <i>Work Groups</i>
1 5 0 0 - 1 5 3 0	BREAK
1 5 3 0 - 1 6 3 0	Integrated Water Resource Management - Outcomes & Results <i>Work Groups</i>
1 6 3 0 - 1 6 4 5	Day 1 Summary
1 8 0 0 - 1 8 3 0	Travel to Kuda Bandos Island
1 8 3 0 - 2 1 0 0	ICEBREAKER Kuda Bandos Beach
2 1 0 0 - 2 1 3 0	Travel to Kurumba Island

DAY 2 - WASTE MANAGEMENT

TUESDAY, 03 JUNE 2014 (Dress Code: Business Casual)

0 9 0 0 - 0 9 1 5	Introduction to Waste Management Theme <i>Mr. Mohamed Musthafa, Director, Environmental Protection Agency, Republic of Maldives</i>
0 9 1 5 - 0 9 4 5	Post-Disaster Debris Clearance: Rana Plaza Building Collapse <i>Brig Gen Ibne Fazal Shayekhuzzaman, Director, National Telecommunication Monitoring Centre, Ministry of Home Affairs, Bangladesh</i>
0 9 4 5 - 1 0 1 5	Regional Approaches to Solid Waste Management in South Asia <i>Ms. Chamina Priyankari Alexander, Programme Officer, South Asia Co-operative Environment Programme</i>
1 0 1 5 - 1 0 4 5	Desktop Demonstration of a Waste Management Unit in an Island Environment <i>Ms. Nicole Griffin, Environmental and Energy Manager, U.S. Marine Corps Forces, Pacific</i>
1 0 4 5 - 1 1 1 5	BREAK
1 1 1 5 - 1 2 0 0	Waste Management Panel Session <i>Mr. Mohamed Musthafa, Director, Environmental Protection Agency, Republic of Maldives</i>
1 2 0 0 - 1 2 3 0	Maldives Solid Waste Management Tour Overview <i>Lt Col Ahmed Ghiyas, Principal Director of Operations & Training, Maldives National Defence Force, Republic of Maldives</i>
1 2 3 0 - 1 3 3 0	WORKING LUNCH (Video: Waste to Energy Systems Demonstrations)
1 3 3 0 - 1 4 1 5	Travel to Site Visit
1 4 1 5 - 1 6 3 0	Thulusdhoo Island Site Visit
1 6 3 0 - 1 7 0 0	Travel to Hotel

DAY 3 - RESOURCE PROTECTION

WEDNESDAY, 04 JUNE 2014 (Dress Code: Business Casual)

0 9 0 0 - 0 9 1 5	Introduction to Resource Protection Theme <i>Brigadier General Ahmed Shahid, Director General, Department of International Defence Cooperation and Policy, Ministry of Defence and National Security, Republic of Maldives</i>
0 9 1 5 - 0 9 4 5	Payment for Environmental Service: A Tool to Achieve Poverty Reduction & Environmental Security <i>Mr. Keyvan Izadi, PES & REDD+ Advisor, SNV Netherlands Development Organisation - Bhutan</i>
0 9 4 5 - 1 0 1 5	Globalization, Marine Pollution and Regional Environmental Security <i>Dr. Nalin Wikramanayake, Senior Lecturer, Open University, Sri Lanka</i>
1 0 1 5 - 1 0 4 5	Coastal Zone Issues and Challenges in the Maldives <i>Mr. Ibrahim Naeem, Director, SAARC Coastal Zone Management Centre</i>
1 0 4 5 - 1 1 1 5	BREAK
1 1 1 5 - 1 2 0 0	Resource Protection Panel Session <i>Moderated by Brigadier General Ahmed Shahid, Director General, Department of International Defence Cooperation and Policy, Ministry of Defence and National Security, Republic of Maldives</i>
1 2 0 0 - 1 3 0 0	WORKING LUNCH <i>(Video: "Revealed: Himalayan Meltdown," produced by UNDP, Arrowhead Films and the Discovery Channel Asia)</i>
1 3 0 0 - 1 3 3 0	Table-Top Exercise Process Overview <i>Mr. Justin Pummell, Geographer, U.S. Army Corps of Engineers, Institute for Water Resources</i>
1 3 3 0 - 1 4 3 0	Table-Top Exercise: Phase 1
1 4 3 0 - 1 5 0 0	BREAK
1 5 0 0 - 1 6 0 0	Table-Top Exercise Phase 2
1 6 0 0 - 1 7 0 0	Table-Top Exercise Outcomes & Conclusion
1 9 0 0 - 1 9 3 0	Travel to Bandos Island
1 9 3 0 - 2 1 0 0	OFFICIAL DINNER <i>(Bandos Island Resort)</i>
2 1 0 0 - 2 1 3 0	Travel to Kurumba Island

DAY 4 - ENERGY

THURSDAY, 05 JUNE 2014 (Dress Code: Business Casual)

0 9 0 0 - 0 9 1 5	Introduction to Energy Theme <i>Brigadier General Mark M. McLeod, Director for Logistics, Engineering, and Security Assistance, J4, U.S. Pacific Command</i>
0 9 1 5 - 0 9 4 0	Energy Implications for India's Maritime Domain <i>Cdr (Retd) Neil Gadihoke, Research Fellow, Society for Policy Studies</i>
0 9 4 0 - 1 0 0 0	Electricity Supply Security through Regional Cooperation in South Asia <i>Dr. Sandip Shah, Vice President & Country Director, SN Power Holding Singapore Pte. Ltd.</i>
1 0 0 0 - 1 0 2 5	Promoting Decentralised Renewable Energy <i>Dr. Arunabha Ghosh, Chief Executive Officer, Council on Energy, Environment, and Water</i>
1 0 2 5 - 1 0 4 5	The Australian Defence Energy Integration Framework <i>Ms. Jane Holloway, Senior Systems Scientist, Australian Department of Defence</i>
1 0 4 5 - 1 1 1 5	BREAK
1 1 1 5 - 1 2 0 0	Energy Panel Session <i>(Moderated by Brigadier General Mark M. McLeod, Director for Logistics, Engineering, and Security Assistance, J4, U.S. Pacific Command)</i>
1 2 0 0 - 1 3 0 0	WORKING LUNCH <i>(Video: TED Talks: Amory Lovins, "A 40-Year Plan for Energy")</i>
1 3 0 0 - 1 3 3 0	Participant Evaluation Form Completion
1 3 3 0 - 1 4 3 0	Environmental Security Forum After-Action Review by Country <i>(Moderated by Mr. Christopher Sholes, Environmental Program Manager, U.S. Pacific Command)</i>
1 4 3 0 - 1 5 0 0	Closing Ceremony Comments by: <i>HE Michele J. Sison, U.S. Ambassador to Sri Lanka and the Maldives</i> and <i>Honorable Thoriq Ibrahim, Minister of Environment & Energy, Republic of Maldives</i>
1 5 0 0 - 1 5 3 0	Certificate Distribution
1 5 3 0 - 1 6 0 0	AFTERNOON TEA



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INFO PAPER



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14 April 2014

INFORMATION PAPER

SUBJECT: 2014 South Asia Regional Environmental Security Forum

1. Purpose. To provide stakeholders with the concept, background, description and objectives of the 2014 Regional Environmental Security Forum (RESF) scheduled for 2-5 June 2014 in the Republic of Maldives.
2. Background. The 2014 Regional Environmental Security Forum is the fourth annual event led by U.S. Pacific Command (USPACOM). The initial Pacific Environmental Security Conference (PESC) was held in Honolulu, Hawaii in 2011 and featured sessions on 1) climate change adaptation, 2) environmental sustainability, 3) water resource management and 4) disaster preparedness. The PESC was followed by the 2012 Southeast Asia Regional Environmental Security Conference (RESC) in Jakarta, Indonesia. There, fourteen countries met to evaluate top environmental security concerns related to pollution, global warming, deforestation, overfishing and water supply in an ASEAN (Association of Southeast Asian Nations) context. The RESC included a table-top oil spill exercise requiring each country to respond and coordinate with their regional neighbors through the ASEAN Humanitarian Assistance Centre. And in 2013 USPACOM partnered with the Australian Department of Defence, inviting 17 countries to discuss four main themes: 1) sustainable environmental management in military operations from planning to close out; 2) lessons learned from military support to disaster relief operations; 3) managing bio-security risks in the military context; and 4) emerging technologies and new approaches to mitigating and adapting to climate change impacts.
3. General Description.
 - a) Assemblies rotate annually between pan-Pacific and regional meetings. The 2014 event will be a regional effort focused on South Asia.
 - b) USPACOM J4 is partnering with the Maldives National Defence Force (MNDF) to execute the event. The Maldives sent representation to the 2011 and 2013 environmental security engagements and has committed its partnership in support of the successful implementation of the 2014 activity.
 - c) The event will bring together participants from across South Asia, and possibly Oceania, to discuss environmental security as it relates to water security, waste management, resource protection and energy. Each theme will feature presentations by subject matter experts and an interactive panel session. Additionally, an environmental security Table-Top Exercise is planned, as well as integrated water resource management studies and a site visit to Thulusdhoo Island. The event will conclude with a comprehensive After-Action Review where all participants will get to contribute to the final report that will be prepared to summarize the RESF and define the way forward for 2015.

- d) The initial site survey was conducted 13-24 August 2013 in Sri Lanka and the Maldives. The final site survey was completed 23-28 February 2014. Monthly interim progress reviews have been conducted between USPACOM, MNDF and the U.S. Embassy in Colombo.

4. Objectives. The proposed RESF objectives are:

- a) Participatory sharing of lessons-learned, operating procedures and environmental security information.
- b) Develop sustained cooperation between partner nations to ensure sustainable environmental management.
- c) Propose environmental engineering and other mitigation projects for theatre deployment at the tactical/operational level.
- d) Share emerging technologies in climate change mitigation and adaptation at a strategic level.
- e) Develop a “network of networks” of experienced military environmental planners to assist in operations and disaster management.

5. Points of Contact.

Christopher Sholes
Environmental Program Manager
U.S. Pacific Command

United States of America
christopher.sholes@pacom.mil

Lt. Colonel Ahmed Ghiyas
Principal Director,
Directorate of Operations and
Training
Maldives National Defence Force
aqiyaz@gmail.com



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BIOGRAPHIES



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South Asia Regional Environmental Security Forum

Biographies



OPENING CEREMONY

Major General Richard Stevens, Commander, U.S. Army Corps of Engineers, Pacific Ocean Division



On June 30, 2011, Major General Rick Stevens became the 30th Commander and Division Engineer for the Pacific Ocean Division, U.S. Army Corps of Engineers.

As the Division Engineer, he is responsible for a mission that includes engineering design, construction and real estate management for the Army in Hawaii, Army and Air Force in Alaska, and for all Department of Defense agencies in Japan, the Republic of Korea, and Kwajalein Atoll, Marshall Islands.

Pacific Ocean Division administers the Corps' federal water resource development program and waters and wetlands regulatory programs in Alaska, Hawaii, American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands. The Division program includes the \$10 billion multi-year Korea Transformation Program and the \$15.8 billion multi-year U.S.-Japan Defense Policy Review Initiative. Pacific Ocean Division also supports U.S. Pacific Command and U.S. Army Pacific's Theater Security Cooperation strategies, Humanitarian Assistance Program, and Civil Military Emergency Preparedness with projects throughout the Asia Pacific region.

Major General Stevens hails from Vincennes, Indiana, and received his commission as an Engineer officer upon graduation from the United States Military Academy in 1982. He has held a variety of command and staff positions including service with the 101st Airborne Division (Air Assault) at Fort Campbell, Kentucky, Department of Mathematical Sciences at West Point, New York, 3rd U.S. Army in Kuwait and both the 24th and 3rd Infantry Divisions at Fort Stewart, Georgia.

He has served multiple duty assignments within the Headquarters, Department of the Army at the Pentagon, most notably with the Army G-8, Office of the Chief of Engineers and as the Executive Officer to the 36th Army Chief of Staff. He commanded the 11th Engineer Battalion at Fort Stewart, Georgia and the 36th Engineer Brigade at Fort Hood, Texas. His operational assignments include service in Kosovo, Iraq and Afghanistan.

Last year, Major General Stevens was temporarily assigned as the Director, Joint Engineering Directorate, United States Forces-Afghanistan/Combined Joint Engineering Directorate, International Security Assistance Force Joint Command.

He holds Masters of Science degrees in Applied Mathematics from Purdue University and National Security Strategy from the National War College. He also served as an Army Senior Military Fellow at the Brookings Institution in Washington, DC.

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Honorable Colonel (Rtd.) Mohamed Nazim, Ministry of Defense and National Security, Republic of Maldives



Mohamed Nazim became the Minister of Defence and National Security on 8 February 2012. He last served as the Administrative Officer of the Integrated Headquarters of Maldives National Defence Force. At the time he was also the Commanding Officer of the Maldives National Cadet Corps and the President of the Dhivehi Sifainge Club. He held the post of Deputy Commanding Officer of Maldives National Cadet Corps for 6 consecutive years.

Born in Male', Maldives, Minister graduated from Majeediya School prior to his enlistment in March 11, 1987. Upon graduation, Minister Nazim was called in by the government to put his compulsory service to the nation as a soldier. Unlike most of his friends who sought several excuses to evade compulsory military service, he chose to embrace the strenuous life.

Soon after completing basic commissioning course at Royal Military Academy Sandhurst, UK, he was posted as an instructor at the Grifushi Training Centre. In his tenure of 7 years at the training centre he rose to the appointments of Adjutant and later the Commandant. He is also a qualified bodyguard and a bodyguard instructor.

The knowledge and experience acquired from the Training Centre that with his charismatic leadership garnered him the trust from the helm of the organization, endorsing him to many prestigious appointments in his 23 years of dedicated service. He commanded the Quick Reaction Force 2 now inducted to the Marine Corps and the Regional Headquarters Seenu Gan now inducted to the Southern Area Command.

In his secondary area of expertise, disaster management, he has attended many courses and seminars and has acquired extensive knowledge and experience in the field, having formulated many contingency plans for disaster mitigation, relief and evacuation drills.

He completed all the local military trainings that a soldier would undergo in the Maldives before undergoing the advance trainings in School of Infantry and Tactic, Quetta, Pakistan and in Infantry School, Fort Benning, Georgia, USA. Minister is also a graduate of the Mubarak Al Abdullah Command and Staff College, Kuwait, earning excellence in the Master of Military Science Degree program.

He also completed the United Nations Military Observer Course at Malaysian Peacekeeping Training Centre, Malaysia, International Disaster Management Course at Bournemouth University, UK, and Regional Disaster Management Course at Asian Disaster Preparedness Centre, Bangkok, Thailand.

Apart from attending to several workshops, seminars and conferences he is an alumna of Asia-Pacific Centre for Security Studies, College of Security Studies, USA and Near East South Asia Center to Strategic Studies, National Defence University, USA. He is also a member of Association of the United States Army, USA.

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Minister Nazim played a vital role in the formulation of National Disaster Management Plan and Act, establishing and organizing the newly enacted Disaster Management Centre in the wake of India Ocean Tsunami 2004, coordination and execution of bilateral trainings, organizing various types of conferences and national ceremonies, organizing and executing of HOD protection, formulating the MNDF Drill Manual, and formulating various training syllabuses including the MNCC Training Syllabus, are only a few to mention. For his dedicated service, his military awards include the Presidents Ribbon, Dedicated Service Ribbon, Long Service Ribbon, Achievement Ribbon, Ribbon for Special Skill, Presidents Medal, Dedicated Service Medal, November 3rd Medal and Distinguish Service Medal.

He retired from active service on 15 January 2011.

The Minister is married to Afaaf Abdul Majeed, an active working woman. They are blessed with two daughters, Aiminath Vulau and Aishath Luha, and a son, Ahmed Looth.

South Asia Regional Environmental Security Forum

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WATER SECURITY

Major General Richard Stevens, Commander, U.S. Army Corps of Engineers, Pacific Ocean Division



On June 30, 2011, Major General Rick Stevens became the 30th Commander and Division Engineer for the Pacific Ocean Division, U.S. Army Corps of Engineers.

As the Division Engineer, he is responsible for a mission that includes engineering design, construction and real estate management for the Army in Hawaii, Army and Air Force in Alaska, and for all Department of Defense agencies in Japan, the Republic of Korea, and Kwajalein Atoll, Marshall Islands.

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Major General Stevens hails from Vincennes, Indiana, and received his commission as an Engineer officer upon graduation from the United States Military Academy in 1982. He has held a variety of command and staff positions including service with the 101st Airborne Division (Air Assault) at Fort Campbell, Kentucky, Department of Mathematical Sciences at West Point, New York, 3rd U.S. Army in Kuwait and both the 24th and 3rd Infantry Divisions at Fort Stewart, Georgia.

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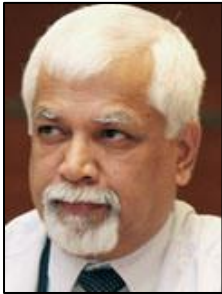
He holds Masters of Science degrees in Applied Mathematics from Purdue University and National Security Strategy from the National War College. He also served as an Army Senior Military Fellow at the Brookings Institution in Washington, DC.

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Dr. Herath Manthrithilake, Head, Sri Lanka Development Initiative, International Water Management Institute



Manthrithilake serves as a Senior Researcher and Head of the research program of International Water Management Institute (IWMI) in Sri Lanka, called “Sustainable Development Initiative”. Prior to this assignment, Manthri lived and worked in India, and Central Asia, representing IWMI and on its research projects. Manthri has experience in leading multidisciplinary and multicultural research teams in several countries. His Ph.D. (obtained in 1983) research was on stochastic hydrology and focused on ‘river flow regimes as Markov Chains; modeling and simulation for the management of river cascades – regulation, and use for agricultural and hydro power production’. Subsequently, published number of scientific papers on variety of topics and has made presentations/communications on different aspects of water management in national, regional and international conferences.

He also served as a resource person (by invitation) in many national, regional and international seminars and workshops, held in Sri Lanka and abroad. He participated in several international projects as a team member, researcher, and resource person for IWMI, ADB, NARBO and FAO.

He possess an extensive experiences serving in several National Science Committees – currently serves in the Natural Resources Committee and in the Socio-economic research committee of the Centre for Agricultural Research Policy (CARP), Water Resource Research Com-tee of National Science Foundation, Research and Training Committee of HARTI, Sri Lanka, Research Evaluation Committee of Institute of Fundamental Studies (IFS), and previously served in National Committee on Space Applications (GIS and RS); Presidential Committee on Water Quality Management; Chairing Steering Committee for establishment of GIS Centre for the Urban Development Authority; Several Steering Committees of different donor funded national projects, etc.).

He possesses extensive experience (since 1977) as a senior government servant. He was the Director of several divisions of the Mahaweli Authority of Sri Lanka (MASL), well known water resource development and river basin management agency. Manthri was successful in establishing and managing a profit- making consultancy (private) company ‘Natural Resources Management Services Pvt. (Ltd) – NRMS’ for the MASL and served as its first Chairman cum Managing Director.

He also has experience in non-profit NGOs – by establishment and management of following independent organizations: Lanka Organic Agricultural Movement – LOAM; served as first President and later as Secretary; Geo Information User Society of Sri Lanka – served as first President of both organizations. He has managed projects funded by donors such as SDC, ODA and DFID of UK, GTZ of Germany, and ADB.

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Mr. Dipak Gyawali, Minister (Former), Ministry of Water Resources, Nepal



Dipak Gyawali is Academician of the Nepal Academy of Science and Technology. By profession, he is a hydroelectric power engineer (Moskovsky Energetichesky Institute, USSR, 1979) as well as a political economist studying resource use (Energy and Resources Group, University of California, Berkeley, 1986). In 2002/2003, he served as Nepal's Minister of Water Resources responsible for power, irrigation and flood control. As a Cultural Theorist upholding the idea of institutional pluralism and its "three-legged policy stool", he was able to initiate the "communitization" of electricity in rural Nepal, the "internal unbundling" of the monopoly electric utility, as well as the privatization of a generation component, which to date in Nepal's history is its largest privatization free from any controversy. He also initiated a very unique indigenous review of the World Commission on Dams report in light of existing Nepali laws, as well as a new irrigation policy that would increase the say of farmers' groups in providing irrigation services. He chairs Interdisciplinary Analysts, a research firm specializing in quantitative social science as well as the newly founded liberal arts college, the Nepê School of Social Sciences and Humanities. He also chairs and directs research at the non-profit Nepal Water Conservation Foundation on alternative local water management.

He was a UNESCO/UNU-IAS Visiting Professor of Water and Cultural Diversity at the United Nations University in Yokohama, Japan in 2010; and has been guest editor of the online journal Water Alternatives for its special issue on World Commission on Dams + Ten Years as well as a forthcoming issue on water-energy-food nexus. He was a member of the panel of experts of the Mekong River Commission reviewing its Basin Development Plan, and currently serves on the Steering Committee of the Mekong Program on Water Environment and Resilience (MPower), actively involved in promoting a Mekong-Ganga Dialogue between South Asia and South-East Asia. In 2013/14 he was an expert consultant to the World Bank's Inspection Panel on a hydroelectric project in the Indian western Himalaya. He has been chair or member of numerous national and international committees and programs on water, development and research: member of the assessment committee reviewing UNESCO-IHE in 2007 and 2012, vice-chair of the Technical Advisory Committee of UN's World Water Assessment Program, member of Coca Cola's International Environmental Advisory Board, member of the advisory board of STEP's Center of IDS Sussex University, etc. His research interest being society-technology interface, he has published extensively in Nepal and internationally.

Mr. Mohamed Rasheed, Head of Operations, Male Water & Sewerage Company, Republic of Maldives



Mr. Mohamed Rasheed has worked for the Male Water & Sewerage Company for the past 18 years. During his time there, he has held multiple titles including Operations Manager, Engineering Manager, Marketing Manager, and Deputy Technical Manager. He has a civil engineering background, with a Bachelor's Degree in Civil Engineering from Bangalore University, a Master's Degree in Business Management & Administration from Lincoln University, and a Master's Degree in Environmental Engineering from AIT. Mr. Rasheed has

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spoken in multiple international conferences and workshops on the topics of water and sewerage. He has been the Operations Manager since February 2014, and is in charge of the overall management of water and sewerage operational services in the eight islands which the Male Water & Sewerage Company portfolio.

Dr. Michelle Haynes, IWRM Specialist, U.S. Army Corps of Engineers, Institute for Water Resources



Dr. Michelle Haynes is an ecologist, decision analyst, and integrated water resources management specialist with the US Army Corps of Engineers, Institute for Water Resources. Her work focuses on advancing and building capacity in domestic and international climate, ecological, and water resource management decisions. Dr. Haynes leads and advises on multi-objective, multi-stakeholder group structured decision making and shared vision planning processes. Projects include enhancing capacity for water security and integrated water resources management in Mongolia, supporting climate and water resilience in SE Asia, adaptive management of multiple objectives including threatened and endangered species in the Missouri River Recovery Management Plan, risk reduction and increasing resilience in Superstorm Sandy Comprehensive Study, and Watershed-informed Budgeting including stakeholder engagement to operationalize integrated water resources management. Dr. Haynes designs, develops, and delivers training curricula including decision analysis, climate change, addressing uncertainty, scenario planning, shared vision planning, collaboration and conflict transformation, to multi-agency staff and leaders.

As a Presidential Management Fellow at the U.S. Fish and Wildlife Service, Dr. Haynes served as a Course Leader at the National Conservation Training Center in Shepherdstown, WV. She led, designed and instructed courses on climate change, vulnerability assessments, scenario planning, adaptation planning, expert elicitation, and structured decision making to professionals from federal agencies, state agencies, Tribes, NGOs, academics, and private corporations. Dr. Haynes developed and instructed training on decision-making to emerging and current leaders in leadership development programs. As a decision analyst, she guided group structured decision making processes and provided decision support to senior managers. Applications included international and domestic ecological, natural resource management, landscape-scale planning, organizational effectiveness and structuring, budget allocation, and climate adaptation decisions, ranging from a single decision-maker to multi-party, multi-stakeholder decision processes.

Dr. Haynes completed her Ph.D. at the University of Wisconsin-Madison, investigating yak herding and climate change impacts on alpine meadows and Tibetan livelihoods in southwest China. Michelle is passionate about international and domestic environmental, climate, and integrated water resources management policy, decision-making and implementation.

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WASTE MANAGEMENT

Mr. Mohamed Musthafa, Director, Environmental Protection Agency, Republic of Maldives



Mr. Mohamed Mustafa is currently the Director of Maldives Environmental Protection Agency, Government of Maldives. He holds a Master's degree in Environment Management Technology from University of Malaya, Malaysia and a Bachelor's degree from the University of Mysore, India. He has vast experience and knowledge on environment in Maldives and in the region, particularly water and wastewater management. He has attended numerous international seminars, conferences and workshops. Conferences he has attended include South Asian Conference on Sanitation 2002, Islamabad

Pakistan, OIC Water Ministers Conference 2012 held in Istanbul, Turkey, South Asian Conference on Sanitation 2013 held in Nepal, etc. He has also undergone various training programs including climate change adaptation and cost benefit analysis, water quality monitoring, water supply engineering, water and wastewater management, groundwater conservation and management, etc.

Brig Gen Ibne Fazal Shayekhuzzaman, Director, National Telecommunication Monitoring Centre, Ministry of Home Affairs, Bangladesh



Brigadier General Shayekh was commissioned in the corps of Engineers in June 1987. Apart from holding a good number of regimental appointments, the officer served in the capacity of Grade 3, Grade 2, Grade 1 and Principal Staff Officer in different headquarters. In instructional capacity, the officer served in Bangladesh Military Academy, School of Infantry and Tactics and also in School of Military Engineering.

Brigadier General Shayekh has participated in First Gulf War in 1991 as the operations officer of an Engineer Battalion. He also participated in UN missions in Sudan and Sierra Leone. He is an engineering graduate from Bangladesh University of Engineering and Technology. He also obtained his graduation from Defense Services Command and Staff College and National Defense College of Bangladesh.

In the fields of disaster management the officer was closely knitted with the flood disaster management of 1987, 1988 and 1998. He also worked closely during the post disaster management of Operation Ghurnijhar (Op Sea Angel 1) of 1991 and Sidr of 2007. As the Principal Staff of 9 Infantry Division, the officer was the prime mover in managing the Rana Plaza Disaster in 2013. The office donated blood for 46 times as a part of his social commitment. Presently, he is serving as Director, National Telecommunication Monitoring Centre under Ministry of Home Affairs of Bangladesh.

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Ms. Nicole Griffin, Environmental and Energy Manager, U.S. Marine Corps Forces, Pacific



Ms. Griffin attended the University of Hawaii at Manoa (UH) and the University of Illinois at Chicago (UIC). She received her Bachelor's Degree in Geological Sciences from UIC in 1991. Ms. Griffin was then employed as contaminant hydrogeologist for a year in Chicago, Illinois, before relocating back to Honolulu, Hawaii. The early part of her career was spent on developing her expertise in island hydrogeology (assessment and remediation of basal and perched aquifers and related human health and ecological risk assessment of watersheds/related surface water bodies). She also completed environmental compliance and due diligence projects under numerous environmental protection laws. Later, Ms. Griffin advanced her capabilities in National Environmental Policy Act (NEPA) Environmental Assessments (EAs) and Environmental Impact Statements (EISs) for terrestrial, nearshore and pelagic environments, with multiple and competing uses. After being promoted to senior management in consulting, Ms. Griffin expanded her environmental management capabilities working for the Environmental Compliance Branch of Pacific Air Forces (PACAF). She was charged with ensuring that the bases in PACAF were able to meet their legal and host nation agreement environmental responsibilities in a constrained financial environment. In 2010, Ms. Griffin became the Environmental and Energy Manager for Marine Forces of the Pacific (MARFORPAC). For the first two years, Ms. Griffin had programmatic and financial responsibilities for the environmental and energy/utilities programs of MARFORPACs 11 bases. After the stand-up of the Marine Corps Installation Command (MCICOM) in 2012, Ms. Griffin transitioned her installation responsibilities to MCICOM, and continues to work on improving environmental compliance and energy conservation for the Marine Forces.

Ms. Griffin has been married for 22 years and has three children.

Ms. Chamina Priyankari Alexander, Programme Officer, South Asia Co-operative Environment Programme



Ms. Alexander is a Programme Officer with the South Asia Co-operative Environment Programme. She has worked with SACEP since 2007. Some of her duties include identifying, formulating, implementing, monitoring and evaluating projects on environmental assessment, waste management, air pollution, wetland management and protection, and multilateral environmental agreements. Ms. Alexander regularly coordinates and provides direction to various International Organizations, such as United Nations Environment Programme (UNEP), United Nations Centre for Regional Development (UNCRD), other international organizations, and all the National Governments of South Asia in implementing a myriad of programs. Some of the programs include Declaration of Control and Prevention of Air Pollution and its likely Transboundary Effects for South Asia, 3-R Approach to Waste Management, E- Waste Management Programmes, Environmentally Sustainable Transport (EST) Forum, Climate Change, South Asia Wildlife Trade

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Initiative, and International Partnership for Expanding Waste Management Services of Local Authorizes.

Prior to working at SACEP, Ms. Alexander worked with the Urban Development Authority of Sri Lanka from 1999-2006 and the Resource Organization & Management International (Pvt) Ltd.

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RESOURCE PROTECTION

Brigadier General Ahmed Shahid, Director General, Department of International Defence Cooperation and Policy, Ministry of Defence and National Security, Republic of Maldives



Brigadier General Ahmed Shahid is the Director General of Department of International Defence Cooperation and Policy, at Ministry of Defence and National Security. General Shahid joined the Maldives National Defence Force (MNDF) in 1984 and is a graduate of the Royal Military Academy at Sandhurst, UK.

Prior to his current appointment, General Shahid has held numerous key Command as well as Staff appointments. His assignments include the Director General of intelligence, Commandant of MNDF Marine Corps, Commandant of MNDF Coast Guard, Commander of the MNDF's Male', Central and Southern Area Commands, Commanding Officer (CO) of Special Assessment Unit, CO of Regional Headquarters Hulhule', CO of Support Battalion II, CO of Electrical and Mechanical Engineers. He also served extended tours as the Executive Officer, Principal Staff Officer to the Minister of Defence and National Security at the Ministry of Defence and National Security, and is a member of various Senior Boards and Committees of MNDF.

BG Shahid holds a Masters of Arts Degree in Strategic Security Studies from College of International Security Affairs, National Defense University (USA) and is an alumnus of International Intelligence Fellows Program at National Intelligence University, (USA), and Defense Institute of International Legal Studies (USA). Other trainings completed include Infantry Officers Advance Course at Infantry Training School, Ft. Benning, (USA), Command and Staff College, Quetta (Pakistan). In addition to above, he is a Fellow of the Executive Course at Asia Pacific Centre for Security Studies (APCSS), Hawaii, (USA) and the Executive Seminar at Near East South Asia Centre (NESA) for Strategic Studies, Washington DC (USA). He has also participated in numerous regional and international seminars and conferences on policy and security matters.

During the course of his over 30 years of service, General Shahid has been awarded the Presidential Medal, 3rd November Medal, Good Conduct Medal, Distinguished Service Medal, Centenary Medal, Ribbon for Bravery, MNDF Service Ribbon, Dedicated Service Ribbon, Good Conduct Ribbon and Achievement Ribbon.

Brigadier General Ahmed Shahid is married to Mrs. Fathimath Shihama and they have a son, Ali.

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Mr. Keyvan Izadi, PES & REDD+ Advisor, SNV Netherlands Development Organisation – Bhutan



Keyvan is SNV-Bhutan's PES & REDD+ Advisor. He has extensive project management experience in conservation, international development, livelihoods, Payment for Environmental Services (PES), Reducing Emissions from Deforestation and forest Degradation (REDD+) and land use projects. He has worked at the project, sub-national, national and international levels to tailor solutions that address local needs and global objectives. His areas of expertise include project design, financing, implementation and management.

He has a Master's in Urban & Regional Planning with concentrations in International Development and Environmental Policy.

Dr. Nalin Wikramanayake, Senior Lecturer, Open University, Sri Lanka



Dr. Nalin Wikramanayake is a Senior Lecturer in the Department of Civil Engineering at the Open University of Sri Lanka since 1999. Previously he was a Senior Research Engineer, Lanka Hydraulic Institute and a Senior Lecturer in the Department of Civil Engineering at the University of Peradeniya.

He completed the degree of Bachelor of Science (Engineering) at the University of Peradeniya in 1985 and the degrees of Master of Science and Doctor of Philosophy in Civil Engineering at the Massachusetts Institute of Technology in 1989 and 1993.

Dr. Wikramanayake's research interests include coastal hydrodynamics and sediment transport, coastal and marine pollution, climate change, extreme rainfalls and floods, appropriate treatment of domestic wastewater and coastal zone and environmental management. He has engaged in consultancies related to the design and environmental impact assessment of ports, harbours and marine terminals, the development of the Coastal Zone Management Plan and the National Oil Spill Contingency Plan of Sri Lanka and the evaluation of the environmental management of post-tsunami reconstruction.

Dr. Wikramanayake has been active in regional and international such as the Land-Ocean Interactions in the Coastal Zone (LOICZ) project of the International Geosphere-Biosphere Project (IGBP) and the Global Ocean Observing System (GOOS) of the Intergovernmental Oceanographic Commission (IOC). He was a member of the Scientific Steering Committee of LOICZ from 2004 to 2006 and was the Coordinator of the LOICZ Regional Node for South Asia from 2005 to 2009.

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Mr. Ibrahim Naeem, Director, SAARC Coastal Zone Management Centre



Mr. Ibrahim Naeem is currently the Director General of the Maldives Environmental Protection Agency and the Director of the South Asian Association for Regional Cooperation (SAARC) Coastal Zone Management Centre. He has extensive experience and knowledge on fisheries, reefs and coastal zone management in the Maldives. Some of his work experience includes Fish Aggregating Device deployment and monitoring, aquarium fisheries, tuna tagging, fish cataloguing, coral reef monitoring and restoration, and coastal zone management. He has a Masters of Environmental

Management from the University of Queensland (Australia) and a Bachelor of Science in Aquatic Sciences from Burapha University (Thailand). He has attended numerous professional training courses abroad, and has published on Maldivian fisheries, fish, and coral bleaching.

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ENERGY

Brigadier General Mark M. McLeod, Director for Logistics, Engineering, and Security Assistance, J4, U.S. Pacific Command



Brig. Gen. Mark M. McLeod is the Director for Logistics, Engineering and Security Assistance, Headquarters U.S. Pacific Command, Camp H.M. Smith, Hawaii. He is responsible for the planning, coordination, and integration of strategic Logistics, Engineering and Security Cooperation in support of U.S. National Defense Strategy in order to build U.S. and partner capacities to accomplish the USPACOM mission across the Asia-Pacific theater.

General McLeod entered the Air Force in 1986 after completing Officer Training School, Lackland AFB, Texas. In addition to his various wing maintenance positions, he has managed Programmed Depot Repair operations, performed C-5 Weapon System Manager duties, served as Maintenance Liaison to the Republic of Korea Air Force, oversaw U.S. Central Command strategic sea-/airlift transportation movements, commanded two Expeditionary Maintenance Groups, and performed logistics, installation and mission support planning and programming at Headquarters Air Force.

Prior to his current position, the general was the Director of Logistics, Headquarters Pacific Air Forces, Joint Base Pearl Harbor-Hickam, Hawaii, responsible for the maintenance and support of tactical fighter, reconnaissance and support aircraft; supplies and equipment; general- and special-purpose vehicles; storage and maintenance of war reserve materiel, and conventional munitions. He also served as the Director of Logistics for Joint Task Force 519, responsible for campaign logistics support for all military forces assigned to the task force.

Commander (Retired) Neil Gadihoke, Research Fellow, Society for Policy Studies



Commander Neil Gadihoke hung his uniform on 31 Dec 2011 after completing 21 years of service in the Indian Navy. He is an alumnus of the National Defence Academy which he joined as a cadet in 1986.

Neil was commissioned into the Executive branch of the Navy in 1990 and specialized in Communications and Electronic warfare and has served onboard many frontline warships, spending many years at sea, undergoing rigor and excitement of a military life.

He holds MSc (Telecommunications), MSc (Defence and Security Studies) and MBA degrees and has been an instructor at Navy's training intuitions.

Neil was selected to undergo the year long Staff Course at US Navy Staff College, Rhode Island, USA during the academic year 2004-2005, where he was awarded the Zimmerman Gray Writing Award for the best research paper by an International Student.

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Subsequently, at Naval HQ, New Delhi, he was awarded the Chief of Naval Staff Commendation whilst at the Directorate of Strategy, Concepts and Transformation, where he was a member of the core team that drafted the Indian Navy's Maritime Strategy. He has also served as the Naval Assistant to the C-in-C of Strategic Forces and as a Joint Director of Naval Telecommunications.

Neil underwent a two year research fellowship (2009 – 2011) on Alternative Energy scenario and Implications of Climate Change including melting of the Arctic, at Navy's think tank, the National Maritime Foundation (NMF) and has published articles in various journals and websites. On these topics, including the role of Navies in military environmental management, he has been the speaker at many conferences in India and at Washington DC, Singapore and Colombo.

His area of interest also includes associated geo-politics, risk management, maritime security and defence issues. He was part of a global team constituted by ESI (Energy Studies Institute) Singapore, to draft their book on Implications of the Arctic Melting.

Neil presently wears a double hat: being a research fellow with the Society for Policy Studies and also a Risk and Disaster Management lead in the corporate sector, dealing daily with various aspects of risk mitigation.

He was born on 31 Jul 1969, eleven days after Neil Armstrong's historic landing on the moon, hence named after the legend. An international traveler, having visited more than 25 countries, Neil is an avid piano player and resides with his family in New Delhi.

Dr. Sandip Shah, Vice President & Country Director, SN Power Holding Singapore Pte. Ltd.



Dr. Sandip Shah is an experienced hydropower engineer and independent power producer of Nepal.

After completing his Ph.D. in Civil Engineering from Canada in 1992, Dr. Shah has worked as a consultant for the investigation, design and construction of hydropower projects in Nepal, including the Kali Gandaki "A" (144MW), Upper Bhote Koshi (45MW), Khimti (60MW), Middle Marsyangdi (70MW), Likhu-IV (51MW), Trishuli-Devighat Hydropower Upgrading Project (45MW), Indrawati-III (5MW), etc.

Currently he is Vice President and Country Director for SN Power in Nepal, and is working on the development of Tamakoshi-3 (650 MW) HEP as Project Director and expansion of the Khimti Project, termed Kirne Power Project (67 MW). He is also responsible for the 400 kV transmission line for evacuation of power from Tamakoshi Valley to India. As Chief Engineer – Civil – for SN Power, he is responsible for projects and construction aspects of its greenfield projects globally. He is currently a member of the Board of Directors of Himal Power Ltd., which owns and operates the 60MW Khimti I Power Plant. Prior to this assignment, he was General Manager of the Bhote Koshi Power Company, which owns and operates the 45MW Upper Bhote Koshi hydropower plant in Nepal representing Panda Energy International, Inc. of USA.

As President of the Independent Power Producers' Association, Nepal (IPPAN) since January 2001 till September 2010, Dr. Shah has contributed considerably to formulation of power sector policies,

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acts, regulations and has participated in various national and international forums for power sector reforms, introduction of legal and regulatory framework, transmission interconnections, development of electricity markets, optimization of hydropower plants for maximum water resource utilization with minimum environmental impacts, carbon emission trading, etc. He has been a strong advocate of private investments in the hydropower sector in Nepal and for promotion of project finance and energy markets. He has been instrumental in advocating for establishment of cross-border transmission lines to India and for formalizing a Power Trade Agreement with India for access to the electricity market in India. As IPPAN President, he was key to organizing the Power Summits 2006, 2007, 2008 and Hydropower Conventions 2009 and 2011 to attract foreign investment in Nepal's hydropower sector. Since 2001, he has participated actively in USAID's SARI/E and SAREC programs for regional cooperation for electricity markets and energy security.

Dr. Arunabha Ghosh, Chief Executive Officer, Council on Energy, Environment, and Water



Dr. Arunabha Ghosh is CEO of the Council on Energy, Environment and Water (CEEW), an independent policy think-tank. Having conceptualised CEEW, Arunabha led it in less than three years to the number 1 ranking among climate-related think-tanks in India and 15th globally. In January 2014 CEEW was ranked first in India across three categories in the Global Go To Think Tank Index. He is a World Economic Forum Young Global Leader, Asia Society Asia 21 Young Leader, and a fellow of the Aspen Global Leadership Network.

With experience in more than thirty countries and having worked at Princeton, Oxford, UNDP and WTO, Arunabha advises governments, industry and civil society around the world on: energy and resources security; renewable energy; water governance and institutions; climate governance (financing, technology, HFCs, geoengineering); energy-trade-climate linkages; and international regime design. His latest initiative is called the Clean Energy Access Network, a countrywide alliance of decentralised energy firms in India. Dr Ghosh has presented to heads of state, India's Parliament, the European Parliament, Brazil's Senate, the Andhra Pradesh Legislative Assembly and other legislatures; trained ministers in Central Asia; and hosted a documentary on water set out of Africa. His op-eds have appeared in numerous periodicals and he has commented on radio and television across the world.

Among numerous publications, Arunabha wrote the first report on India and global governance, led teams for India's National Water Resources Framework Study, the first evaluation of India's National Solar Mission, and on strategic industries for India for the National Security Advisory Board (Prime Minister's Office), and co-authored three UNDP Human Development Reports. He has written on the energy-food-water-climate nexus for the NSAB as well, the governance of climate engineering technologies for the Intergovernmental Panel on Climate Change, clean energy subsidies for the Rio+20 Summit, and on business models for off-grid energy, energy storage technologies, and hydrofluorocarbons. His most recent publications include reports on urban water and sanitation in India, and on renewable energy applications beyond electricity.

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Arunabha is associated with Oxford's Global Economic Governance Programme, its Smith School of Enterprise and the Environment, and sits on the Board of the International Centre for Trade and Sustainable Development, Geneva. Arunabha holds a doctorate from Oxford, and topped Economics from St. Stephen's College, Delhi University.

Ms. Jane Holloway, Senior Systems Scientist, Australian Department of Defence



Jane Holloway is a senior systems scientist in the Joint and Operations Analysis Division of the Australian Defence Science & Technology Organisation (DSTO). Jane is the lead science researcher for the Vice Chief of the Defence Force Group's study of global changes in strategic military geography: preparedness impacts. Jane, and colleague Cheryl Durrant of VCDF Group, presented early findings of this study at the Pacific Environmental Security Forum 2013 in Sydney.

Prior to this activity, Jane was a senior analyst of emerging technologies with potential military application. Before joining DSTO, Jane worked as a scientist in the Land Use Management and Change Program of the Australian Bureau of Rural Sciences. From 1999-2003 she was a trade analyst and then program manager in trade and new technologies for Australian wool industry research bodies The Woolmark Company and Australian Wool Innovation.

Jane has also worked in agricultural and veterinary chemicals policy, including dual-use chemicals and precursors and environmental pollutants. Before that, she was a scientist and policy analyst with the Australian Department of Foreign Affairs and Trade providing scientific support on agriculture and environment-related trade disputes, and developing policies on trade and environment, and trade and development within the World Trade Organisation system.

Jane holds a Bachelor of Applied Science (Honours) in Systems Agriculture from the University of Western Sydney – Hawkesbury (formerly Hawkesbury Agricultural College).

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CLOSING CEREMONY

Honorable Michele J. Sison, U.S. Ambassador to Sri Lanka and the Maldives



Michele J. Sison has served as the U.S. Ambassador to Sri Lanka and Maldives since 2012. Ambassador Sison previously served as Assistant Chief of Mission in Baghdad, Iraq (2011-2012), U.S. Ambassador to Lebanon (2008-2010), and U.S. Ambassador to the United Arab Emirates (2004-2008). She holds the rank of Career Minister in the U.S. Foreign Service.

Sison's earlier assignments include service as Principal Deputy Assistant Secretary of State for South Asian Affairs (2002-2004); Deputy Chief of Mission in Islamabad, Pakistan (1999-2002); Consul General/Principal Officer in Chennai, India (1996-1999); and tours in Côte d'Ivoire, Cameroon, Benin, Togo, and Haiti. Sison also served as the State Department's Director of Career Development and Assignments (2010-2011).

Ambassador Sison is the recipient of the U.S. Presidential Distinguished Service Award, U. S. Presidential Meritorious Service Award, and the U.S. Department of the Army's Outstanding Civilian Service Medal. She also holds numerous U.S. Department of State awards, including Superior Honor Awards and Ambassadorial-level awards for counter-proliferation efforts (2008) and anti-trafficking in persons work (2005).

Ambassador Sison received her B.A. in Political Science from Wellesley College and also studied at the London School of Economics. She joined the U.S. Foreign Service in 1982. Ambassador Sison is an active member of the Women in Public Service Project and has lectured at the Women in Public Service Project Summer Institute. She is the mother of two grown daughters.

Honorable Thoriq Ibrahim, Ministry of Environment and Energy, Republic of Maldives



Mr. Thoriq has more than 17 years of experience in the field of building services, engineering design, supervision & project management of construction projects, and M&E building maintenance services.

Being the first Graduate Building Services Engineer in the Maldives, Thoriq has been involved in designing the Building Services Systems for most of the public buildings, private buildings, and tourist resorts in the Maldives during the last 17 years.

After completing a Masters in Building Science Course at National University of Singapore (NUS) on Nov 2001, he joined a Singapore based international multi-disciplinary consultancy company called Black & Veatch (SEA) Ltd. He was attached as an M&E design engineer. Thoriq also gained experience on site by working as an assistant resident M&E Engineer for the upgrading of Chestnut Avenue Water Works, Singapore.

Thoriq returned to work in the Maldives on July 04. Some of the major design work he has under taken since returning to Maldives was the design of M&E services for the Dusit Thani

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Maldives at B. Muhdhoo, Maamigili Airport, W Maldives Resort at Fesdhu, Proposed Regent Resort in the Maldives, Proposed Renaissance Maldives, Proposed JW Marriott Maldives, and Proposed Bvlgari Resort. Thoriq was also the Project Director representing Maldivian Government during the reconstruction of Houses in nine islands that were destroyed during the tsunami that hit Maldives in Dec 04.

Thoriq left Civil Services on November 2008, and now works at Gedor Consulting Pte. Ltd on a full time basis as a Director in charge of all Building Services related design consultancy and supervision works. Thoriq initiated the M&E Building Maintenance Section at Gedor in 1998, which was the first routine M&E maintenance services setup in the Maldives. Today, Gedor Building Maintenance Services is one of the largest setups in Male' that provides 24 hours M&E services.

Thoriq is currently the Minister of Environment and Energy for the Republic of Maldives.

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SOUTH ASIA
REGIONAL
ENVIRONMENTAL
SECURITY FORUM

PRESENTATION SUMMARIES



Co-Sponsored by: | Maldives National Defence Force and
the U.S. Pacific Command

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South Asia Regional Environmental Security Forum

Presentation Summaries



- Day 1: Water Security -

0945 - 1015 **Water: A Potential Trigger for Conflicts?**

Dr. Herath Manthrithilake, Head, Sri Lanka Development Initiative, International Water Management Institute

The South Asian region currently has one of the largest population concentrations and is also one of the fastest growing regions in the world. Increasing population, urbanization, economic growth, and climate change will result in countries exhausting surface water, groundwater, and trans-boundary water resources in the near future. While the water supplies are diminishing, demand and pollution continue to increase leading to social unrest. Economic hubs like Mumbai, Dhaka, and Karachi are creating not only physical but also economic water scarcities. For many years, feeding the population was top priority for governments and this is not becoming easier. Cities are expanding rapidly. Nations, businesses and communities face substantial challenges in delivering services. This, in part due to greater climate variability and the complexities of climate change impacts in different locations. Apart from exhausting internal resources, demand for trans-boundary resources will increase. Countries like Pakistan, India, and Bangladesh will demand more when sharing water from common sources. Receding glaciers in the Himalayas will only exacerbate this crisis. Though Sri Lanka and Maldives are free from trans-boundary quantity issues; there is nothing preventing the rise of trans-boundary quality issues in the future. Therefore, South Asia must engage its citizens, sharing relevant risk information and presenting it in a way that communities can understand while promoting robust methodologies to mitigate risks to suit different needs. Unless appropriate actions are taken now, countries will face both internal civil unrests and external cross-border conflicts in the future.

1045 - 1115 **Grounding the Water Security Debate: Balancing 'Eagle-Eye' and 'Toad-Eye' Sciences for Semi-Arid South Asia**

Mr. Dipak Gyawali, Minister (Former), Ministry of Water Resources, Nepal

Before one can intelligibly address the question of water security, some deconstruction of the notion would be in order, starting with the questions: "Whose security?"; "At what level?"; "Who decides?"; "Who objects and why?"; and so on. One also needs to distance oneself from orthodox fads and politically correct approaches. For example, climate change (disastrously serious in the long-term though it may be with increased intensities and frequencies of floods and droughts) cannot continue to be used by development agencies as an excuse for not adequately addressing (or budgeting for) current levels of water woes. Also, trans-boundary water conflicts, important though they are, pale into insignificance in many countries when compared with internal water conflicts and management deficiencies. Moreover, the inordinate amount of attention given to 'blue' water has meant a management blind spot regarding 'green' and 'grey' waters, as well as the source of them all, the freshwater that comes down as precipitation. The concept of water security is intrinsically tied with the concept of risk, which in turn is largely socially constructed. Descriptive physical and social sciences may successfully portray the lay of the terrain on this count, but when it comes to policy responses, one has to fall back on the interpretive social sciences. This essay will use the Theory of Plural Rationalities (Cultural Theory) to explore the plural construction of risk by different social solidarities as they make their contending responses to technology and policy choices to enhance their water security as they perceive it.

South Asia Regional Environmental Security Forum

Presentation Summaries



1115 - 1145 **Maldivian Water Security Concerns**

Mr. Mohamed Rasheed, Head of Operations, Male Water & Sewerage Company, Republic of Maldives

Life has been going on business as usual in the Maldives for over 2000 years. All along issues related with water was our primary concern. When strategies to attain the objective failed, it simply erased off a chunk of the population and very often entire islands. However, Maldivians have been resilient.

The thin water lens was subjected to pollution through ignorance and poor sanitation systems, as well as through salt water intrusion. Water related disease and epidemics were highest on the Government Agenda in the 1970's through 1990's. Water was then a national concern due to the ill health it caused.

Today, in 2014, concern for water security remains topmost on the Agenda. We also realize that depending on rainfall alone is not sufficient. Everyone today realizes that 'Water is Life', and without good quality water life itself is threatened. New sources and new thinking is required. Maintaining Quality of Life is only possible only when all threats to water security are mitigated.

New strategic alignments and actions are being taken earnestly. We believe that MWSC is leading the way forward in the Maldives.

<u>Concern</u>	<u>Reason</u>
• Lack of Safe Water and Inadequate Sanitation facilities	• Death, Disease and Poor Health
• Rapid Urbanization of Male' since the 1970's	• Continuous struggle to meet the water demand
• Poorly Managed ground water	• Over exploitation
• Rapid increase in production cost and decline in revenues	• Continuous increase in fuel prices
• Global Warming and rapid changes in weather patterns	• Shift in monsoon patterns and drought • More intense and shorter duration rainfall events, causing floods/damage
• Natural Disasters	• Effects on agricultural crops and death of long standing seasonal trees
• 2004 Tsunami and more frequent droughts and flooding incidents	• Shortage of drinking water and need to transfer to affected islands
• Need to act beyond MWSC's capacity	• In supplying safe water to the affected • Own resources required for investing on outer island infrastructure • In providing training
• No Land to develop infrastructure • Cost may become unaffordable to customers • Adverse effect on MWSC's Revenues	• Only option is to go offshore; to introduce new technologies even at prohibitive costs

South Asia Regional Environmental Security Forum

Presentation Summaries



-Day 2: Waste Management-

0915 – 0945 **Post-Disaster Debris Clearance: Rana Plaza Building Collapse**

Brig Gen Ibne Fazal Shayekhuzzaman, Director, National Telecommunication Monitoring Centre, Ministry of Home Affairs, Bangladesh

1. On 24th April 2013, Rana Plaza, a nine story building collapsed in Savar, a sub-district located 30 kilometer west of Dhaka, the capital of Bangladesh. The incident left 1132 dead and 2421 injured survivors as the immediate victims of the disaster.
2. It is considered to be the deadliest garment factory accident in history, as well as the deadliest accidental structural failure in modern human history. In the known history of the building collapse, Rana Plaza stands as second after Twin Tower in terms of human casualty.
3. Following the event, the government, military, local leadership and people from all walks of life were instantly involved to fight back the disaster. The need for layered and mutually supporting capabilities to create an effective and unified national response was felt and materialized.
4. The decision of disaster management was instantly taken where an instant agreement with other jurisdictions and agencies was done for the provision of debris management. Rana Plaza satisfied eligible debris removal criteria. The waste was mostly a combination of construction and demolition debris mixed with putrescent debris. Human remains embedded within the debris further complicated the removal. However, FEMA standard was followed for debris clearance process.
5. The government formed a coordinating body encompassing the representatives from concern agencies with the local military commander as the Chief Coordinator. The coordinating body provided the 'Debris Management Planning Concept'. Thereafter the mobilization of engineering assets and conduct of debris removal operations were done by the Engineering Task Force formed with the military engineering units.
6. Ministry of Food and Disaster Management was the core ministry and military worked as the lead agency for the disaster management and debris removal operations. Standing Order for Disaster 2010 (SOD 2010) was the core booklet followed. The operation continued for 21 days leaving behind many lessons to follow in future disasters.

0945 – 1015 **Regional Approaches to Solid Waste Management in South Asia**

Ms. Chamina Priyankari Alexander, Programme Officer, South Asia Co-operative Environment Programme

In Countries of South Asia, rapid population, industrialization, urbanization and growth of economy contribute to increasing solid waste generation. This has led to significant environmental and health issues such as pollution of soil, surface, groundwater and emission of Green House gasses.

The Municipal Solid Waste in South Asian nations are largely managed by their municipalities. Although considerable efforts have been made by many Governments and other entities in tackling waste-related problems, there are still major gaps to be filled in this area. In developing countries, it is common for municipalities to spend 20-50 percent of their available budget on solid waste management, even though 30-60 percent of all the urban solid wastes remain uncollected and less than 50 percent of the population is served.

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Taking effective measures in solid waste management will eliminate adverse impacts on the environment and human health and will support economic development and improve quality of life. Further it will reduce the burden that waste imposes on national budgets. Therefore understanding the importance of proper Integrated Solid waste Management is something to be considered by all the nations in minimizing further environmental contamination.

Recognizing this fast emerging issue, the Governing Council of SACEP at its 9th session mandated SACEP to focus on Waste Management as one of the priority areas in its work programme. SACEP also acts as the Sub Regional Secretariat for South Asia in the International Partnership for Expanding Waste Management Services of Local Authorities (IPLA) a programme initiated by UNCRD. The presentation will further highlight SACEP's role in Solid Waste Management in South Asia and will provide a comprehensive picture of the Prevailing scenario of waste handling practices and management within each South Asian Nation. It will also provide Valuable case studies as a means of sharing the best experiences on sustainable waste management in the region.

1015 – 1045 Desktop Demonstration of a Waste Management Unit in an Island Environment

Ms. Nicole Griffin, Environmental and Energy Manager, U.S. Marine Corps Forces, Pacific

Waste management in an island environment is difficult due to lack of available land, sensitive water resources and long transportation distances to alternate disposal sites. Developing solutions that reduce waste volume and exposure to contaminants is important. In an effort to provide more effective waste management and possibly provide energy for forces during contingency operations, U.S. Marine Forces Pacific has been evaluating waste to energy systems including portable gasifiers. Although these systems are valuable in improving waste management, care must still be taken to properly site and operate the system as well as dispose of the effluents. The desktop demonstration takes potential users through the siting, operation, waste disposal and close-out of operation of a waste management system in an island environment.

South Asia Regional Environmental Security Forum

Presentation Summaries



-Day 3: Resource Protection-

0915 - 0945 Payment for Environmental Service: A Tool to Achieve Poverty Reduction & Environmental Security

Mr. Keyvan Izadi, PES & REDD+ Advisor, SNV Netherlands Development Organisation – Bhutan

A powerful tool to address poverty reduction and environmental security, Payment for Environmental Services (PES) is a market-based “pay-for-performance” approach to financing conservation and sustainable community development whereby environmental service (ES) providers receive payments from ES users/buyers that are conditional on specific conservation performance. The payments are designed to offset the opportunity cost of conservation for the ES providers. The PES capacity building process and the agreement help develop trust, reliance and an egalitarian relationship between ES providers and buyers as equal partners to shared local/regional solutions. The revenue to the ES providers is typically directed into their representative local institution for the financing and delivery of community benefits. Current PES projects typically focus on water, carbon, biodiversity and landscape beauty.

Additionally, PES helps in generating an understanding of the relationship between ecosystem services and human well-being and engages communities in direct conservation activities that address local needs and global environmental sustainability objectives. It is a particularly effective tool in the developing world where the regulatory and enforcement environment is frequently constrained by weak institutions with poor governance and accountability. PES builds capacity in local institutions, strengthens governance and provides regional and national decision makers with replicable successes to serve as models for broad based application across multiple sectors.

0945 - 1015 Globalization, Marine Pollution and Regional Environmental Security

Dr. Nalin Wikramanayake, Senior Lecturer, Open University, Sri Lanka

The presentation begins with an overview of marine pollution and its occurrence at global, regional and country scales. The increase in levels of carbon dioxide and mercury in the atmosphere, pollution due to shipping, oil spills, the ship breaking industry and pollution from land-based sources are considered as examples of regional significance.

These examples are used to highlight the relationship between the increased international integration of economic activities and regional marine pollution. The impact of integration is to concentrate the sources of pollution into particular countries and regions. Understanding this linkage is needed to anticipate trends and control the problem.

Marine pollution is related to regional environmental security through the goods and services provided by the marine environment. The current and future impacts of the examples considered on livelihoods and economic activities in the region are discussed and need for increased monitoring and sharing of knowledge is highlighted.

The international, regional and country measures taken to control, reduce and monitor marine pollution are described, with particular reference to the Marpol convention and the South Asian Seas Program. Greater regional cooperation is needed to strengthen these measures. The use of public awareness to influence the generators of pollution and improve the implementation of existing controls is proposed as another method to address the problem. These methods include the concepts of ethical consumption and life cycle analysis.

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The presentation concludes with a summary and the message that all the audience have the responsibility of reducing marine pollution by reducing the generation of waste, the responsible discharge of waste, helping to monitor the marine environment, increasing regional cooperation and increasing awareness among decision makers and the public.

1015 – 1045 Coastal Zone Issues and Challenges in the Maldives

Mr. Ibrahim Naeem, Director, SAARC Coastal Zone Management Centre

The presentation consists of a short overview of basic information of the Maldives with diagrammatic representations showing the geographical location, arrangement of islands within the Atolls. The vulnerability indicators such as the low level land areas above sea level identified making the islands of Maldives vulnerable to Coastal related issues; erosion and the number of inhabited islands facing perennial beach erosion is about 64 %. Large seasonal adjustments in beach positions and the relation to shape of the islands to these adjustments had been observed by the Research done, in which eight islands were used as models over a period of eight years to study the relationship between the seasonal adjustments of the beach and the monsoons of the Maldives (The UNESCO biosphere reserve). Furthermore, a relationship between the shapes of the islands formed and their locations have been identified.

The major coastal issue of the Maldives is erosion and the causes of it both natural and man-made have been identified such as increasing wave energy at shoreline, reduction of sediment supply generated on reef, interruption or removal of sediment from the littoral transport budget and increase in sediment transport out of island sediment budget. The effects on the beach by Coastal Protection Hard engineering structures such as groin, seawall, harbor walls and breakwaters on the sea currents around the islands have been observed by a research “Coastal Monitoring Reef Island Shoreline Dynamics and Management Implications” (by Paul Kench 2010). Soft engineering such as beach nourishments, zoning and relocation of assets are some temporary measures taken. Insufficient data, resources (survey equipment) and limited technical and financial capacity to conduct regular monitoring and survey have been identified as challenges in the Coastal management Field.

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-Day 4: Energy-

0915 - 0940 **Energy Implications for India's Maritime Domain**

Commander (Retired) Neil Gadihoke, Research Fellow, Society for Policy Studies

Owing to rapid economic growth, India has one of the world's fastest growing energy markets and is expected to be the second-largest contributor to the increase in global energy demand by 2035. Presently, most of India's energy requirements are being met through imported fossil fuels and indigenous coal reserves.

Nonetheless, India remains power deficit, especially the southern part of the country, which is peninsular in shape and washed by a coastline of over 7500 kilometres. Given India's limitations of conventional (non-renewable) sources of energy, the Government, through the Ministry for New and Renewable energy is focused on development of offshore wind energy, especially in the coastal states of Andhra Pradesh, Gujarat, Maharashtra, Karnataka, and Tamil Nadu. Though the potential is exciting, the progress has been slow.

Further, since India is surrounded by sea on three sides, its potential to harness tidal energy is immense. The most attractive locations are the Gulf of Cambay and the Gulf of Kachchh on the west coast, and the Ganges Delta in West Bengal on the east coast.

These two domains of renewable energy, both of which are maritime based, have the potential to contribute substantially to the energy basket.

On another plane, the carbon emissions from shipping have hitherto figured low on the Environmental Security debate, which may have to do with an imbalance of public perception, which traditionally has tended to focus on land transport and aviation. The same is applicable to the Indian shipping industry as well, including lack of awareness of warship emissions. Given future emission projections, the shipping sector is likely to face increasing demands to address the issue of their green house gas (GHG) emissions.

Since India is at the energy intensive phase of its growth, all issues touched upon above have implications for the regional Environmental Security, since India is by far South Asia's largest consumer of energy, as well as its biggest polluter.

The presentation will explore Energy Implications of India's Maritime Domain, which will encompass issues, some of which have been highlighted above.

0940 - 1000 **Electricity Supply Security through Regional Cooperation in South Asia**

Dr. Sandip Shah, Vice President & Country Director, SN Power Holding Singapore Pte. Ltd.

South Asian countries are rapidly growing economies with large populations and require electricity supply to fuel their growth engines and to improve the living standards of their people. The average per capita consumption of electricity in the region is only about 500 kWh per year. However, demand for electricity is increasing rapidly and has outstripped the supply possibility in the near and far terms.

At present, all countries of the region are facing major deficit in electricity supply. There are seasonal imbalances in supply and demand of electricity. Some countries have had to resort to long hours of rolling blackouts to manage the electricity supply systems. Others have resorted to expensive diesel generation to meet peak-time shortages. Moreover, state electricity utilities are facing major

South Asia Regional Environmental Security Forum

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financial difficulties due to which capacity addition, transmission and distribution strengthening and reduction of technical and non-technical losses have been affected. All countries are undergoing power sector reforms in a gradual manner and have achieved various degrees of success. The need for privatization of generation, transmission and distribution with a transparent regulatory regime is changing electricity market dynamics.

Electricity is generated in the countries of the region through different sources – coal, oil, gas, nuclear, hydro, wind, solar, biomass and other renewables. These resources are concentrated in certain areas in different countries. In order to achieve a balanced electricity supply system with affordable cost of electricity, it is essential to have a good generation mix from various electricity supply sources. The cost of unserved energy, climate change, safety in production are some of the challenges which are impacting the way the electricity supply industry will grow.

Due to the inherent nature of the electricity supply resources, it is becoming increasingly apparent that regional cooperation for electricity supply security is a must. The requirements for such a system to evolve are power trade agreements, establishment of regional grids, regional transmission grids, open access on transmission lines, cross-border electricity regulatory framework, deregulated market, and most importantly political will among the countries of the region.

1000 - 1025 Promoting De-Centralised Renewable Energy

Dr. Arunabha Ghosh, Chief Executive Officer, Council on Energy, Environment, and Water

India is the world's fifth largest electricity producer, but 45% of rural households do not have access to electricity. Energy access in rural areas offers opportunities that go beyond minimum requirements for electricity and heat. It creates the foundation for livelihoods, investments in more value added activities, and social benefits in the form of access to education or improved health outcomes. The presentation will draw attention to more than 250 companies, which currently provide decentralised energy solutions ranging from individual products (like lanterns and cookstoves) to home systems (such as two lights, a fan and mobile charging point) to micro-grids that connect several households together. These enterprises also use several technologies, although solar has dominated so far. Solutions are delivered through a variety of business models depending on choices across several parameters, including technology, scale of intervention, investment and revenue models. The presentation will argue that investments in the off-grid energy sector depend on at least one of three necessary conditions, namely, the promise of a long-term revenue stream; reduced risks for investors; and reduced operational costs. The presentation will finally describe how a network of decentralised energy entrepreneurs can deliver common operational services (information services; technology development and testing; and skills, training and capacity building), lower their costs and give opportunities to scale operations. Similar methods can be adopted for more widespread deployment of renewable energy in the armed forces. Decentralised clean energy is increasingly being viewed not only as a developmental imperative but a strategic one as well.

1025 - 1045 The Australian Defence Energy Integration Framework

Ms. Jane Holloway, Senior Systems Scientist, Australian Department of Defence

Military missions today need lots of energy with fuel supply lines that can be costly, vulnerable to disruption and a constraint on operational maneuver. Effective energy management and integration reduces risks to future Defence capability and operations.

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Energy sustainment is a major issue for Australian Defence, and a key part of building organizational resilience to changes in military operating environments. Defence is a significant user of liquid fuels and has specific fuel requirements. A doubling of the amount of fuel needed coupled with rising fuel prices and continuing budget constraints will be a significant challenge for Australia.

The Defence Energy Integration Framework (DEIF) sets out an integrated risk management approach to ensure future energy productivity. The challenge is to use energy as a strategic advantage rather than bear it as a burden.

The aim of the DEIF is to ensure sustainable energy security for operations, now and in the future. Defence's ability to measure operational energy requirements will be improved, demand reduced, and the diversity and resilience of our energy supply increased. Key allies, like the US and UK, have diversified their operational energy demand and supply, using innovative energy solutions.

Outcomes of the DEIF process include greater situational awareness of energy risks – inside and outside Defence – and the emergence of a whole-of-Defence view of future energy issues. This led to organization-wide 'ownership' via a community of interest that is now becoming a community of action. This proved crucial in developing improvement options and getting executive endorsement for the DEIF.

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SOUTH ASIA
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SECURITY FORUM

TABLE-TOP EXERCISE



Co-Sponsored by: | Maldives National Defence Force and
the U.S. Pacific Command

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INSTRUCTIONS

The Table-Top Exercise (TTX) will take place on 04 June 2014. The discussion will start by having all participants sit in the main conference hall and listen to a presentation on the TTX process, as well as the scenario. A member of the Control Group will take the stage, and explain the instructions for the TTX, as well as present the themes, goals and objectives. The instruction and themes will be presented via Microsoft PowerPoint, and they will be shown on a large screen visible to everyone. There will be five groups. The groups are color-coded. Please look at your name tag, which has a colored tab on it. Please report to the work group table that matches your color tab.

After all work groups have been seated, the TTX will commence. Injections will be delivered by the Control Group to the work groups via the following methods.

1. The injections will be shown on a large screen in the front of each work group room.
2. The injections will be printed and hung on easel boards adjacent to each work group.
3. The injections will be printed in the event booklet, and participants can flip to the TTX section to view the information.
4. The Exercise Control Group will issue the injections on printed paper to each of the work groups.

The injections will be delivered in two phases, and each phase will run for one hour. The first phase will focus on initial response to cleaning up fuel and industrial chemicals spilled into the ocean as a result of a shipwreck. The second phase will feature injections on recovering from the shipwreck, and mitigating future incidents.

The same injections and questions will be presented to each of the five work groups. There will be approximately two injections per phase of the discussion. Each work group will have to consult amongst their members to answer the associated questions. Facilitators will be present in each work group to assist with the process and explain the details of the questions. Each work group will have approximately 30 minutes to collectively work through an injection and prepare answers to the questions posed. Responses to inject questions will be recorded by a work group member or facilitator, and it will be written on the easel paper provided. If a work group facilitator feels that his/her work group needs more time responding to an injection, then the work group will be allocated additional time. When answering an injection question, the goal is not to see how quickly each question can be answered. Rather, the goal of each injection is to spark collaborative dialog and seek common goals to solving regional maritime protection challenges.

The phases of the discussion will be broken up by one break so that participants do not become overwhelmed by the questions. Please refer to the Regional Environmental Security Forum agenda for specific details on the phases and/or breaks.

At the end of the TTX, a short After-Action Review (AAR) will be conducted by all work groups. Work groups will be given 15 minutes to prepare a summary of their responses to the injections. Facilitators for each work group will identify a spokesperson, and this spokesperson will brief the work group results to all participants. Each work group outbrief will last no more than 5-10 minutes.

SCENARIO

South Asia

Regional Environmental Security Forum

Narrative

On the open sea to the east of the Maldives, a large container vessel is tilling a path through the massive expanse of water. The ship sways in a laborious and methodical fashion, with its passengers in the doldrums of given the oppressive June heat. Routine checks are performed, and the ship's captain seems satisfied with the melancholy approach. The crew is fatigued and weathered by the length of the trip. It has been one month since the comfort of their last call. Occasionally, a glimpse of land emerges in the distance, but the mirage fades under the brilliant sun.



In the distance, two small boats are seen racing towards the ship. The boats jump rhythmically out of the water like fish surfacing for air. Whitewash surrounds the boats, indicating their determination to catch the container ship. As the speeding boats near, the captain remains unaware of their approach. The emptiness that has obscured his view the past 30 days seems to have also retarded his ability to comprehend the new threat. Suddenly, the two boats approach the container ship, and the armed men rapidly board the ship like ants climbing a fruit tree. The container ship crew is startled by the occupation, and before they can react, they are held at gunpoint. The marauders make their way to the ship's navigation deck, and take the captain and his crew hostage. They command the vessel and quarantine the crew in the berthing room, in hopes for a hefty ransom.

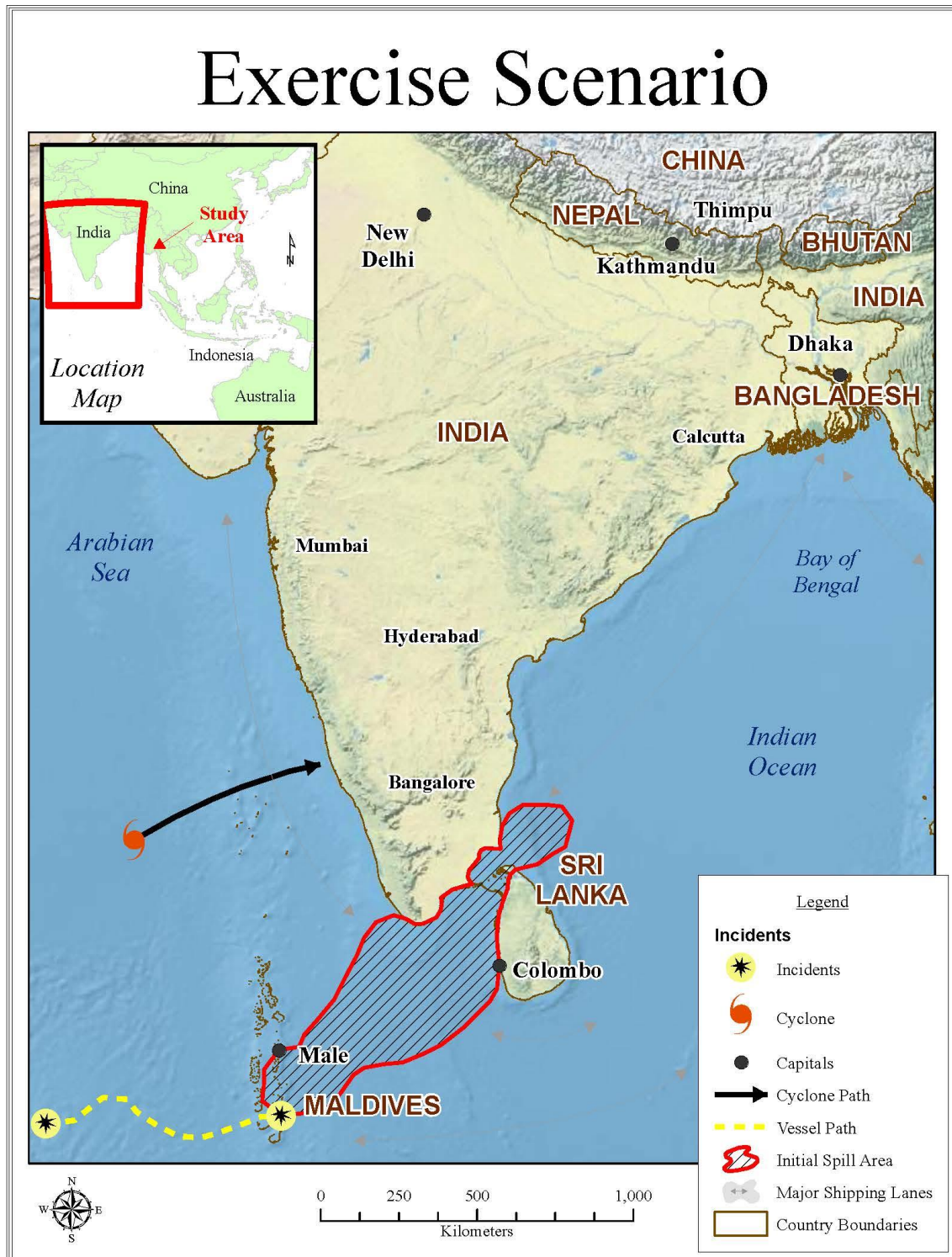


With full control of the container ship, the pirates begin to steam towards the Maldives. The unfamiliar controls leave the pirates preceding forward in a reckless manner. The ship slaps against the ocean in thunderous claps that jostle loose the cargo. Suddenly, components of the ship's payload launch into the ocean like dogs unleashed after days of confinement. Containers of industrial detergent pour overboard and deposit into the abyss. The pirates are unable to control the ship's movement, as more and more containers fall overboard. In an attempt to gain control, the pirates flail feverishly at the controls. They have now become dangerously close to a patch of isolated reef, and crash into the submerged hazard. The ship jerks to its starboard, pouring out fuel

and oil from its damaged hull. The remaining industrial containers tumble into the water. Quickly, the ship begins to take on water as pollutants cover the reef and enshroud the marine life.

In the chaos, the pirates abandon ship in a small lifeboat. The original crew remain locked in the berthing room, fatigued and injured from the accident. Eventually, the crew free themselves from confinement, evaluates the situation, and decides that the damage is too severe to manage alone. The captain orders them to a remaining lifeboat, and they abandon ship through the polluted water. The captain remains with the crippled ship, as it sways in the surf. To compound matters, a cyclone is expected to make landfall in India soon, which will accelerate the currents, and the spill, into the Bay of Bengal and towards Bangladesh. An environmental disaster is imminent, impacting the countries of India, the Maldives, Sri Lanka and Bangladesh.

MAP



MASTER SCENARIO EVENT LIST

Inject Number	Inject Type	Inject Time	Send From	Send To	Inject Summary
PHASE 1: PLANNING (1330-1430)					
1	Expected Action	1330	SIMCELL	ALL	Devastation from the shipwreck is widespread. Fish are dead throughout the South Asian region. Pollutants still leaking from the ship and containers. Pirates remain at-large. Reef extensively damaged.
2	Expected Action	1400	SIMCELL	ALL	Cultural antiquities were also aboard the wrecked vessel. Spill has severely impacted economies and food/water supplies for several countries. Pirates have been captured.
3	Contextual	1430	SIMCELL	ALL	PAUSE
PHASE 2: OPERATIONS (1500-1600)					
4	Expected Action	1500	SIMCELL	ALL	Refuse stored in the hull of ship needs to be extracted before additional leakage occurs in the sensitive ecosystem. Fuel and industrial pollutants continue to detrimentally impact the environment. Regional security measures need to be employed to ensure pirates cannot capture another commercial vessel.
5	Expected Action	1530	SIMCELL	ALL	Spill has been contained. To remove the vessel from the reef, a platform is required to be erected. Placement of the platform is critical to avoid additional environmental impacts. Furthermore, the salvage needs to utilize a cost-effective alternative energy solution.
6	Contextual	1600	SIMCELL	ALL	END

INJECTION 1

Inject #:	1	Inject Time:	1330
Delivery Method:	Flip Chart, PPT, Verbal Announcement	Objective(s):	To evaluate the immediate actions required to respond to the shipwreck and conduct an environmental baseline survey
From:	SIMCELL	To:	All Participants
Inject:	Devastation from the shipwreck is widespread. Currently, oil and industrial pollutants can be found in Exclusive Economic Zone (EEZ) waters of the Maldives, India, Sri Lanka and Bangladesh. The industrial hazardous material from the containers remains unknown, but appears to be a liquid petroleum or detergent that is toxic. Large amounts of dead fish are washing up along the shorelines of the aforementioned countries. Pollutants are still leaking from the ship and its sunken containers. The area of coral reef where the ship crashed appears significantly damaged, and the ship's hull is still lodged on it. Additionally, the pirates that caused the damage have not been located. Their whereabouts remain unknown. 		
Questions:	1. What will be the priority of actions required to mitigate the situation? Please order the list below. - Apprehend the pirates. - Conduct an environmental baseline survey to determine the extent of the spill and damage caused. - Remove the sunken ship. - Contain the ship seepage. - Contain the chemical spill. - Evaluate the hazard of industrial elements. - Coordinate with regional partners and authorities since the spill extends beyond one country's Exclusive Economic Zone. 2. How will an environmental baseline survey be completed at the shipwreck site? What are the differences between countries in this approach? What are the differences between civilian institutions and the military? Would a partner from outside of the region be permitted to assist? Is there any political sensitivity to outside assistance?		

INJECTION 2

Inject #:	2	Inject Time:	1400
Delivery Method:	Flip Chart, PPT, Verbal Announcement	Objective(s):	To examine heritage and preservation considerations; to evaluate public relation strategies; to identify potential resources for environmental response in the region
From:	SIMCELL	To:	All Participants
Inject:	To complicate matters, cultural antiquities from Nepal and Bhutan were aboard the sunken vessel. They were being shipped to Bangkok for a temporary exhibition at a museum there. The antiquities appear recoverable, but they have been exposed to some of the pollutants. The container holding them floated and crashed into a reef, where they were exposed. Meanwhile, the spill from the shipwreck has severely impacted the economies, food supply and water supply of several countries. The Maldives marine fisheries are currently unapproachable due to the amount of pollutants. Ports are closed. Offshore aquaculture businesses in India have experienced catastrophic loss. Sri Lankan and Bangladeshi fisherman are also experiencing difficulty, especially subsistence and commercial boats. In more positive news, the pirates have been captured by the Maldives National Defence Force.		
Questions:	1. What heritage and preservation practices can be employed to save the cultural antiquities? 2. What can individual governments, as well as regional institutions do, to warn the public about contaminated water and food sources? 3. What practices will be implemented by governments to identify alternative food and water sources? 4. What equipment and resources can each country provide to assist with the spill response efforts? Please provide a list.		



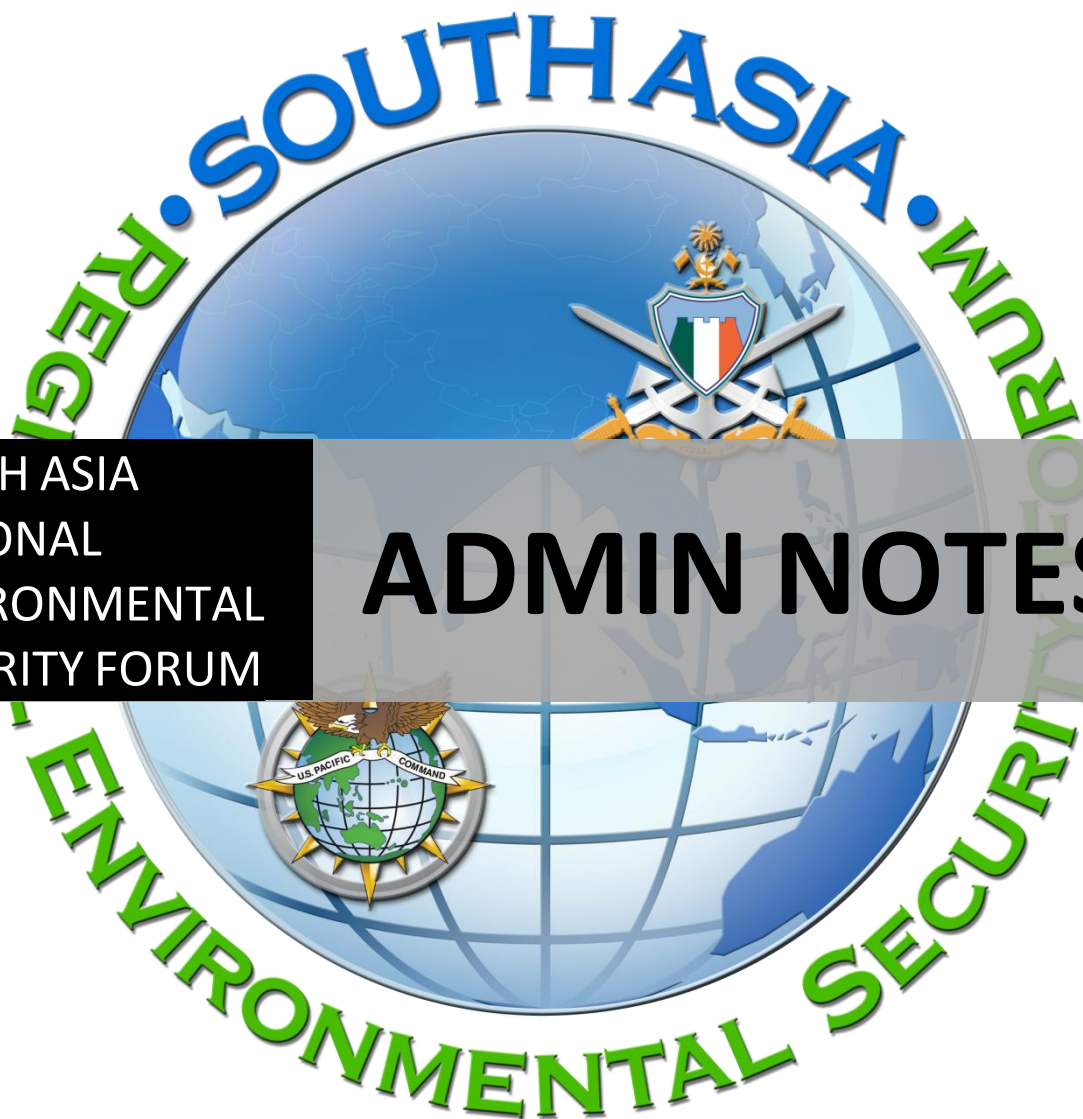
INJECTION 4

Inject #:	4	Inject Time:	1500
Delivery Method:	Flip Chart, PPT, Verbal Announcement	Objective(s):	To examine hazardous material considerations in environmental response; to inspect the role of militaries in trans-boundary environmental issues; to evaluate how various parties respond to public demand for change and regional cooperation
From:	SIMCELL	To:	All Participants
Inject:	Divers responding to the environmental disaster have discovered hazardous materials stored in the sunken hull. The waste was being transported to Southeast Asia to be incinerated. There is a desperate need to extract the waste before it impacts the sensitive ecosystem. Additionally, fuel and industrial pollutants continue to detrimentally impact the environment. The spread of contaminants has nearly been contained, but the problem is not fully mitigated. Clean-up crews from across the globe have been deployed and are actively working together to recover from the environmental disaster. Lastly, the public is demanding a regional security solution be developed to ensure pirates cannot capture another commercial vessel and cause more damage to the environment, economies, and citizens. Many remain fearful that another incident could occur. 		
Questions:	1. Should an attempt be made to extract the hazardous waste from the ship? If so, what techniques can be deployed to extract the waste from the ship without causing additional damage to the ocean environment? 2. Should representative militaries be involved in environmental response if the incident has occurred outside of their territory? 3. What regional measures can be enacted to quell fears regarding counter-piracy in South Asia? 4. What processes can be implemented to better monitor hazardous waste transport through South Asia and international waters?		

INJECTION 5

Inject #:	5	Inject Time:	1530
Delivery Method:	Flip Chart, PPT, Verbal Announcement	Objective(s):	To identify alternative energy solutions to support the recovery of the environment; to examine public-private partnership opportunities; to discover regional mitigation solutions for the long-term recovery of the environment
From:	SIMCELL	To:	All Participants
Inject:	Good news! Through the hard work of dedicated civilians and the military, the spill at the ship has been contained. However, the vessel still on the reef, and there is a need to extract it for salvage. To remove the vessel, a temporary platform could be erected so a hoist can lift it, place the remains on a barge, and transport it to the nearest port. The sighting of the platform is critical to avoid additional environmental impacts. Furthermore, the extraction needs to utilize a cost-effective alternative energy solution as traditional oil-based fuel supplies are not currently available. 		
Questions:	1. What will be the criteria to properly position the platform? Please mark the location on the map. 2. Could public-private partnerships be used to salvage the vessel? What are the advantages and disadvantages of doing so? 3. What energy conservation measures could the recovery mission incorporate to reduce the cost of the salvage operation? 4. What long-term mitigation projects can be operationalized at the shipwreck site to enhance the environment and its condition?		

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ADMIN NOTES



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ADMINISTRATIVE DETAILS



The 2014 South Asia Regional Environmental Security Forum (RESF) will be held in the Republic of Maldives. The Forum dates are June 2-5 at the Kurumba Hotel. Please find below a few comments with basic information.

VENUE: Kurumba Hotel – Male, Maldives

DRESS CODE: In keeping with Kurumba Hotel policy, the dress code for the entire event will be business casual (slacks, but no tie).

CLIMATE: The average climate in the Maldives for the months of May and June is 30°C / 87°F, with some rain. The hotel does provide umbrellas for the individual guests. Due to its close proximity to the equator, the sun is very intense in the Maldives. As such, a hat and sun-screen is highly recommended. Additionally, mosquitoes are part of the island life, so insect repellent (bug spray) is also highly recommended.

TRANSPORTATION: Upon arrival to Male International Airport, representatives from the Maldives National Defense Force (MNDF) will be there to greet participants and will provide transportation to the hotel via boat. Please look for a *SARESF* sign.

Attendees arriving very late at night or very early in the morning may be transported by the Kurumba Hotel. Please look for a *Kurumba* sign.

At the end of the event, MNDF will provide transportation to the airport for most attendees. The organizing team will make arrangements for very early departures and provide participants with more information as departure times become available

REGISTRATION TABLE: Participants are to register at the SARESF desk in the lobby on day one of the Forum. Participants will be issued an ID with name and country and a Forum packet. The ID's are to be worn while in attendance at all Forum events. The ID also includes a colored sticker, which will indicate a work group assignment for the week.

SETTLING ACCOUNTS: All bills, including in-room telephone calls, mini bar, laundry and room service, are the participant's responsibility and must be settled prior to departure. The hotel accepts all major credit cards.

PERSONAL EQUIPMENT: The voltage used throughout the Maldives is 220V – 240V AC, at 50Hz, using a 3-pin plug and socket (as per figure below).



DIET: Halal meals will be served at the Forum.

SITE VISIT: Day 2 of the Forum consists of a site visit to Thulusdhoo Island; it will involve walking and a boat ride that will last approximately 40 minutes. All participants are required to attend. Please advise if there are any physical disabilities which will prevent you from participating. Participants will be given time to change into more casual clothing for the site visit. Shorts and light shirts are acceptable.

SPECIAL NEEDS: Please advise the organizing staff of any special needs or disabilities. Smoking is allowed in designated areas, but not in the hotel rooms.

MEDICAL FACILITIES: The hotel will provide medical assistance, if required. Arrangements will be made for medical care by specialists at the participant's own expense. Participants are also advised to procure their own medical insurance/coverage for themselves and their travelling partners.

BANKING: Currency exchange booths operate at the Male Airport. Kurumba Hotel accepts all form of currencies and credit cards and you likely will not need to exchange for Maldivian rufiyaa (prices in Kurumba's restaurants and establishments are in USD\$).

SECURITY: For security and safety purposes, only those persons registered with the hotel and for the Forum will be allowed entry into the Main Room and Breakout Rooms.



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ICEBREAKER



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Ice Breaker

Time: 1730 – 1900 hrs
Date: 2 June 2014
Venue: Kuda Bandos Beach
Attire: Aloha/Casual



Introduction

At the conclusion of Day 1, MNDF will host all participants to a beach party. This will be an opportunity for the participants to enjoy conversation over halal food (ex. Maldivian style BBQ) and drinks.

The event will be held on Kuda Bandos Island, which is a 15 minute boat ride from the conference location. The event will be held at one of the most exotic locations of the island, where the participants can enjoy the scenic beauty of Maldivian beaches with the calm caressing waves breaking on its shores. The dazzling night sky and aromatic marine breeze will sooth the minds and gear up the participants for the scheduled hectic days ahead.

The beach area will be set up with tables for the participants to rest their glasses, and to further enrich the evening, a three-piece-band will play. The session will officially kick-off with a welcome note by the Chief of Defence Force, Major General Ahmed Shiyam.

Furthermore MNDF will host a cultural troupe performing a folk dance, Bodu Beru, and Maldivian traditional dance show. This will be a great opportunity for the participants to take pictures and experience Maldivian culture.

Aim

To enable the participants to mingle and get to know each other in order to facilitate a smooth flow of discussions during the Forum.

Extra events at Ice Break

- Three piece band
- Bodu beru (Maldivian traditional music and dance)
- Ladies Dance Group

Catering

- Welcome drinks
- BBQ stand
- Buffet stand

Time lime

1730 International Participants gather at pier
1800 Maldivian participants departs from Jetty 3
1800 International participants Departure from Kurumba
1820 Arrival at Kuda Bandos
1830 Participants seated
1840 CDF welcome remarks
1900 BBQ (Maldivian style) begins
2100 Participants gather at pier
2110 Departure from Kuda Bandos
2120 Arrival at Kurumba



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OFFICIAL DINNER



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Dinner Hosted by COL (Ret.) Mohamed Nazim, Minister of Defence and National Security



Time: 2000 – 2100hrs

Date: 4th June 2014

Venue: Bandos Island Resort

Attire: Smart Casual (open collar)

Introduction

The South Asia Regional Environment Security Forum seeks to foster enduring relationships by bringing together participants from the region. The objective of the Forum is to address common environmental security concerns, through responsible civil and military action in addition to international dialogue to stimulate proactive military support for regional environmental security. As such, the Minister of Defence and National Security COL (Ret.) Mohamed Nazim would like to host an official dinner to appreciate the contribution of participants and facilitators.

The official dinner will be hosted at Bandos Island Resort on 4th June 2014 from 20:00hrs to 21:00hrs.

Extra events at Dinner

- 3 piece band

Catering

- Welcome drinks
- Buffet

Timeline

- 1915 Maldivian participants depart from Male' jetty 3
- 1900 International participants gather at Kurumba jetty
- 1915 International participants depart from Kurumba
- 1930 All participants seated at Bandos banquette hall
- 1950 MoDNS remarks
- 2000 Dinner
- 2100 All participants gather at Bandos jetty
- 2110 Departure from Bandos

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SOUTH ASIA
REGIONAL
ENVIRONMENTAL
SECURITY FORUM

THULUSDHOO ISLAND TOUR



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Thulusdhoo Island Site Visit Map

Republic of Maldives



MALDIVES

Thulusdhoo Island

Male Atolls

Felidhoo Atoll

Mulaku Atoll

Hadhdhunmathee Atoll

Huvadhoo Atoll

Addu Atoll

Seenu

Thiladhunmathee Atoll

Maamakunadhoo Atoll

Maalhosmadulu Atolls

Goldhoo Atoll

Ari Atoll

Niandhoo Atoll

Kolhumadulu Atoll

Ihavandhippolhu Atoll

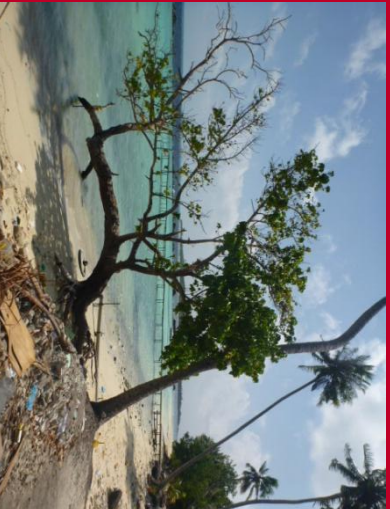
ROUTE	TIME (MIN)	DISTANCE (M)
1-2	5	300
2-3	15	880
3-4	10	670
4-5	1	50
5-1	5	300

STOP 1 - PIER



The pier is the primary entrance to the island. It includes a covered walkway, park, and seating area. The pier will serve as a stop along the walking route to ensure each participant gets an opportunity to re-hydrate.

STOP 2 – COASTAL EROSION



This portion of shoreline was eroded during the 2004 Boxing Day Tsunami. It features exposed sewerage outfalls, sand accretion, vegetation loss, soil

wash, coral reef damage, and rudimentary shoreline protection measures. Without proper shore protection and a coastal zone management plan, this area of the island will continue to experience sand loss, salinity intrusion, coastal erosion and other problems. Increased sea levels, due in part to climate change, will add complexity and severity to these issues.

STOP 3 – WASTE DISPOSAL AREA



Island waste management is difficult due to lack of land, sensitive water resources and long distances to alternate disposal sites. Developing solutions that reduce waste volume and exposure to contaminants is important. The fenced waste area was established by the UN after the 2004 tsunamis. It is filled to capacity and locked but waste (burning) continues adjacent to the site and along roads. A portable gasifier can

reduce waste volume and exposure to usable. From data in the EBS and observations on the tour - where else could a portable gasifier be placed?

STOPS 4 & 5 – COCA-COLA

The Coca Cola Bottling factory is operated by the Male Aerated Water Company, and is the largest industrial complex on the island. The company has a well-developed communications network to facilitate operations, which also benefits the island community. The company adheres to international certification standards and maintains a thorough and safety-oriented waste management system.

The property also features a large visitor center, where guests can recuperate in an air conditioned environment and enjoy refreshments.

The facility desalinates water on-site, and has a successful distribution network throughout the Maldives.





SOUTH ASIA
REGIONAL
ENVIRONMENTAL
SECURITY FORUM

KURUMBA ISLAND MAP



Co-Sponsored by: | Maldives National Defence Force and
the U.S. Pacific Command

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Kurumba Island - RESF Event Map

Republic of Maldives



ID	DESCRIPTION
1	Conference Hall
2	Admin Room
3	Restroom
4	Breakfast/Lunch Area
5	Watersports Area
6	Reception/Business Center
7	Boat Pickup/Dropoff Location
8	Spa
9	Gym
10	Mosque
11	Arabic Restaurant
12	Chinese Restaurant
13	Indian Restaurant
14	Italian Restaurant
15	Japanese Restaurant
16	Beach Bar
17	Doctor's Office