



Concept Note

Pathway towards Improved Water Education Curricula 27-28 November 2017, Penang Malaysia

Background

Sustainable water solutions, whether at the local, regional and global levels, require creativity, new advances in scientific knowledge, discoveries and innovations through strong scientific cooperation. Innovation geared towards sustainable development has the potential to lift economic growth, create green jobs, and boost inclusive social development while at the same time contributing to water protection and conservation. Providing solutions to the current global water challenges require upscaling of existing local approaches and knowledge of the interrelations between environmental conditions and the state of water resources as well as instruments and techniques for water management at local, national and regional levels.

The UNESCO Jakarta Regional Sciences Bureau for Asia and the Pacific implements the project “Upscaling water security to meet local, regional, and global challenges” financially assisted by Malaysia Funds-in-Trust, as a significant contribution towards UNESCO-IHP’s phase 8 and its Strategic Plan for 2014-2021: “Water Security Responses to local, regional and global challenges”, as well as the 2030 Agenda and Sustainable Development Goal six: “Ensure availability and sustainable management of water and sanitation for all”.

Under this project, a *Water Management Curriculum using Ecohydrology principles and Integrated Water Resources Management (IWRM)* has been published by the Regional Humid Tropics Hydrology and Water Resources Centre for Southeast Asia and The Pacific (HTC KL), a Category 2 Centre under the auspices of UNESCO. The curriculum focuses on watershed management especially for river basins and includes recommendations on innovative stormwater and water quality management technologies, best management practices and policy options to address negative impacts of urbanization. This curriculum provides the necessary background for understanding ecohydrology and IWRM practices in Malaysia in order to improve watershed management from various angles – through technical, management and policy coordination and integration processes.

The experiences of countries in Asia and the Pacific and Africa in implementing tools, technologies and technical assistance programmes - as well as their collective needs and challenges in adaptation and application of Ecohydrology and IWRM - were addressed during the *Workshop on Comparative Studies of Applying Ecohydrology and IWRM for Upscaling Water Security in Asia and Africa* held from 7-9 March 2016

in Kuala Lumpur. The outcomes of this event provide a basis for further discussion to identify gaps towards establishing pathways towards water education curriculum.

To promote broader application of the recommended approaches, there is now a need to understand the water education practices of other countries in Asia and the Pacific and Africa with regard to Ecohydrology and IWRM for upscaling water security. Education curricula and modules differ from country to country, as approaches and technologies related to Ecohydrology and IWRM assessments are context-specific. Understanding the different approaches, as well as their range and variation, will enable the strengthening of regional collaboration and the establishment of a pathway towards new and improved water education curricula.

To realize this pathway, UNESCO Jakarta Regional Sciences Bureau for Asia and the Pacific, in partnership with River Engineering and Urban Drainage Research Centre (REDAC) Universiti Sains Malaysia, are now organizing the “Regional Workshop: Pathway towards Improved Water Education Curricula” as part of the project “Upscaling water security to meet local, regional, and global challenges” supported by the Government of Malaysia through Malaysia Funds-in-Trust.

Workshop details

The workshop will take place on 27-28 November 2017 in Penang, Malaysia. It brings together around 35 participants from universities, UNESCO Natural Sciences Category 2 centres and institutes, UNESCO chairs, and other stakeholders working in the field of education in Asia and the Pacific and Africa.

Objective

The objectives of the *Pathway towards Improved Water Education Curricula* workshop are:

- to share and discuss Water Management Curriculum developed by HTC-KL;
- to share experience and practices on water education among countries in Asia and the Pacific and Africa, in particular water management curricula;
- to establish pathways towards improved water education curricula;
- to create a platform for collaboration among category 2 water centres in Asia Pacific and Africa to promote and progress pathways towards improved water education curricula and strengthen cooperation on IWRM.

Expected outcomes

- Best practices on water education curricula from Malaysia and other countries compiled and shared;
- Gaps identified in establishing pathways towards improved water education curricula;



- Recommendations for regional and/or inter-regional collaboration developed.

Workshop program

- Presentation on the Water Management Curriculum by HTC-KL
- Presentation by universities, UNESCO Category 2 Centres and Chairs and other stakeholders on experiences of water education, challenges and lessons learned
- Discussions and recommendations

Annex I - Tentative Programme

Day 1 – 27 November 2017

Time	Activity
08:30-09:00	Registration Day 1
09:00-09:30	<p>Opening session</p> <ul style="list-style-type: none"> • Prof. Dr. Shahbaz Khan, Director, Regional Bureau for Science, Asia and the Pacific Region, UNESCO Office Jakarta • Prof. Dr. Nor Azazi Zakaria, Director of River Engineering and Urban Drainage Research Centre (REDAC), Universiti Sains Malaysia • Dato' Ir. Hj. Nor Hisham bin Mohd Ghazali, UNESCO-IHP Malaysia
09:30-10:00	<p>Setting the scene: - by Hans Dencker Thulstrup, UNESCO Office Jakarta</p> <p>Keynote presentations: Water Management Curricula and Pathway towards Improved Water Education Curricula – Asian perspective <i>Ir. Rohani Ahmad, HTCKL</i></p> <p>Pathway towards Improved Water Education Curricula – African perspective <i>Yohannes Zerihun Negussie, Ministry of Water and Energy of the Republic of Ethiopia/African Ecohydrology Centre (tbc)</i></p>
10:00 - 10:30	Coffee Break & Photo Session for the launching of “Water Management Curricula using Ecohydrology and IWRM” and “Customizing IWRM at the River Basin Level” by Prof Shahbaz Khan
10:30 – 13:00	<p>Session 1 - Water Management Curricula using Ecohydrology and IWRM</p> <p>Volume 1 topic: “Freshwater Ecosystem, River Ecosystem, Lake Eco System” <i>Dr Nur Asmaliza Mohd Nor, Fakulti Kejuruteraan Awam, Universiti Teknologi MARA Pahang</i></p> <p>Volume 2 topics: “Understanding Lake Environmental Management and Expert System Monitoring” <i>Dr Arien Heryansyah, Faculty of Engineering, Universitas Ibn Khaldun Bogor (UIKA Bogor), Indonesia</i></p> <p>“Phytoremediation Technique in Water Quality Improvement” <i>Dr Norlida Mohd Dom, Deputy Director, HTCKL</i></p> <p>“Highland Drainage, Debris and Mudflow, Sediment Erosion and Landslide Control” <i>Dr Nur Asmaliza Mohd Nor, Fakulti Kejuruteraan Awam, Universiti Teknologi MARA Pahang</i></p> <p>“Erosion and its Effect” <i>Dr Mohd Sofiyen Sulaiman, School of Ocean Engineering, Universiti Malaysia Terengganu</i> <i>Co-author: Prof Roslan Zainal Abidin, President, Infrastructure University of Kuala Lumpur</i></p>

	<p>Volume 3 topics :</p> <p>Water Management Curricula using Ecohydrology and Integrated Water Resources Management- Volume 3 Topics: 8-13 <i>Prof Adj. Dr. Mohd Roseli Zainal Abidin, Former Director of HTC KL</i></p> <p>“Sustainable Science for Secondary School Teacher” <i>Prof Dr. Munirah Ghazali, Coordinator, RCE ESD Penang, USM</i></p> <p>Q&A Reviewers: Associate Professor Dr Nabsiah Abdul Wahid, Universiti Sains Malaysia Prof Ismail Abustan, Universiti Sains Malaysia Prof Dr. Junaidah Ariffin, University Technology Mara (UiTM)</p>
13:00 – 14:30	Lunch
14:30 – 16:00	<p>Session 2 – IWRM Customization and IWRM integration into education curricula</p> <p>“Customising IWRM at the River Basin level” <i>Dr. Norlida Mohd Dom, HTCKL, Malaysia</i></p> <p>“IWRM Guidelines at river basin level: an appropriate and applicable approach” <i>Tadashige Kawasaki, NARBO Secretariat (skype)</i></p> <p>“Integrating IWRM into education curricula in Myanmar” <i>Mr. Myo Tun Oo, Department of Meteorology and Hydrology, Myanmar</i></p> <p>“Integrating IWRM into education curricula in Cambodia” <i>Dr. Ly Sarann, Dean of the Faculty of Hydrology and Water Resources Engineering, Institute of Technology of Cambodia</i></p> <p>Q&A</p>
16:00 – 16:15	Coffee break
16:15 – 17:45	<p>Session 3 – Implementation of water education throughout the region: lessons learned and recommendations</p> <p>“Integrating ecohydrology into syllabus in East Nusa Tenggara, Indonesia: lessons learned, impacts and recommendations” <i>by Maria Yustiningsih, Universitas Timor, Indonesia</i></p> <p>“Water education in Timor Leste” <i>by Ms. Zulmira Ximenes da Costa, Universidade Nacional Timor Lorosa'e, Timor Leste</i></p> <p>“Co-learning methodology applied to water governance” <i>by Susana Neto, Research Member, Civil Engineering, Research and Innovation for Sustainability, University of Lisbon</i></p> <p>“Current ecohydrology initiatives at the Putrajaya lake and wetland towards a global reference site” <i>by Ahmad Zubir Sopian, Director (Environment, Lake and Wetland), Perbadanan Putrajaya (tbc)</i></p> <p>“Community education for Langat River Basin and Langkawi Geopark”</p>

	By Dr Rahmah Elfithri, LESTARI UKM, Malaysia
	Q&A
17:45 – 18:00	Conclusion

Day 2 – 28 November 2017

Time	Activity
08:30-09:00	Registration Day 2
09:00-10.30	<p>Session 4 – Promoting Ecohydrology and Integration into Education Curricula In the Region</p> <p>Keynote presentation: “Synthesis Report and Guideline for Strengthening Collaboration between Asian and African Category-2 Water Centres and Chairs for Upscaling Water Security to Meet Local, Regional, and Global Challenges” by Adj./Prof Jeffrey Keith Camkin, University of Western Australia</p> <p><u>Panel discussion:</u> “The strategic role of regional centres, institutes and chairs in promoting ecohydrology and integration into education curricula in the region”</p> <p>Humid Tropics Centre Kuala Lumpur, Malaysia Asia-Pacific Centre for Ecohydrology, Indonesia Regional Centre for Integrated River Basin, Nigeria African Regional Centre for Ecohydrology, Ethiopia (tbc) UNESCO Chair on Water Reuse, Iran Regional Institute of Water Education Iran</p>
10.30-10.45	Coffee break
10.45–11.45	<p>Session 5 – Pulling it all together: way forward for integrating IWRM into curriculum <i>Chaired by: Hans Dencker Thulstrup</i></p> <p>All participants: Universities, Category 2 Centres and Chairs and other stakeholders - Ethiopia, Indonesia, Iran, Malaysia, Nigeria, Timor Leste</p>
11.45-12.00	<p>Closing Remarks</p> <ul style="list-style-type: none"> • Ir. Rohani Ahmad, Director, HTCKL • Prof. Dr. Nor Azazi Zakaria, Director, REDAC • Prof. Dr. Shahbaz Khan, Director, Regional Bureau for Science, Asia and the Pacific Region, UNESCO Office Jakarta
12:00–13:00	Lunch
13:30–17:00	Optional site visit to <i>UNESCO World Heritage George Town</i>

Annex II - Target participants

1. Dato' Ir. Hj. Nor Hisham bin Mohd Ghazali, UNESCO-IHP Malaysia
2. Mr. Khairul Hazlan, Program Officer from Malaysian National Commission for UNESCO
3. Ir. Rohani Ahmad, Humid Tropics Centre Kuala Lumpur / Department of Irrigation and Drainage, Malaysia
4. Dr Norlida binti Mohd. Dom, Humid Tropics Centre Kuala Lumpur / Department of Irrigation and Drainage, Malaysia
5. Dr Ignasius Sutapa, Executive Director, Asia-Pacific Centre for Ecohydrology (APCE), Indonesia
6. Dr M.A. Banihashemi, Regional Institute for Water Education (RIWE), University of Tehran
7. Dr Mohammad Hossein Sarrafzadeh, UNESCO Chair on Water Reuse, University of Tehran, University of Tehran
8. Ms. Maria Yustiningsih, Universitas Timor, East Nusa Tenggara, Indonesia
9. Ms. Zulmira Ximenes da Costa, Universidade Nacional Timor Lorosa'e, Timor Leste
10. Adj/Prof Jeffrey Keith Camkin, the University of Western Australia
11. Dr. Susana Neto, Civil Engineering, Research and Innovation for Sustainability, University of Lisbon
12. Dr Omogbemi Omolaju Yaya, UNESCO Category 2 Regional Centre for Integrated River Basin Management (RC-IRBM), Nigeria
13. Yohannes Zerihun Negussie, Ministry of Water and Energy of the Republic of Ethiopia/African Ecohydrology Centre, Addis Ababa, Ethiopia
14. Mr. Myo Tun Oo, Department of Meteorology and Hydrology, Ministry of Transport, Government of the Union of Myanmar
15. Dr. Ly Sarann, Dean of the Faculty of Hydrology and Water Resources Engineering, Institute of Technology of Cambodia
16. Tadashige Kawasaki, NARBO Secretariat, Japan
17. Dr Rahmah Elfithri, Senior Lecturer/Research Fellow, Institute for Environment and Development (LESTARI), Universiti Kebangsaan Malaysia
18. Dr Arien Heryansyah, Faculty of Engineering, Universitas Ibn Khaldun Bogor
19. Dr Nur Asmaliza Mohd Nor, Universiti Teknologi MARA Pahang
20. Prof Ir. Dr. Lariyah Sidek, University Tenaga Malaysia (UNITEN)
21. Prof Dr. Munirah Ghazali, Universiti Sains Malaysia (USM)
22. Dr Mohd Sofiyon Sulaiman, Infrastructure University of Kuala Lumpur (IUKL)
23. Prof Adj. Dr. Mohd Roseli Zainal Abidin, former Director of HTC KL
24. Associate Professor Dr Nabsiah Abdul Wahid, USM
25. Prof Dr. Ismail Abustan, University Science Malaysia (USM),
26. Prof Dr. Junaidah Ariffin, University Technology Mara (UiTM)
27. Prof Roslan Zainal Abidin, Infrastructure University of Kuala Lumpur
28. Dr. Siti Humaira Haron, Universiti Tenaga Nasional (UNITEN), Putrajaya
29. Ahmad Zubir Sopian, Director (Environment, Lake and Wetland), Perbadanan Putrajaya



UNESCO Office Jakarta

1. Prof Shahbaz Khan, Director
2. Hans Dencker Thulstrup, Programme Specialist
3. Trita Katriana, National Project Officer
4. Dinanti Erawati, Administrative Assistant