Synthesis Report and Recommendations for Strengthening Collaboration between Asian and African Category-2 Water Centres and Chairs for Upscaling Water Security to Meet Local, Regional, and Global Challenges

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Pathway towards Improved Water Education Curricula
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What I will address

>> Purpose of this consultancy <<

>> Aims of the *Upscaling Water Security to Meet Local, Regional and Global Challenges* project <<

>> Key project activities, findings and conclusions <<

>> Recommendations for Research, Education and WRM from the project outputs <<

>> >> Some reflections for discussion <<

Purpose of the Synthesis Report

As the project is coming to an end by December 2017, a synthesis report is needed to link all activities and outputs into one document.

The report aims to capture:

1) how Ecohydrology and HELP approaches have been demonstrated, showcased and upscaled in water management in Asia and the Pacific, as well as Africa

2) how scientific collaborations have been strengthened in order to support, design and implement Ecohydrology and HELP strategies and policies for sustainable WRM

The synthesis report will also make recommendations on how to strengthen such collaboration in order to successfully upscale water security to meet local, regional, and global challenges.

Documents included in the synthesis

	Output	Project Component
1	Research Report: Demonstration of Ecohydrology Biotechnologies in Putrajaya Lake and Wetland, Malaysia – Ecosystem Services Economic Assessment (November 2015)	Research
2	Workshop Proceedings: International Seminar 2016 on The Ecohydrology Management of Putrajaya Lake and Wetland (January 2016)	Research
3	Workshop Report: Comparative Studies of Applying Ecohydrology and IWRM for Upscaling Water Security in Asia-Pacific & Africa (March 2016)	Research / Education / Water management
4	Book: Customising IWRM at the River Basin Level (2017)	Education
5	Curricula: Water Management Curricula Using Ecohydrology and IWRM - Volumes 1, 2 and 3 (2017)	Education
6	Technical Report: Southeast Asian Water Footprint Course (February 2015)	Water management
7	Research Report: Upscaling Water Security to Meet Local, Region and Global Challenges w.r.t Africa (2016)	Water management
8	Workshop Report: Inter-regional Workshop on South-South Cooperation for Upscaling IWRM and Ecohydrology as Tools for Achieving Water Security in Africa (2017)	Water management
9	Workshop Recommendations: Inter-regional Workshop on South-South Cooperation for Upscaling IWRM and Ecohydrology as Tools for Achieving Water Security in Africa (2017)	Water management
10	Workshop Proceedings: Building Resilience to Climate Change Risk and Vulnerability to Meet Water Security Challenges (July 2017)	Water management
11	Workshop Report: Building Resilience to Climate Change Risk and Vulnerability to Meet Water Security Challenges (July 2017)	Water management

My challenge

To synthesise 1,433 pages from 13 project outputs into a 40 page report

To tell a brief, yet comprehensive story of what the project achieved

To do justice to the excellent work of all of those involved

Structure of the Synthesis Report

Section 1: Introduction

Section 2: Summary of outputs - activities, findings and conclusions

Section 3: Recommendations on Research, Education and WRM - from outputs

Section 4: Recommendations for Strengthening Collaboration between Asian and African Category-2 Water Centres and Chairs for Upscaling Water Security to Meet Local, Regional and Global Challenges – my reflections

Aims of the *Upscaling Water Security to Meet Local, Regional and Global Challenges* project

To provide solutions to current global water challenges that require the upscaling of existing local approaches & knowledge of the interrelations between environmental conditions & the state of waters, by:

➤ Providing innovative storm water & water quality management technologies, best management practices & policy options to counter negative effects of urbanization

➤ Promoting and enhancing Ecohydrology and HELP approaches, knowledge and implementation on the ground

➤ Creating a platform for the collaboration and exchange of scientific, technical and policy relevant information through collaboration between Asian-Pacific and African category-2 water centres.

Project components

Coordinated by the UNESCO Office Jakarta, in collaboration with UNESCO Water Chairs and Water-related centres in Asia and Africa and engaging a wide range of participants in universities, government, NGOs and business, there were three Project components:

➢ **Research Component**: Demonstration of ecohydrology biotechnologies – involving three activities and three main outputs

➢ **Education Component**: HELP and Ecohydrology Scoping – involving three key activities and three main outputs

➢ **Water Management Component**: Workshops on comparative studies of applying water footprints, Ecohydrology and IWRM through UNESCO Category-2 Water centres in Asia and Africa – involving five key activities and seven main outputs.

RESEARCH COMPONENT

Research Component - Documents Reviewed

1. Majizat, A., Noordin, N., Sapian, A., Rahman, N.A, Abdullah, N.H, Wa, Y.H, Ghani, A.N.A. 2015. The Ecosystem Services Economic Assessment of Putrajaya Lake and Wetland. Report for UNESCO Office Jakarta

2. Proceedings of the International Seminar 2016 on the Ecohydrology Management of Putrajaya Lake and Wetland. 19-20 January 2016. Dewan Seri Melati Perbadanan Putrajaya, Putrajaya Malaysia

3. HTCKL, 2016. Comparative Studies of Applying Ecohydrology and IWRM for Upscaling Water Security in Asia-Pacific & Africa. Workshop Report for UNESCO Office Jakarta

Research Component - Aims

Aims of the research component were:

(i)   advancing the state of the art of ecosystem services economic assessment

(ii)   Understanding the value of Putrajaya Lake's ecosystem services

(iii)   Assessing the willingness of the local population, tourists, visitors and other stakeholders to pay for ecosystem services.

Research Component - Findings and Conclusions (1)

Advancing the state of the art of ecosystem services economic assessment

➢ *Capacity Building and Training* - In general, scientists and engineers involved in lake management in Malaysia are not familiar with economic assessments of ecosystem services and capacity building (training) is needed.

➢ *Regional Cooperation for Knowledge Exchange* – While the workshops brought together several lake managers, a major problem faced is that most of the lakes managers in the region are not easily contactable and are not permanently attached to any particular lake. Limited budgets are considered the main constraint to further collaboration.

➢ *Information Dissemination* - Information needs to be widely disseminated, readily accessible, easily understood by target audiences, consistent and encompassing all relevant issues.

Research Component - Findings and Conclusions (2)

Understanding the value of Putrajaya Lake's ecosystem services (1)

➢ *Total Net Present Value* – NPV was found to be ~ RM 5.88 Billion (~USD 1.38 Billion), considerably higher than the RM 1.2 Billion cost of construction.

➢ *The non-static value of constructed wetlands* – However, activities in & around the wetlands, including new activities that result from the construction (such as recreation on the lake), can erode those values over time if not well managed

➢ *Economic assessments of ecosystem services as a management input* – Understanding the values of ecosystem services related to lake and wetlands can lead to better informed, more efficient and fairer decision making.

➢ *Economic assessments are not everything* – While economic assessments can help, they will not always replace the need for decision makers to trade off and allocate where economics are not the primary consideration, for example in decisions relating to threatened species or serious health concerns.

Research Component - Findings and Conclusions (3)

Understanding the value of Putrajaya Lake's ecosystem services (2)

➢ *Identifying responsibilities for funding ecosystem maintenance* - This work identified that the ecosystem services create a wide range of valuable benefits for activities under the responsibility of different agencies and ministries. A potential use of this research is to more clearly identify the beneficiaries of ecosystem services and, therefore, potential funding sources.

➢ *Payment for Ecosystem Services* - Ecosystems provide society with a wide range of services but at present many of those services are either undervalued or have no financial value at all. The concept of PES has generated substantial international interest as a cost-effective means of improving environmental management and livelihoods by rewarding people for their efforts in providing ecosystem services.

Research Component - Findings and Conclusions (4)

Assessing the willingness of the local population, tourists, visitors and other stakeholders to pay for ecosystem services

➢ *Willingness to pay for different ecosystem services* – This study found willingness to pay for recreation & aesthetics was similar, but willingness to pay for conservation efforts was less than half that for recreation & aesthetics

➢ *Economic assessment of ecosystem services as a communication tool* - Understanding the values of the lake and wetlands can serve as a communication tool for informing society and decision makers. It is expected that this will help facilitate political commitment to policy solutions and greater appreciation of the need for sustainable financing mechanisms to be in place to maintain the continuity of these important lake and wetlands ecosystems.

Research Component – Recommendations (1)

1. *Capacity Building and Training* - Two training programs were proposed: A Lake Management Training Series and an Ecosystem Services Economic Assessment Training Series.

2. *Standardising Research Approaches* – There is a need to develop a standardized way of undertaking economic evaluations of ecosystems services to support decision making.

3. *Investing in Regional Cooperation for Knowledge Exchange* – UNESCO could provide funds for collaboration meetings and visits to selected lakes to enhance regional cooperation, including the formation of a Regional Lake.

Research Component – Recommendations (2)

4. *Information Dissemination* – Information should be widely disseminated to all stakeholders, be readily accessible, easily understood by target audiences, consistent and encompassing all relevant issues.

5. *Maintaining ecosystem services of lakes and wetlands* – Lakes and wetlands should receive continuous management efforts to address existing and new challenges that threaten the value of the ecosystem services they provide.

6. *Payment for Ecosystem Services* - Further development of a PES management plan was recommended for Putrajaya Lake and Wetland

EDUCATION COMPONENT

Education Component - Aims

HELP and Ecohydrology Scoping were the focus of the Education Component. The aim was to develop Water Management Curricula using Ecohydrology and IWRM in Asia and Africa countries focused on HELP and Ecohydrology training.

Education Component - Documents Reviewed

1. HTCKL, 2016. Comparative Studies of Applying Ecohydrology and IWRM for Upscaling Water Security in Asia-Pacific & Africa. Workshop Report for UNESCO Office Jakarta

2. Hezri, A. A, Dom, N. M., 2017. Customising IWRM at the River Basin Level. The Regional Humid Tropics Hydrology and Water Resources Centre for Southeast Asia and the Pacific (HTCKL), Kuala Lumpur

3. HTCKL, 2017. Water Management Curricula: Water Management Curricula using Ecohydrology and Integrated Water Resources Management. Volumes 1, 2 and 3. HTCKL, Kuala Lumpur

4. HTCKL, 2017(a). Water Management Curricula Volume 2

5. HTCKL, 2017(b). Water Management Curricula Volume 3

Education Component - Findings and Conclusions (1)

➢ *The uptake of IWRM is uneven across countries* - The key tasks for many countries involve tailoring or customizing IWRM tools to local contexts and bringing together the main actors from different sectors.

➢ *Implementation is case specific* - Customisation often means using appropriate knowledge & practices based on evidence to make IWRM interventions relevant to special needs of a locality in a particular river basin

➢ *Policy change needs optimal governance* - Despite formal declarations of IWRM policy adoption, its implementation to date is yet to gain adequate traction in many countries. The policy style of different countries, their institutional architecture, and local conditions must be taken into account in public policy design for IWRM.

Education Component - Findings and Conclusions (2)

➢ *Partnerships are key for knowledge building and problem-solving* - Customisation of IWRM will require creativity and new advances in knowledge, and discoveries and innovations through strong scientific collaborations in existing water networks in the Humid Tropics Region.

➢ *Ecohydrology is a promising customization tool* - The use of ecosystem properties as a management tool marks the shift from managing water by 'regulation of issues' to a holistic action focusing on the 'regulation of processes' in hydrological and ecological systems at the river basin level.

Education Component - Findings and Conclusions (3)

➢ *Megatrends for the future of water management* - The future of water management will be determined by at least three megatrends:

- The stationarity assumption is being challenged by new facts that point to non-stationarity or uncertainty in the modeling of hydrological systems

- With the launch of the 17 SDGs in 2015 the outlook on public policy has changed, along with the international development narrative

- In response, a 'new' sustainability science is being articulated, with the notion of sustainability moving centre stage.

➢ The theory and practice of IWRM and ecohydrology will evolve in tandem with these developments, with water security as the ultimate objective.

➢ At the heart of the technological and management innovations in the near and far future is the concept of the circular economy, which aims at closing the water resource loop in a holistic manner.

Education Component - Findings and Conclusions (4)

➢ The Curricula needs few enhancements – The curricula modules provide a deeper understanding of national (Malaysian) efforts to devise and implement effective adaptation education plans at various education levels.

➢ Approaches and technologies related to Ecohydrology and IWRM assessments, as well as resources and assistance for adaptation planning, need to involve government, stakeholders and NGOs through an implementation organisation and be project based.

➢ It was concluded that the modular curricula needed few enhancements, especially in the curricula framework itself.

Education Component - Findings and Conclusions (5)

➢ *HTC KL as UNESCO water champion* – Formal education is already fulfilled in other courses in Malaysia where water education is implemented through science subjects, but there is a shortage of water experts among educators.

➢ *Responding to the priorities of beneficiary countries* – Besides contributing to South-South cooperation, the Curriculum facilitates continuous networking for sharing knowledge in water education, empowers regional scientific collaboration in Ecohydrology and IWRM through Category 2 Water centres, and contributes to WRM development in at least five Least Developed Countries (LDC).

➢ *Linking education curricular, ecobiotechnology and ecohydrology* – It was noted that there are wide linkage between Malaysia, Philippines, Namibia, Nigeria, Pakistan, Japan and China on hydrological programmes, water management and curricular, water security issues and climate changes. These features would link with the education curricular, ecobiotechnology, and ecohydrology, where these curricular could be applied in universities.

Education Component - Recommendations (1)

➢ The recommended framework for mainstreaming IWRM and Ecohydrology covers four focus areas:

- Reduce pollution at source to prevent its entry into water bodies and degrading their quality

- Remedy the degraded water after it has been used by collecting it and treating it to remove harmful materials

- Re-use the water that has been cleaned to suitable standards for other purposes and recover the beneficial content such as nitrogen, phosphorus. organic matter, and energy so that it is not wasted

- Regulate the usage of water by putting in place the mechanisms to allow effective monitoring and implementation.

Education Component - Recommendations (2)

➢ Recommendation on the Water Management Curricula – Further improvement of the curricula books needs to be guided by curricula practitioners and comply with the existing contract between Department of Irrigation and Drainage, Malaysia and UNESCO Office Jakarta.

➢ Recommendation on HTC KL as a main UNESCO water champion – The Comparative Studies workshop recommended HTC KL move towards becoming a Water Education Hub to provide training, database sources & education linkages between universities & private sectors in water education.

WRM COMPONENT

WRM Component - Aims

The aim of the Water Resource Management Component was to share experiences in the application of IWRM and Ecohydrology approaches towards water security in Asia-Pacific and Africa.

WRM Component - Documents Reviewed (1)

1. HTCKL, 2016. Comparative Studies of Applying Ecohydrology and IWRM for Upscaling Water Security in Asia-Pacific & Africa. Workshop Report for UNESCO Office Jakarta

2. Malaysian Water Partnerships, 2015. South East Asia Water Footprint Course. Report for UNESCO Office Jakarta

3. Ahmed, A.A, Elmanadely, M.S, Meddi, M, Yaya, O.O., Mutua, F. 2016. Upscaling Water Security to meet Local, Regional, and Global Challenges with regards to Africa. Report for UNESCO Office Jakarta

4. RC-IRBM, 2017. Brief Report on the Inter-Regional Workshop on South-South Cooperation for Upscaling Integrated Water Resources Management (IWRM) and Ecohydrology as Tools for Achieving Water Security in Africa, 24-26 Jan 2017. Workshop Report for UNESCO Office Jakarta

WRM Component - Documents Reviewed (2)

5. Recommendations from the Inter-regional Workshop on South-South Cooperation for Upscaling IWRM and Ecohydrology as Tools for Achieving Water Security in Africa (2017)

6. REDAC, 2017. Building Resilience to Climate Change Risk and Vulnerability to Meet Water Security Challenges: Final Report. Workshop Report for UNESCO Office Jakarta

7. UNESCO, 2017. Building Resilience to Climate Change Risk and Vulnerability to Meet Water Security Challenges: Proceedings. UNESCO Office Jakarta

WRM Component - Findings and Conclusions (1)

Nine key challenges were identified for WRM in Africa:

i. The MDG target of reducing by half the proportion of the population without sustainable access to drinking water by 2015 was not attained

ii. The MDG target of reducing by half the proportion of population without sustainable access to basic sanitation was also not attained

iii. Africa has 63 shared water basins, so its a challenge to address potential conflicts over transboundary water resources

iv. Water scarcity challenges Africa's ability to ensure food security

v. Hydroelectricity supplies 32% of Africa's energy, but its electricity use is the lowest in the world

vi. Africa faces the challenge of providing enough water for its people at a time of growing demand and increased scarcity

vii. Land degradation and water pollution reduce water quality and availability

viii. Africa is one of the most vulnerable continents to climate change & variability

ix. Africa faces economic water scarcity, and current institutional, financial and human capacities for managing water are lacking

WRM Component - Findings and Conclusions (2)

South-South cooperation as a key to WRM in Africa. The basic objectives are interdependent and mutually supportive, and contribute to the broader objectives of international development cooperation in order to:

- foster the self-reliance of developing countries by enhancing their creative capacity to find solutions to their development problems in keeping with their own aspirations, values and special needs

- promote and strengthen collective self-reliance among developing countries through the exchange of experiences; the pooling, sharing and use of their technical and other resources; and the development of their complementary capacities

- strengthen the capacity of developing countries to identify and analyze together their main development issues and formulate the requisite strategies to address them

- increase the quantity and enhance the quality of international development cooperation through the pooling of capacities to improve the effectiveness of the resources devoted to such cooperation

WRM Component - Findings and Conclusions (3)

- create and strengthen existing technological capacities in the developing countries in order to improve the effectiveness with which such capacities are used and to improve the capacity of developing countries to absorb and adapt technology and skills to meet their specific developmental needs

- increase and improve communications among developing countries, leading to a greater awareness of common problems and wider access to available knowledge and experience as well as the creation of new knowledge in tackling development problems

- recognize and respond to the problems and requirements of the least developed countries, land-locked developing countries, small island developing States and the countries most seriously affected by, for example, natural disasters and other crises

- enable developing countries to achieve a greater degree of participation in international economic activities and to expand international cooperation for development.

WRM Component - Findings and Conclusions (4)

It was considered that Africa needs help in three priority areas:

(a) institutional reform

(b) information generation and management

(c) meeting urgent water needs.

Addressing these three fundamental needs would contribute to improved vitality, longevity and human productivity, which can serve as the springboard for socio-economic development.

WRM Component - Recommendations (1)

➢ The Inter-regional Workshop on South-South Cooperation for Upscaling IWRM and Ecohydrology as Tools for Achieving Water Security in Africa proposed a New Africa Water Approach be developed to stimulate a shift in thinking toward a more equitable and sustainable use and management of Africa's water resources for poverty alleviation, socio-economic development, regional cooperation and the environment.

➢ An associated framework for action towards the attainment of better livelihood should be defined, along with milestones, and Africa should learn from the experiences of other continents such as Asia in the field of IWRM.

WRM Component - Recommendations (2)

Upscaling Water Security to Meet Local, Region and Global Challenges w.r.t Africa identified two key areas contribution areas for UNESCO in Africa.

1. Promoting an integrated system of research, training, information and documentation services in fields related to water resources by:
    *   Proposing areas of research through announcements on UNESCO web site. Researches may be fully or partially funded by UNESCO or it may facilitate funds through different means (extra-budgetary)
    *   Encouraging and promoting research projects between countries that are sharing surface and underground water resources (transboundary water)
    *   Conducting training courses on different topics of IWRM and Ecohydrology for trainees from different countries in Africa to share knowledge and experience
    *   Providing information and documents about IWRM and Ecohydrology in Africa for free on UNESCO website, besides other means of dissemination
    *   Sponsoring seminars, workshops and conferences for exchange

WRM Component - Recommendations (3)

2. Providing study programs (Master and PhD degrees) in the field of water resources:

- Developing M.Sc. and PhD curriculums for IWRM and Ecohydrology as tools leading to upscaling African water security

- Providing scholarships for students from most poor countries in Africa

- Encouraging and partially sponsoring programs that provide curriculums of IWRM in African Universities

- Establishing networks for the different institutions working in fields of IWRM in Africa to encourage their cooperation and strengthen join research and training programs.

WRM Component - Recommendations (4)

The Inter-regional Workshop on South-South Cooperation proposed a Framework for Action for Upscaling IWRM and Ecohydrology in Africa. It identifies activities, deliverables, outputs/results, budgets, timeframes and partners necessary to deliver the nine key objectives:

i.   Capacity Building
ii.   Partnership and Networking
iii. Resource Mobilisation
iv.   Data Acquisition and Management
v.   Sensitization and Advocacy
vi.   Policies and Legislation
vii. Transboudary Programmes, Cooperation and Security
viii. Mainstreaming IWRM and Ecohydology in Water Education Curricula
ix.   Gender involvement

WRM Component - Recommendations (5)

The workshop Building Resilience to Climate Change Risk and Vulnerability to Meet Water Security Challenges recommended:

➢ Multi-level IWRM implementation starting from the community level leading to IRBM can provide paradigm shift in sustainable water management

➢ Accountable water allocation and use, closed water system, and tariffs could be explored as possible demand management and sustainability drivers

➢ Promoting energy efficient, cost-effective, environmentally friendly & socially acceptable technologies for water supply & wastewater management

➢ Water knowledge centres, universities and chairs are recommended, to gather and synthesis data and information from various stakeholders, advise policy makers, disseminate to communities, and engage the media

➢ Water knowledge centres and chairs should form strategic partnerships

➢ Enhance public awareness, and improve water education and participation to address climate-induced water security problems.

Collaboration among UNESCO Water-related centres in Asia-Pacific and Africa

and

some ideas for discussion

Partners in the *Upscaling Water Security to Meet Local, Regional and Global Challenges* project

The main project partners were (listed in alphabetical order):

➢ Malaysian National Commission for UNESCO

➢ Malaysian Water Partnerships

➢ Perbadanan Putrajaya

➢ Regional Centre for Integrated River Basin Management (RC-IRBM), Nigeria

➢ Regional Humid Tropics Hydrology and Water Resources Centre for South-East Asia and the Pacific (HTC), Kuala Lumpur, Malaysia

➢ River Engineering and Urban Drainage Research Centre (REDAC), Universiti Sains, Malaysia

➢ UNESCO Chair in Water Resources, Omdurman Islamic University, Sudan

➢ UNESCO IHP Malaysia

➢ UNESCO IHP Secretariat

Collaborators in the *Upscaling Water Security to Meet Local, Regional and Global Challenges* project

The following stakeholders also contributed significantly to the success of the project activities (in alphabetical order):

➢ African Ecohydrology Office, Ethiopia

➢ Asia-Pacific Centre for Ecohydrology (APCE), Indonesia

➢ Eco Development Facilities Sdn. Bhd

➢ International Centre for Water Hazard and Risk Management (ICHARM)

➢ National Water Resources Institute, Nigeria

➢ Regional Centre on Urban Water Management (RCUWM), Iran

➢ UNESCO Chair on Knowledge Systems for Integrated Water Resources Management, COMSATS Institute of Information Technology, Pakistan

➢ UNESCO Chair on Water Reuse, University of Tehran

➢ Universiti Putra Malaysia

➢ Other Malaysian universities who have contributed to the Water Management Curricula using Ecohydrology and IWRM publication, and supported workshops.

Some ideas for discussion

This project created a temporary platform for collaboration between UNESCO Water Chairs and Water Centres, universities and research centres, businesses and NGOs for exchange of scientific, technical and policy relevant information. In order to meet current and future challenges, there is an opportunity for longer term mechanisms to provide ongoing support for efforts to upscale water security in these regions.

➤ **Two** Category-2 Water-related Centres and **one** UNESCO Water Chair were partners in the project, and a further **three** Water-related Centres and **two** Water Chairs were contributing stakeholders.

➤ But, with **eleven** UNESCO Water-related centres and **thirteen** Water Chairs in the Asia-Pacific and Africa, there appears to be a substantial opportunity to increase their role in developing a coordinated response to water insecurity, in partnership with a wide range of other organisations and individuals.

A collaboration framework for upscaling water security in Asia-Pacific and Africa

❑ A Council of all Asia-Pacific and Africa Water Centres and Chairs could be established to provide an overarching framework for collaboration on upscaling water security in Asia-Pacific and Africa.

❑ The CWCC could be tasked with preparing a Strategic Plan for Collaboration Amongst UNESCO Water Chairs and Centres to Support Upscaling of Water Security in Asia-Pacific and Africa. The strategic plan could focus on the roles of each UNESCO Water Chairs and Water-related Centre, propose actions and timelines, and suggest funding strategies to support the network's collaborative efforts to upscale water security.

Supporting South-South Cooperation

This project has highlighted the important contribution that South-South Cooperation can make to upscaling water security in Asia-Pacific and Africa.

❑ UNESCO Water Chairs and Centres in Asia-Pacific and Africa could operate as a network of knowledge hubs for dissemination of information and collaboration with policy makers, scientists, universities and other research institutions, business, NGOs and others around water security in these regions. This could involve the formal establishment of strategic partnerships between UNESCO Water Chairs and Centres to address areas of common focus.

❑ A web-based Upscaling Water Security in Asia-Pacific and Africa Knowledge Platform could be established to support the ongoing function of UNESCO Water Chairs and Centres as hubs of knowledge and collaboration on water security in Asia-Pacific and Africa, and potentially globally.

Understanding Climate-induced Water Insecurity in Asia-Pacific and Africa

This project found that practical experiences of a variety of case studies in Asia-Pacific and Africa have the potential to generate a great deal of shared learning and better understanding.

❑ A collection of case studies could be developed and maintained to facilitate shared learning about experiences in upscaling water security in Asia-Pacific and Africa. All UNESCO Water Chairs and Centres in Asia-Pacific and Africa, and programmes such as Ecohydrology and HELP, could be asked to contribute case studies.

❑ The Upscaling Water Security in Asia-Pacific and Africa Knowledge Platform could be a primary mechanism to increase awareness and availability of the case studies, which may then be incorporated into water education curricula.

Capacity building for upscaling water security

This project identified several areas in which capacity is currently insufficient to address water security issues in the Asia-Pacific and Africa.

❑ A comprehensive assessment could be undertaken to enable a complete understanding of capacity building needs for upscaling water security in Asia-Pacific and Africa, with a particular focus on implementing Ecohydrology and IWRM approaches. Such a study could identify gaps in capacity to 2030, propose actions and timelines to address them, and identify potential funding strategies.

❑ Responsibility for the assessment could be allocated to an individual organization and be done in collaboration with all UNESCO Water Centres and Chairs in Asia-Pacific and Africa.

Education for water security

This project found that there is a shortage of water experts among educators. To build capacity in this area, it was proposed to move towards the HTC KL becoming a Water Education Hub to provide training, database sources and education linkages between universities and private sectors in water education.

❑ HTC KL could be developed as a Water Education Hub to provide training, database sources and education linkages between universities and private sectors in water education for the Humid Tropics in Asia-Pacific and Africa.

❑ If so, HTC KL could be requested by the proposed Council to make a comprehensive assessment of education needs for the Humid Tropics, in collaboration with all Water Chairs and Centres in Asia-Pacific and Africa.

Finalising the draft Synthesis Report

➢ Any immediate comments welcome now

➢ This presentation will be distributed for comments

➢ Email comments to me & Trita by 8 December please

➢ Final Synthesis Report to UNESCO Jakarta 15 December

➢ Report to be populated on UNESCO Jakarta website, Malaysia-UNESCO Cooperation Program website and IHP network dissemination channels

➢ Your input is important and very welcome!

Thank you / Terima kasih!

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