

Biennial Reports by UNESCO's Water-related Centres on activities related to the IHP in the period (June 2014 – October 2016)

**ASIA PACIFIC CENTRE FOR ECOHYDROLOGY (APCE)
UNESCO CATEGORY II CENTRE**

1. Basic information on the centre

Name of the Centre		ASIA PACIFIC CENTRE FOR ECOHYDROLOGY (APCE)
Name of Director		Associate Prof. Dr. Ignasius D.A. Sutapa
Name and title of contact person (for cooperation)		Associate Prof. Dr. Ignasius D.A. Sutapa
E-mail		ignasd@ yahoo.co.id
Address		Cibinong Sciences Centre - LIPI Jl. Raya Bogor Km 46 Cibinong 16911 Bogor - West Java - Indonesia
Website		www.apce-unesco.or.id
Location of centre		city/town CIBINONG country INDONESIA
Geographic orientation *		x <input type="checkbox"/> global <input type="checkbox"/> regional
Region(s) (for regional centres)		
Year of establishment		2011
Year of renewal assessment		
Signature date of most recent Agreement		March 2011
Themes Of activities during reporting period	Focal Areas ♦	<input checked="" type="checkbox"/> groundwater <input checked="" type="checkbox"/> urban water management <input checked="" type="checkbox"/> rural water management <input checked="" type="checkbox"/> arid / semi-arid zones <input type="checkbox"/> humid tropics <input type="checkbox"/> cryosphere (snow, ice, glaciers) <input checked="" type="checkbox"/> water related disasters (drought/floods) <input checked="" type="checkbox"/> Erosion/sedimentation, and landslides <input checked="" type="checkbox"/> ecohydrology/ecosystems <input type="checkbox"/> water law and policy <input checked="" type="checkbox"/> social/cultural/gender dimension of water <input type="checkbox"/> transboundary river basins/ aquifers <input type="checkbox"/> mathematical modelling <input checked="" type="checkbox"/> hydroinformatics <input type="checkbox"/> remote sensing/GIS <input checked="" type="checkbox"/> IWRM <input checked="" type="checkbox"/> Watershed processes/management <input type="checkbox"/> global and change and impact assessment <input type="checkbox"/> mathematical modelling <input checked="" type="checkbox"/> water education <input checked="" type="checkbox"/> water quality <input type="checkbox"/> nano-technology <input checked="" type="checkbox"/> waste water management/re-use <input checked="" type="checkbox"/> water/energy/food nexus <input type="checkbox"/> water systems and infrastructure <input type="checkbox"/> other: (please specify) _____
	Scope of Activities ♦	<input checked="" type="checkbox"/> vocational training <input type="checkbox"/> postgraduate education

* check on appropriate box
♦ check all that apply

	<input type="checkbox"/> continuing education <input checked="" type="checkbox"/> public outreach <input checked="" type="checkbox"/> research <input checked="" type="checkbox"/> institutional capacity-building <input type="checkbox"/> advising/ consulting <input type="checkbox"/> software development <input checked="" type="checkbox"/> data-sets/data-bases development <input type="checkbox"/> other: (please specify) _____
Support bodies ¹	
Hosting organization ²	INDONESIAN INSTITUTE OF SCIENCES (LIPI)
Sources of financial support ³	INDONESIAN GOVERNMENT
Existing networks and cooperation ⁴	National and International
Governance	<input checked="" type="checkbox"/> director and governing board <input type="checkbox"/> other: (please specify) _____ Link to election of board members to the IHP Intergovernmental Council (IGC) and hosting country IHP National Committee _____ Frequency of meetings: once every 1 year(s) <input type="checkbox"/> Existence of UNESCO presence at meetings
Institutional affiliation of director	INDONESIAN INSTITUTE OF SCIENCES (LIPI)
Number of staff and types of staff	total number of staff (full-time, or equivalent) : 10 number of staff who are water experts: 8 number of visiting scientists and postgraduate students: -
Annual turnover budget in USD	USD 200.000

2. Activities undertaken in the framework of IHP in the period June 2014 – May 2016

- 2.1 Educational activities (i.e., those with accreditation) that directly contributed to the IHP-VIII (Appendix 1) and WWAP
Please include here those activities which led to accreditation of degrees, or those held in formal school settings.
- 2.2 Research activities that directly contributed to the IHP-VIII activities
- Development of Ecohydrology Demosite in Saguling Reservoir, West Java
 - Promote research on ecohydrology approach for sustainable peatland management in ex-magarice project, Central Kalimantan
- Please include research/applied projects outputs such as publications that directly contributed to the IHP-VIII and WWAP objectives*
- 2.3 Training activities that directly contributed to the IHP-VIII and WWAP objectives
- IHP Training course hosted by APCE, November 8-9, 2014 in Yogyakarta
 - Training of Ecohydrology module for Secondary and High School in TTU, NTT, August and October 2016

3. Collaboration and linkages

¹ please specify bodies that cover the operational costs of the centre, and other essential costs such as salaries and utility bills, and that provide institutional support to ensure centre's sustainability

² if different from support bodies

³ please specify sources of main budgetary and extrabudgetary funds to implement projects

⁴ please write international networks, consortiums or projects that the centre is part of, or any other close links that the centre has with international organizations or programmes, which are not already mentioned above

- 3.1 Participation in major international networks, programmes, partnerships with other UN or other International Agencies, media and professional bodies
- 3.2 Participation in meetings related to the IHP and UNESCO (e.g. the UNESCO General Conference, the UNESCO Executive Board, the IHP Intergovernmental Council and/or other meetings organized by IHP)
- Ecohydrology Steering Committee Meeting in Paris May, 20 – 21, 2014
 - IGC Meeting of IHP in Paris June 2014
 - International Seminar on Landscape and Sustainable water resources management di Canberra Australia, June, 2014
 - International Water Diplomacy Meeting Koblenz – Germany, November 2014
 - World Lake Conference 2014 in September 2014, Perugia
 - Meeting of Indonesia Delegation with ILEC related to WLC16, 3 September 2014 di Perugia
 - World Water Forum in Daegu, Korea, in May 2015
 - Unesco Water Family Centres and Chairs Meeting in Kuala Lumpur, Malaysia, in March 2015
 - COP21 Meeting in Paris, December 2015
 - International Symposium of Ecohydrology in Lyon France, in November 2015
 - **THA 2015 International Conference on "Climate Change and Water & Environment Management in Monsoon Asia", Bangkok – Thailand, January 28-30, 2015**
 - Japan-Asia Youth Exchange Program in Science (Sakura Exchange in Sciences) (3rd -12nd March 2015)
 - International Summit on Water, Sustainable Development, and Healthy Life: Advancement of science and technology in Islamic World. Hosted by Secretariat for Advancement of Science and Technology in Islamic World (SASTIW), UCWR (UNESCO Chair for Water Reuse) and University of Tehran (Tehran, Tabriz, Isfahan, Iran 28 Feb-5 March 2016)
 - Unesco Water Family Centres Coordination Meeting in Beijing – China, May 2016
 - National Strategic Meeting on Water Security and SDG in Indonesia – UNESCO, Jakarta 13-14 April 2016
 - IGC IHP Meeting in Paris, June 2016
 - Meeting of IHP and MAB collaboration in Bali 2016
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- 3.3 Collaboration and networking with other UNESCO category 1 or 2 institutes/ centres
- 3.3.1 cross-appointment of directors of the category 1 or 2 institutes or centres on the governing board
- 3.3.2 exchange of information on activities such as training/educational materials, and funding opportunities
- Collaboration with ICHARM for IFAS training course held in Jakarta
 - Collaboration with Unesco Jakarta for promoting of Research and development of Ecohydrology Demosite in Saguling Reservoir, and Sustainable management of Peatland in Central Kalimantan
 - Collaboration wiith HTC Kuala Lumpur for promoting of implementation of IWRM
- 3.3.3 exchange of staff, most notably professionals and students
- 3.3.4 implementation of joint activities, such as workshops, conferences, training programmes, joint projects, field visits, software and data sharing, knowledge exchange and publications
- 3.4 Relationships with the UNESCO field and regional office whose jurisdiction covers the country of location
- 3.5 Relationship with the UNESCO National Commission and the IHP National Committee in the country of location and with other organizations of other countries

APCE-UNESCO contributes actively to IHP National committee activities.

- 3.6 Relationship with other UNESCO-related networks, such as UNESCO Clubs, ASPnet, and UNESCO chairs

4. Communication

- 4.1 Communication and knowledge dissemination activities undertaken in the framework of IHP

APCE-UNESCO actively promotes ecohydrology concept for water resources management to different institutions, communities such as Universities, Islamic Boarding Schools, Local Governments, NGOs, Televisions (CNN Indonesia, DAI TV)

- 4.2 Policy documents and advice

5. Update on Centre Operations

- 5.1 Membership of the Board of Governors between designated period
Governing Board of APCE:

- Prof. Dr. Iskandar Zulkarnain
- Dr. Zainal Arifin
- Prof. Dr. Soon Tak Lee (Korea)
- Prof. Dr. Takara (Japan)
- Prof. Dr. Quentin Grafton (Australia)
- Prof. Dr. Shahbaz Khan
- Prof. Dr. Hidayat Pawitan (Observer)

- 5.2 Key decisions made (attach minutes of meetings)

6. Evidence of the Centre's Impacts

- 6.1 Science Impacts (Major contributions to the science, technology, education, and regional and/or international cooperation in the field of water)

- 6.2 Knowledge Transfer Impacts (Major achievements in the dissemination of knowledge and technology transfer)

1. As host for Integrated Flood Analysis System (IFAS) course in collaboration with ICHARM, Unesco Jakarta Office and LIPI. The Asia and Pacific region, with different climate characteristics are at risk to hydro-meteorological hazards that often associated with extreme events. Some countries of this region are vulnerable to floods, and the annual flood losses are too high for any government to bear. Based on the framework of the Flood Forecasting and Warning System (FFWS) that conducted in ten countries (Australia, Cambodia, China, Indonesia, Lao P.D.R, Malaysia, Philippines, Republic of Korea, Thailand and Vietnam, a technical course was organized. The objective is to enable government agencies to the use of appropriate software (IFAS) for flood forecasting and warning system that leads in increasing capacity of managing water resources under climatic variability and the related extremes phenomena. The course implies the provision of national digital GIS data for the model creation at the target river basin as well as local hydrological/hydraulic data for run-off analyses and model validation
2. Promote and develop Demosite for Community Base Development on Water Management in collaborataion with UNESCO Jakarta Office, LIPI, University of Gajah Mada and Bogor Agriculture Institute. The objective of demosite for ecohydrology development is as a field station in relation to the implementation of ecohydrology concepts in the field. Demosite ecohydrology

campaign is expected to be material to socializing sustainable management of water resources in accordance with the concept of ecohydrology as well as a natural laboratory for the future development of the concept of ecohydrology especially that represents ecohydrology tropical Indonesian concern. Ecohydrology demosite development in Indonesia will be directed to a location demosite representing the concept of sustainable management of **water resources in several different groups, namely: "Demosite ecohydrology for the management of community-based on water resources"**.

3. As Host for International Conference on Ecohydrology (ICE) 2014 in Yogyakarta – Indonesia, in collaboration with UNESCO Jakarta Office, LIPI, UGM, Yogyakarta Special Region Province. This conference is in conjunction with the 22nd RSC Meeting of IHP. The objectives of the International Conference on Ecohydrology 2014 (ICE 2014) to synthesize information and knowledge gaps for addressing issues related to critical water environment systems. How the ecohydrology and ecotechnology could provide low cost environmentally sound technology for sustainable water management, especially in the Asia Pacific region. The Meeting **conclude by declaration: "The Yogyakarta Action"**
 4. As Host for IHP Training Course in November 8-9, 2014 in Yogyakarta – Indonesia, in collaboration with UNESCO Jakarta Office and LIPI. This training course focused on three major objectives : to share and/or acquire the latest methods of water and nutrients cycles restoration in river basin scale by using ecosystem properties as a management tool; to provide the understanding of the main ecological and hydrological processes occurring at the river basin; to discuss how the hydrological and ecological processes are affected by human activities and climate change, how they interact in time and space, and how Ecohydrology can help implement IWRM at the river basin level. Total participants were 29 participants coming from different countries, which consisted of 25 participants from Indonesia and Malaysia, Tokyo, Thailand, and Pakistan which were every country had a participant and from various affiliation.
 5. Promote and develop appropriate technology to provide clean water in marginal areas in collaboration with LIPI. IPAG60 : Alternative Technology to provide clean water in peatland area
 6. As host of National Workshop on Ecohydrology best practices for Sustainable management of water resources in Yogyakarta Special Region, 12 – 14 October 2016
 7. As host of National workshop on ecohydrology approach for sustainable management of water conservation in East Nusa Tenggara, in Kefamenanu 18 – 19 October 2016
 8. Inauguration of Ecohydrology Demosite Saguling, in Cililin, Bandung West Java, 29 October 2016
- 6.3 Policy Impacts (advice sought by government and other bodies and evidence of inputs into policy arena)

7. Future activities that will contribute directly to IHP and/or to WWAP

- 7.1 Operational Plan (attach if available)
- 7.2 Strategic Plan linked with IHP-VIII (Appendix 1). Focal areas within IHP-VIII the centre plans to contribute to and specific actions the centre will undertake to align its activities with the strategic plan for IHP-VIII

In order to support the IHP Phase VIII programs, APCE-UNESCO will focus to develop understanding and practices of ecohydrology through research, training and knowledge exchanges, information systems and public

awareness, mainly on theme 5 related to ecohydrology, engineering harmony for a sustainable world by :

1. Promoting local resources base ecohydrological research
2. Strengthening local capacity to adopt ecohydrological concept and approach
3. Providing easy access to local resources based ecohydrological information and knowledge
4. Enhancing public awareness of local resources based ecohydrological practices

APCE – UNESCO promote and develop collaboration with different institutions :

- UNESCO Jakarta Office
- ICHARM, Japan
- HTC Kuala Lumpur, Malaysia
- ANU & University of Canberra, Australia
- University of Queensland Australia
- Kyoto University
- ILEC, Japan
- UGM, Yogyakarta – Indonesia
- IPB, Bogor – Indonesia
- UNLAM, Banjarmasin, Indonesia
- University of Palangkaraya, Indonesia
- University of Timor, Indonesia
- University of Timor, TTU, NTT
- Ministry of Environment and Forestry
- Ministry of Public Work and Housing
- ICUWRM, Tehran – Iran
- UCWR, Tehran – Iran

8. Annexes

8.1 List of publications released by the centre (there can be overlap with those listed in 2.3 above)

No.	Author Name	Title
1	Tjandra Chrismadha	Phytotechnology Application for Enhancing Water Conservation: Use of Minute Duckweed (<i>Lemna perpusilla</i>) for Phytoremediator and Alternative Feed in a Water Closed Recirculation Aquaculture
2	Tri Suryono & Nina H. Sadi	Study of stratification on physicochemical properties and trophic state of Lake Tondano in North Sulawesi, Indonesia
3	Luki Subehi	Morphometric and hydrological conditions of tropical lakes in Malaysia and Indonesia
4	Muh. Fakhrudin	Erosion and runoff control at the catchment of Jatigede Reservoir using Ecohydrology
5	Awalina	Phytoplankton community abundance changes in urban lake under hypereutrophic conditions: A study case in Situ Rawa Kalong, Depok, West Java
6	Djamhuriyah S. Said	The environment suitability for freshwater shrimp <i>Macrobrachium sintangense</i>
7	Cynthia Henny	Treatment of palm oil mill effluent (POME) supernatant using combined subsurface and surface flow constructed wetland system

8	Iwan Ridwansyah	Ecohydrological modeling based sustainable basin management of Kracak Hydropower DAM, West Java
9	Reliana L. Toruan	Hydrological connectivity regulates zooplankton community shifting in two tropical floodplains: Lake Tempe and Lake Sentarum - Indonesia
10	Hidayat	Inundation mapping of the upper Kapuas wetlands using time series of radar images
11	Sulastri	Water quality and phytoplankton composition of lake maninjau, west sumatra, Indonesia
12	Triyanto	Analysis of water quality parameters for development of mud crab (<i>Scylla serrata</i>) silvofishery culture in Berau mangrove area, East Kalimantan
13	Siti Aisyah	Annual water quality condition of Cisadane downstream, West Java - Banten
14	Maria Yustiningsih	Induce mutation and in vitro selection for enhancing plant resistant of drought and salinity
15	Astried Sunaryani	The Optimization of Water Quality Improvement in Cijolang and Citanduy River through The Scenario of Wastewater Management System in Tapioca Starch Industry by using Fuzzy Goal Programming Approach (Case Study: Ciamis District, West Java)
16	Edy Prasetyo Utomo	The Role of ASRRG in response to drought and inundation
17	I G. A. Agung Pradnya Paramitha	DIVERSITY OF WATER MACROPHYTE WHICH BECOME THE HABITAT OF ORNAMENTAL FISHES IN LAKE SENTANI
18	Ignasius D.A. Sutapa	Potency of Cikeas River as Source of Raw Water for Drinking Water Treatment Plant

8.2 List of training courses conducted (there can be overlap with those listed in 2.1 above)

1. IHP Training Course in Yogyakarta, November 8 -9, 2014
2. IFAS Training Course in Jakarta, January 2014

Appendix 1

Overview of the Core Programme Themes of the Eighth Phase of the IHP (2014-2021) WATER SECURITY: ADDRESSING LOCAL, REGIONAL, AND GLOBAL CHALLENGES

THEME 1: WATER-RELATED DISASTERS AND HYDROLOGICAL CHANGE

- Focal area 1.1 - Risk management as adaptation to global changes
- Focal area 1.2 - Understanding coupled human and natural processes
- Focal area 1.3 - Benefiting from global and local Earth observation systems
- Focal area 1.4 - Addressing uncertainty and improving its communication
- Focal area 1.5 - Improve scientific basis for hydrology and water sciences for preparation and response to extreme hydrological events

THEME 2: GROUNDWATER IN A CHANGING ENVIRONMENT

- Focal area 2.1 - Enhancing sustainable groundwater resources management
- Focal area 2.2 - Addressing strategies for management of aquifers recharge
- Focal area 2.3 - Adapting to the impacts of climate change on aquifer systems
- Focal area 2.4 - Promoting groundwater quality protection
- Focal area 2.5 - Promoting management of transboundary aquifers

THEME 3: ADDRESSING WATER SCARCITY AND QUALITY

- Focal area 3.1 - Improving governance, planning, management, allocation, and efficient use of water resources
- Focal area 3.2 - Dealing with present water scarcity and developing foresight to prevent undesirable trends
- Focal area 3.3 - Promoting tools for stakeholders involvement and awareness and conflict resolution
- Focal area 3.4 - Addressing water quality and pollution issues within an IWRM framework - improving legal, policy, institutional, and human capacity
- Focal area 3.5 - Promoting innovative tools for safety of water supplies and controlling pollution

THEME 4: WATER AND HUMAN SETTLEMENTS OF THE FUTURE

- Focal area 4.1 - Game changing approaches and technologies
- Focal area 4.2 - System wide changes for integrated management approaches
- Focal area 4.3 - Institution and leadership for beneficitation and integration
- Focal area 4.4 - Opportunities in emerging cities in developing countries
- Focal area 4.5 - Integrated development in rural human settlement

THEME 5: ECOHYDROLOGY, ENGINEERING HARMONY FOR A SUSTAINABLE WORLD

- Focal area 5.1 - Hydrological dimension of a catchment– identification of potential threats and opportunities for a sustainable development
- Focal area 5.2 - Shaping of the catchment ecological structure for ecosystem potential enhancement – biological productivity and biodiversity
- Focal area 5.3 - Ecohydrology system solution and ecological engineering for the enhancement of water and ecosystem resilience and ecosystem services
- Focal area 5.4 - Urban Ecohydrology – storm water purification and retention in the city landscape, potential for improvement of health and quality of life
- Focal area 5.5 - Ecohydrological regulation for sustaining and restoring continental to coastal connectivity and ecosystem functioning

THEME 6: WATER EDUCATION, KEY FOR WATER SECURITY

- Focal area 6.1 - Enhancing tertiary water education and professional capabilities in the water sector
- Focal area 6.2 - Addressing vocational education and training of water technicians
- Focal area 6.3 - Water education for children and youth
- Focal area 6.4 - Promoting awareness of water issues through informal water education
- Focal area 6.5 - Education for transboundary water cooperation and governance