



Lessons Learned from Implementations of Ecohydrology Approach in Indonesia

Hidayat Pawitan, Ph.D. Engineering

Senior Research Fellow at the Asia-Pacific Center of Ecohydrology-Cibinong Bogor, INDONESIA

&

Professor of Water Resources Hydrology,

Bogor Agricultural University

Bogor 16680, INDONESIA

eMail> hpawitan@ipb.ac.id



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Introduction

- Indonesia water resources is relatively abundance with annual rainfall of about 2800 mm, however water availability for the different intensive uses, for domestic, industry and irrigated agriculture, is often in critical conditions that needs urgent resource management attention.
- Ecohydrology approach provides strong science based technology that has been introduced in Indonesia in the past decades at research and practical levels.

Indonesia Water and Environment Resources

- **Land resources:** 1,91 Mkm² with 17 000 islands (1,3% of world's land surface) that contains 10% of world's plant species, 12 % of mammal species, 16 % of reptiles and amphibians, and 17% of bird species; land use and cover changes;
- **Forest resources:** 144 Mha (~74%) with 109 Mha forest cover; 18,8 Mha conservation forest; 30,3 Mha protection forest; 64,4 Mha prod forest; 30,5 Mha conversion forest; Deforestation rate: 0,3 Mha/yr in 1970's to 3,8 Mha/yr in 2000, but about 1.0 Mha/yr at present;
- **Water resources:** components of runoff cycles;
- **Environment resources:** air, water, wetlands, wildlife, esthetics, as well as toxic & hazardous wastes. Some consequences: increase GHG, global warming, sea level rise;
- **Knowledge resources:** Science and Technology, including local/traditional wisdoms.



Recent changes of Indonesia Forest Resources (interpretation from landsat images) :

- ***Degraded forest land is 59,62 million ha.***
 - ***Deforestation rate is 1,09 million ha /annum (2000-2006).***
 - ***Degradation was severe and un-controlable especially during reformation/autonomous era, as permit was not acknowledged, illegal logging, forest encroachment and conversion to other uses***
- (Source: Forestry Department, 2008)



Implementations of ecohydrology approach in Indonesia

- **Ecohydrology theory and concepts provide integrative science solution of IWRM** to ensure sustainable water resources development that **have been introduced in Indonesia in the past decades with some implementations on various cases**, however in present practices there are still big gaps between theory and reality that need to be resolved;
- Some National Programs involved IWRM



National Programs related to the Water Resources development:

- (i) **GN-KPA** – national movement on partnership for safeguarding of water resources;
- (ii) **GN-RHL** – national movement for land and forest rehabilitation; and
- (iii) **National Program on Integrated Agricultural Management Field School**, or
- (iv) from more sectoral programs, such as:
 - ESP – Environmental Services Program, a project under Department of Forestry supported by US Agency for International Development;
 - SCBFWM - **Strengthening Community-Based Forest and Watershed Management In Indonesia**, a pilot project under Department of Forestry supported by UN Development Program; and
 - P4MI – **Poor Farmers Income Improvement through Innovation Program**, a pilot project under Department of Agriculture that is supported by Asian Development Bank.
- (v) Etc.



LESSONS LEARNED – Water Resources Development Strategy

WATER RESOURCES CONSERVATION

(new paradigm of integrated water resources
management)



SOIL CONSERVATION



REFORESTATION/REGREENING PROGRAM

(ecohydrology and phytotechnology approaches)



CONCLUDING REMARKS:

- (i) Water environment under stress rooted from population pressures and anthropogenic activities to land use changes and water demands that have threatened national water security;
- (ii) Ecohydrology approach provides science based National Programs in sustainable water resources development in Indonesia; and
- (iii) Sustainable water resources development strategy that ensure **conservation of water resources**, through national movements of **reforestation and greening program** can be expected to prevent and rehabilitate **soil erosion and land degradation**, and these are implemented through community development activities.





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