INTEGRATING ECOHIDROLOGY INTO SYLLABUS IN EAST NUSA TENGGARA:
LESSON LEARNED, IMPACT AND RECOMMENDATION

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Background

- Water scarcity is common problems in the East Nusa Tenggara Province.
- Most of 22 districts in East Nusa Tenggara experiencing drought and lack of clean water due to the short rainy season
- Average of rainfall 1418 mm / year
- Many policies and community activities not support good water management and intensify with community behaviour that unconcerned with water resources and environment management
- It is necessary to integrated and interlinking water education program into formal education in middle school
- Integrate ecohidrology concept in middle school level
Ecohydrology in school level

IHP VIII

Water education, key for water security

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

Manage environment

Education

Manage water resource
Enhance the contribution

Source : Unesco Indonesia
Ecohidrology

Ecohidrology known as new approach to regulate ecology and hydrology component to support water security and sustainability

Objectives:

- Describe how the ecohydrology concept can be integrated into the syllabus in schools level
- Identify the impact and lesson learned of this integration to school and student perceptual change.
Integration Process

1. Identify of participants (teachers) and their background
2. Design workshop materials adapted to semi-arid land
3. Transfers ecohydrology concept to teachers through serial workshops
4. Develops draft syllabus adapted to the level of students' comprehension at the middle school
5. Identify school subject to integrate the ecohydrology concept
Workshop and Integration

• Developing 13 variations of draft syllabus.

• Teachers has innovation to simplify the concept of dual regulation into interaction between biotic and abiotic ecosystem component; ecosystem and hidrology interaction

• Local context example: biodiversity in semi-arid land and focus on human and their important role protecting ecosystem and the environment

• The terminology of blended curriculum (EBC) is used since the ecohydrology concept integrate into existing school subjects
Model peragaman/diversifikasi kurikulum

Warna Kurikulum

- Warna maritim dalam kurikulum
- Warna agraris dan lingkungan dalam kurikulum
- Warna niaga/jasa dalam kurikulum

Sources: Pusat Kurikulum dan Perbukuan Nasional
Ecohydrology syllabus in high school

- Contains learning method and plan, basic competencies, indicators and type of student assessment adjusted with middle school level comprehension
- Teacher translate ecohidrology concept into 4 basic principles of teaching: teaching method, psychology principle, logical and consistency, and conformity between the teaching purpose and valuing

(Anderson, 2001)
• Teaching principle refer to systematic teaching method
• Psychology principle and logical consistency refer to student capacity to absorb local example which induces response
• Student living in semi-arid area will easier understand if they give relevant example of these ecosystem rather than aquatic ecosystem
• The relevant example also will facilitate teaching purpose and assessment or valuing
Develop syllabus

• Teacher designed a syllabus refer to the level of students' comprehension in absorbing the dual regulation theory

• Using Bloom taxonomy: cognitive domain (receiving, responding, valuing, analysis and evaluating); and affective domain (duplicate, articulate and characterization).

• Comprehension initiate analysis and valuing, duplicate initiate articulating and develop their character (Samsudin, 2012)
Result

• Student comprehension has improved from simply receiving and responding to being articulate and encouraging (37%)

• At the affective domain students want to contribute actively conserving water in their environment, using water efficiently, and will transfer this knowledge to their environment

• The improvement of knowledge transfer from cognitive level to affective and psychomotor indicated that students have absorbed and be able to articulate their knowledge (Widodo et al, 2009)
Impact

• Student want to contribute actively conserve hydrological component
• Action plans
• School has developed waterways used to hold humus to make green school environment while regulating hydrology components
Lesson learned

• Involving Local Education Department. Consultations and asking for permission will strengthens the program

• Consultation with National Curriculum Center. Inviting the head of the National Curriculum Center to deliver enlightenment about flexibility and curriculum diversification by appending local important materials.

• Give opportunities and flexibility for teachers to be creative in developing syllabus and learning materials adjusted with school environment.
Ecohidrologi in school level

- Determine the level of cognitive-psychomotor student comprehension. Ecohidrology needs to be translated using appropriate cognitive-psychomotor concepts.

- Adjustments concept ecohidrology into local phenomenon and context. Providing examples of aquatic ecosystem where water resource easily access incompatible with conditions and unpropriated for the beneficiaries.
Conclusion

• Ecohydrology concept can be integrated into existing school subjects.

• These concepts can be taught at the formal level in high school with local context example
Recommendation

• To support Ecohidrology syllabus at school it is necessary to strengthen teachers and schools who implemented this program.

• Modul development can be used to strengthen the program.
Ecohidrology Project in University of Timor

• After curriculum revision 2016 : Adopted Ecohidrology as mandatory subject in Biology Department of University of Timor
• Faculty of Education : curriculum combine theory and application
• Introducing ecohidrology into local government; Local Institution
• Regularly conduct small project competition among students
• 6 small proposal support by Unimor

Currently proposal focus :
• Bioremediation for organic liquid waste and plant biomass
• Fitoremediation and Domestic liquid waste
• Designing simple management of domestic liquid waste in University
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Thank You
Terimakasih