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Ecosystem-based Adaptation in Catchment Management in Thailand, Asia

From local wisdom to state-of-the-art tools – Integrated planning of EbA measures

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Outcome: The responsible authorities prevent increased flood and drought damage through the implementation of ecosystem adaptation measures in the catchment areas of Thailand

Expected Results:

- 1. The local water departments of the Huai Sai Bat, Lam Pa Chi and Tha Di basin plan ecosystembased adaptation measures for the protection against the effects of extreme events based on data and with the involvement of relevant stakeholders (pilot river basin level).
- 2. Ecosystem-based adaptation measures for the prevention of flooding and drought are implemented in the pilot catchments (pilot river basin level).
- Project experience gained from the pilot catchments 3. is fed into the national adaptation strategy for the water sector (national level).
- 4 Staff of the relevant national water authorities is able to design and evaluate ecosystem-based adaptation measures for the prevention of floods and droughts (national level).



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ECOSWat

Approach:

- three pilot watersheds threatened by the impacts of climate change – vulnerability assessment
- Guidance of relevant professionals (government, universities) – cooperation & involvement
- Inclusion of Thai population through stakeholder platforms – integration of local wisdom
- Implementation of innovative EbA approaches for demonstration purposes – monitoring system
- Anchoring of EbA education and training formats in pilot watersheds and national level – university, vocational
- Comprehensive, cross-sector approach land use, forest, food processing, water quality (sewage)







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On behalf of:

- Module 1 Getting started
 - Stakeholder analysis
 - Analysis of the capacities
 - Geographical scaling
 - understand the context in which the assessment is taking place (Step 1),
 - define clear objectives and expected outcomes for the assessment (Step 2),
 - determine the thematic, spatial and temporal scope of your vulnerability assessment and outline potential methods (Step 3), and
 - prepare an implementation plan that defines tasks and responsibilities for different participants and stakeholders, as well as the schedule for the vulnerability assessment, taking into account available resources (Step 4).

Geographical Context

- Three pilot sites
 - Northeast Khon Kaen dry, agricultural area
 - South Nakhon Si Tammarat wet, agricultural area
 - New: West of BKK: Lum Pha Chi-wet, agricultural area

- 1. Delineation of the area of interest
- Identification of main features 2.

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Localization з.



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On behalf of:

Scoping

Involvement of

- Local universities
- Local communities
- Local wisdom
- RBC
- Private sector
- Local government

- Bilateral talks
- Group discussions
- Political talks
- Business talks
- Private sector
- Local government
- Survey
- Mapping



Module 2 Developing Impact Chains

- Survey among stakeholders about potential impacts, climate change exposure and determine sensitivity (Step 1, 2, 3)
- Analysis of the capacities
- Workshops about EbA, Study Tour to Germany

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Vulnerability Assessment

- Step 1:
 - Identify potential impacts
 - Which direct and indirect impacts are relevant for the vulnerability assessment?
- Step 2
 - Determine exposure
 - To which changing climate signals is your system exposed?
- Step 3
 - Determine sensitivity
 - What characteristics make your system susceptible to changing climate conditions?

Flooding:

- Inadequate compensatory measures
- **Relocation of problems**
- . Inundation and damage to human life and property (downstream)
- Response costs for extreme events (downstream)
- Loss of well-being, increase of fear and uncertainty
- Unequal treatment

Freshwater shortage:

- Reduction in options for future use ٠
- Loss of agricultural uses



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On behalf of:

- Module 2 Developing Impact Chains
 - Step 4
 - Determine adaptive capacity
 - Which adaptive capacities allow your system to handle adverse climate change impacts?
 - Step 5
 - Brainstorm adaptation measures (optional)
 - What measures could help increase adaptive capacity and decrease sensitivity in the system?





- Module 3 Identifying and selecting indicators
 - Consultation with external national and international experts
 - Capacity indicator (EbA training in Thai)
 - TORs for VA



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On behalf of:

- Module 3 Identifying and selecting indicators
 - Step 1
 - Selecting indicators for exposure and sensitivity
 - How do I assess the exposure and sensitivity components of the impact chain?
 - Step 2
 - Selecting indicators for adaptive capacity
 - How do I assess the adaptive capacity components of the impact chain?
 - Step 3
 - Check if your indicator is specific enough
 - Step 4
 - Create a list of provisional indicators for each factor
 - How do I generate a list of indicators with key information about content and data requirements?

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- Module 3 Identifying and selecting indicators
 - Joint-Study conducted by International and Thai experts on Vulnerability Assessment
 - Workshops organized to present of results of the studies and select the most suitable measures
 - Organizational Capacity Development Analysis conducted to identify the need and the understanding level on EbA from the partner institutes
 - EbA and Economic Evaluation Training for more than 200 staffs from Thai partner institutes
 - Mid-term Review to steer the activities to meet mutual goals







On behalf of:

- Module 3 Identifying and selecting indicators
 - Integration of Drones into Water Sector:
 - ECOSWat organized 2 consecutive workshops to introduce the integration of drones into water sector
 - Curriculum development in Thai at Walailak University regarding integration of drone into water sector







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Module 4 Data acquisition and management

- Consultation with external national and international experts
- Data request
- Quality check
- Data management (Data server)



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On behalf of:

- Module 4 Data acquisition and management
 - Step 1
 - Gather your data
 - What kind of data do you need?
 - Who can provide the data?
 - Step 2
 - Data quality check
 - Are the data in the format you expected? Are all the files legible and ready forfurther processing?
 - Step 3
 - Data management
 - How are data transformed into relevant, readable formats?
 - How do you structure and compile your data in a common database?
 - How can you document your data with metadata and/or data fact sheets?





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Module 5 Normalisation of indicator data

- Consultation with external national and international experts
- Elaboration of a work plan
- Evaluation of the work plan



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On behalf of:

- Module 5 Normalisation of indicator data
 - Step 1
 - Determine scale of measurement
 - What scales of measurement do my indicators use?
 - Am I dealing with multiple scales?
 - Step 2
 - Normalise your indicator values
 - How do I normalise metric data into values between 0 and 1?
 - How do I normalise categorial data into values between 0 and 1?











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• Module 6 Weighting and aggregating of indicators

- Technical assessment
- Economic evaluation
- Land availability



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On behalf of:

- Module 6 Weighting and aggregating of indicators
 - Step 1
 - Weighting of indicators
 - Are some indicators and vulnerability components more important than others?
 - How are different weighting factors defined?
 - Which methods can be used to define weights?
 - How should weighting factors be applied?
 - Step 2
 - Aggregation of indicators
 - How do I combine several indicators into a composite indicator representing a vulnerability component?
 - How should indicators be aggregated?
 - What are the pros and cons of a composite indicator?

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Huay Sai Bat

On behalf of:

Lum Pa Chi

Tha Di



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Module 7 Aggregating vulnerability components to vulnerability

- Exposure and Sensitivity
- Technical and economic evaluation



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On behalf of:

- Module 7 Aggregating vulnerability components to vulnerability
 - Step 1
 - Aggregation of exposure and sensitivity to potential impact
 - How do I combine the two vulnerability components exposure and sensitivity to a potential impact?
 - Step 2
 - Aggregation of potential impact and adaptive capacity to vulnerability
 - How should the two vulnerability components potential impact and adaptive capacity be combined to form a composite vulnerability indicator?
 - Step 3
 - Aggregation of several sub-vulnerabilities to an overall vulnerability
 - How do I combine several sub-vulnerabilities into a single overall vulnerability?
 - How useful is such a highly aggregated vulnerability value in identifying suitable adaptation measures, for instance?



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• Module 8 Presenting the outcomes of your vulnerability assessment

- Report submitted by expert Quality check with GIZ team
- Consultation with partners
- Workshop
- Public hearing



River bank erosion co River bed enhanceme

Constructed Wetland

Riparian zone developmen

1 River bed

restoration

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On behalf of:

Possible Ecosystem-based measures

River bank ero

2 Wetland

hancement

5 Constructed Wetland (small size)

Vulnerability Assessment

Module 8 Presenting the outcomes of your vulnerability assessment

List of major concerns

Tha Di River Basin

Erosion (deforestation)

Discharge of wastewater (5)

Discharge of nutrients (3, 4)

Erosion (river bank erosion) (3)

Flood (Land use planning) (1, 2)

- Step 1
 - Plan your vulnerability assessment report
 - What did you learn from the assessment?
 - Who is your targe
 - What information
- Step 2
 - Describe your as:
 - What's the best w
 - What processes \
 - What have you le
- Step 3
 - Illustrate your finc
 - How should you illustrate your manage:



4 Riparian zone

(buffer strips)

+

3 Bank

erosion

control

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Cause – effects Deforestation Mountainous area



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Monitoring with Drones

New perspective





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On behalf of:

Monitoring with Drones

What do we use drones for?

- Surveillance of areas we cannot reach
- Modelling 2 and 3D models
- Data collection
- Monitoring of water infrastructure
- Visualization of effects
- Integrated approach
 - Water modelling
 - Loss and damage
 - (Early warning system)



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Living weirs







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On behalf of:

Living weirs





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Thank you very much for your attention

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