

ASEAN - Netherlands Cross Learning Event

*The Nature-based Approach and examples from
the Philippines*

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29 September 2026



Contents

- What could possibly go wrong in implementation?
- EcoShape
- NbS & Nature-based Approach
- Enablers / blockers

- **Case-work Part 1:** System understanding

- Example of system understanding and potential solutions from the Philippines

- **Case-work Part 2:** Potential solutions

What could potentially go wrong?

Philippines examples



- How old do you estimate this embankment?
- Do you consider it to be safe and effective?

Philippines examples



- 2 main reasons for premature failure

Philippines examples



Philippines examples



Philippines examples



Fragmented solutions



Fragmented solutions



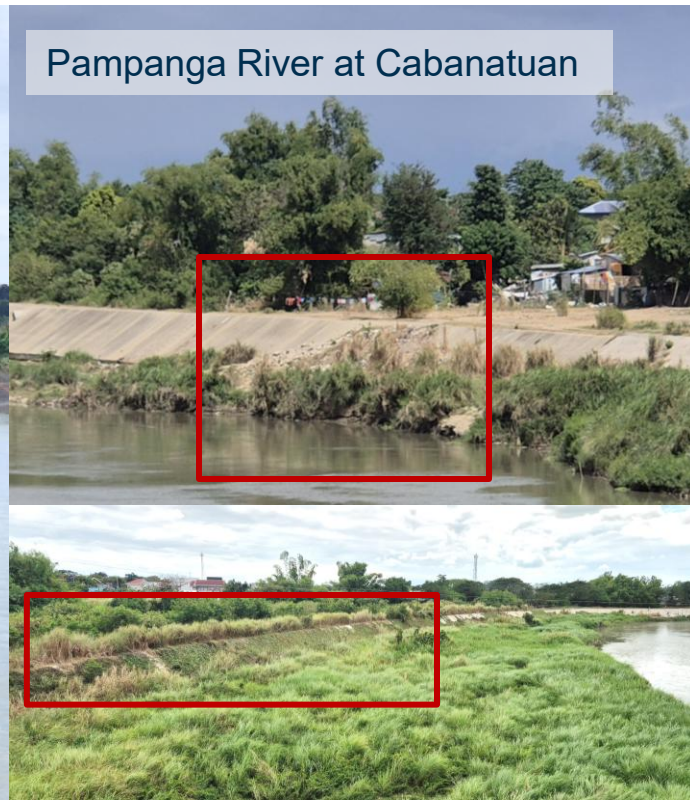
Embankments require inspection & maintenance

Nearby Cong Dadong Dam

Caused by vegetation growth



Pampanga River at Cabanatuan





EcoShape

We are part of the EcoShape family



Founded in 2008, brings together knowledge institutes, practitioners, government, NGOs



EcoShape – Building with Nature

- Precompetitive knowledge development
- Through “learning by doing” – pilot projects
- Brings together knowledge institutes, engineering, government, contractors, NGOs
- Collaboration between environmental, social and technical sciences
- Translated into practical design guidelines
- Shared with community



What are nature-based solutions?

Nature-based approach

- **Approach:** Understand & use the power of natural processes
- **System understanding:** Abiotic, biotic, social, stakeholders, financial
- **Result** = integrated and adaptive solutions



Solutions can be grey, green and hybrid

Grey
Traditional Engineering

Green Grey

Nature-based / Green Grey Solutions

Hybrid

Prompted recovery

Natural / Green
Natural

NbS for Coastal Space for Water & Storm Management

Fully grey solutions

Engineered infrastructure to defend against waves and store surge water.



Green grey solutions

Add coastal vegetation elements to engineered defenses to reduce impact and enhance space.



Hybrid solutions

Traditional engineering fronted by a created nature feature (e.g. sea dike fronted by mangroves).



Prompted recovery

Restore natural processes and reclaim coastal space for water and ecosystems.

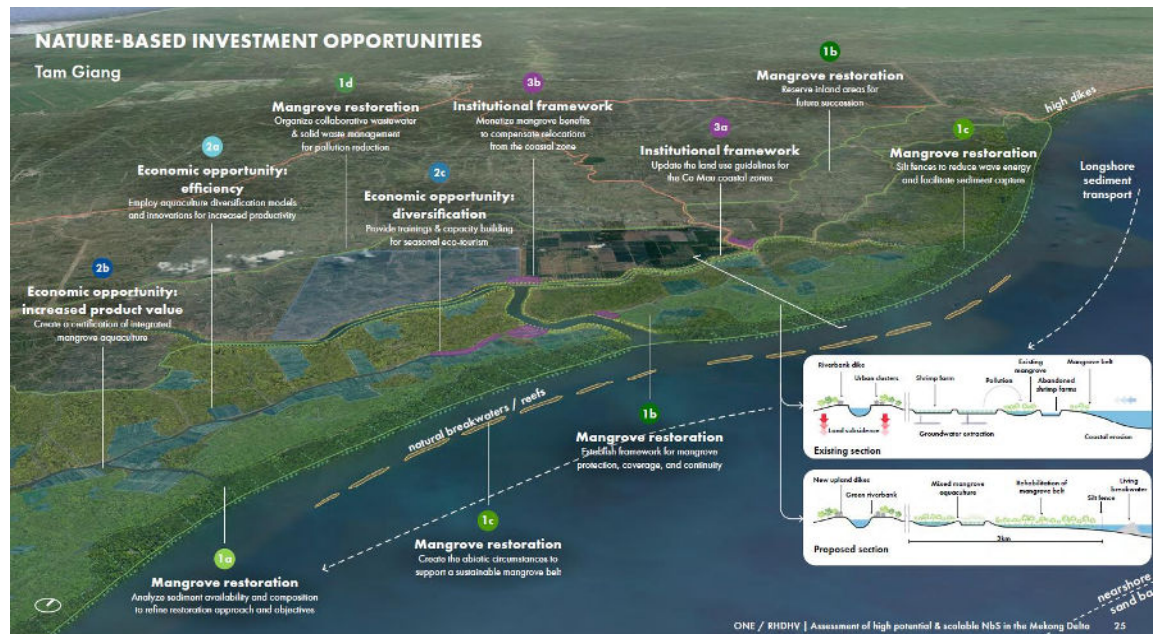


Fully natural / green

Original landscape before development – naturally occurring systems that support water and biodiversity.



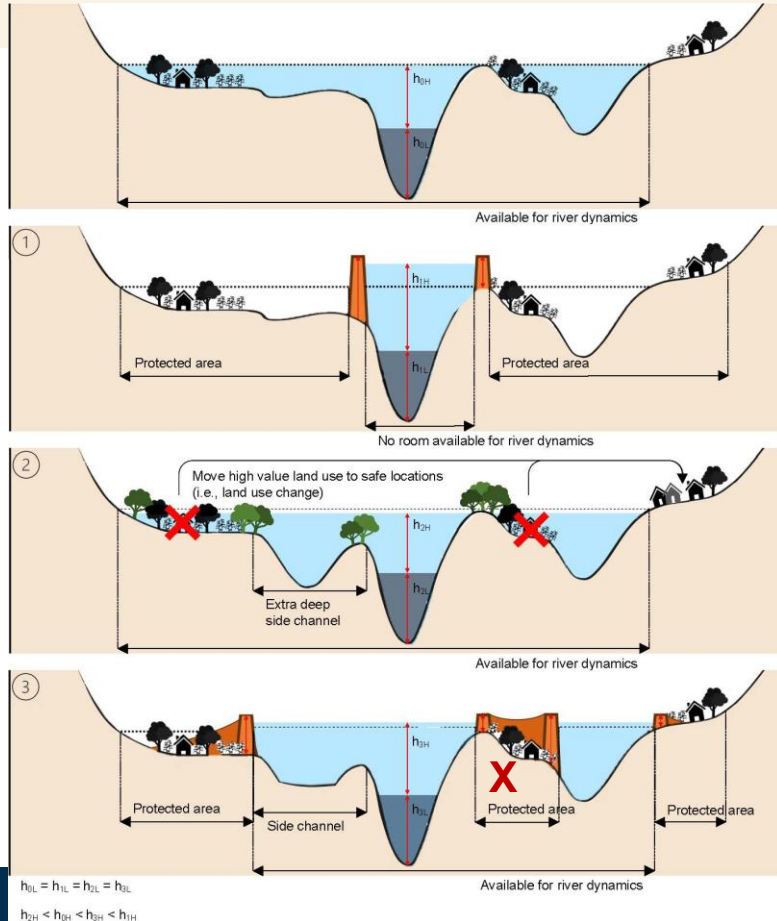
Solutions can be small and large



Landscape scale – Example Mekong Delta (One Architecture and RHDHV)
Focus on many stresses and challenges

Small scale (add on)
Often focus on a single or few stresses and challenges

Various options for flood mitigation



- Baseline Condition
- Protect Everything
- Move people and developments away from the floodplain
- Combination of protection measures/relocation

Philippines: shift in river basin management

Without Room for the River

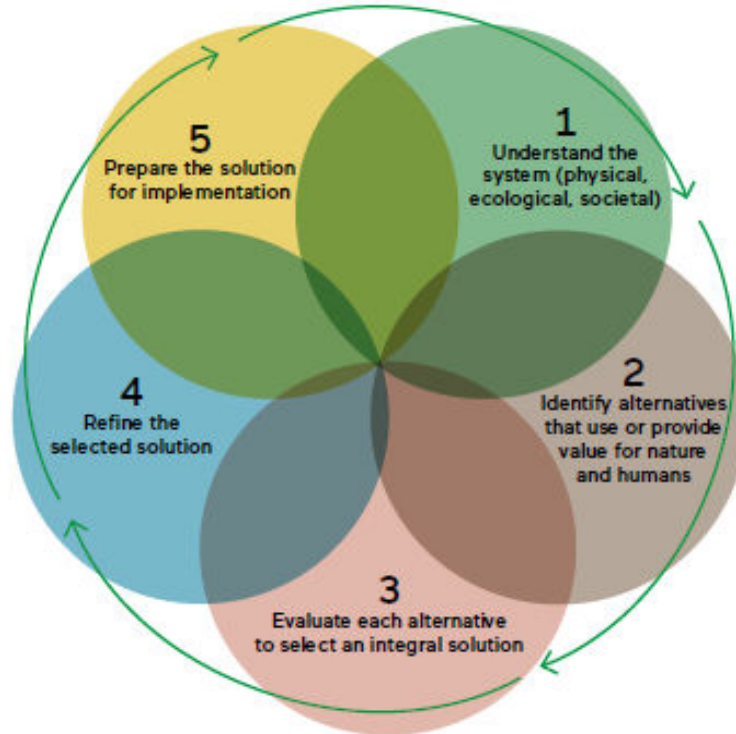


With Room for the River



- + Lower water levels + flow velocities
- + Lower embankments
- + No sheet-pile needed
- = More sustainable solution

How to follow a NBS approach?



Aligns with steps
of the design
process

<https://www.ecoshape.org>

The five Building with Nature design steps

Enablers / Blockers

Building with Nature - Enablers

Technology and system knowledge



Multi-stakeholder approach



Management, monitoring and maintenance



Institutional embedding



Business Case



Capacity building



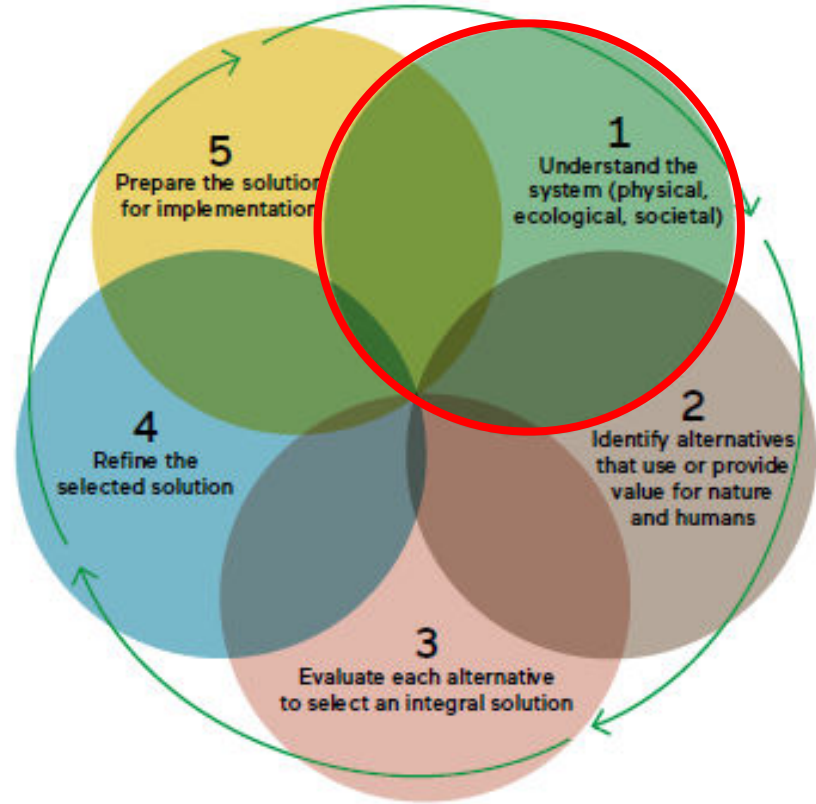
Building with Nature - Enablers



Work on case studies Part 1

Working on our cases

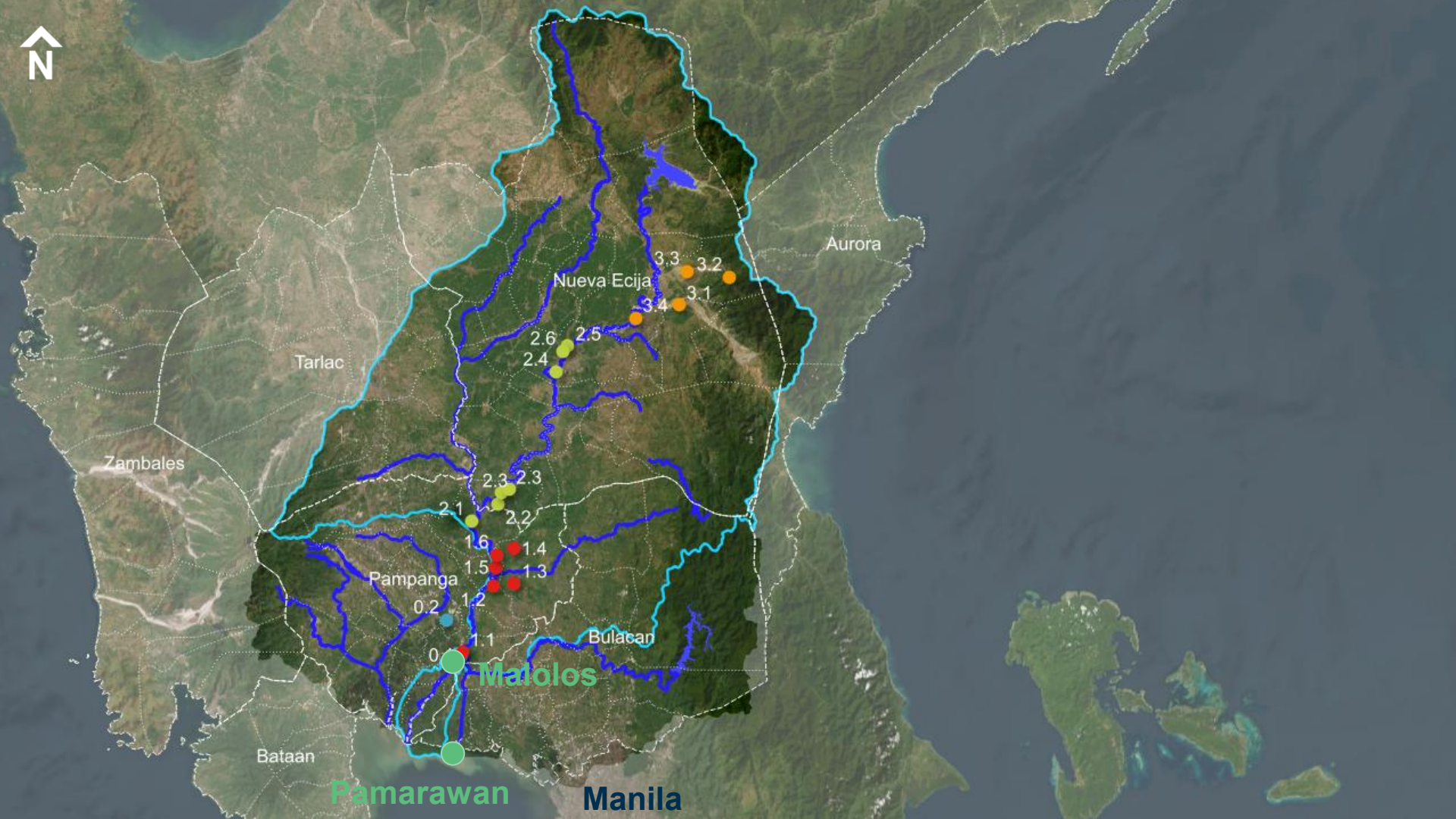
Technology and system knowledge



Working on our cases: guiding questions

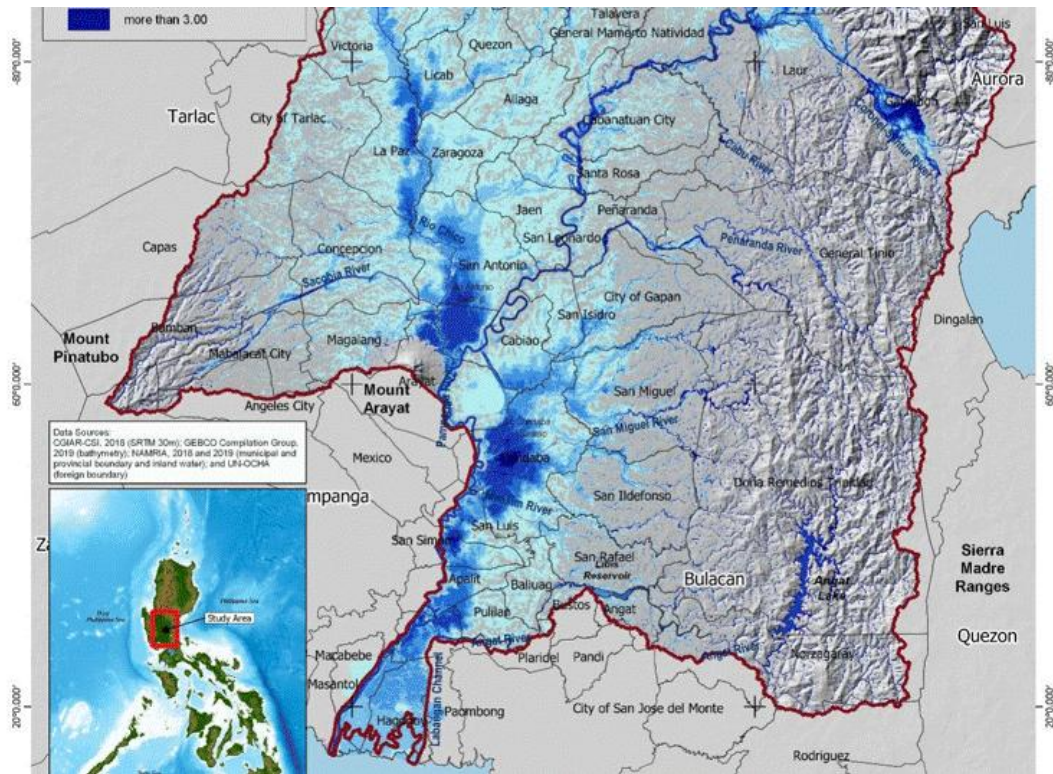
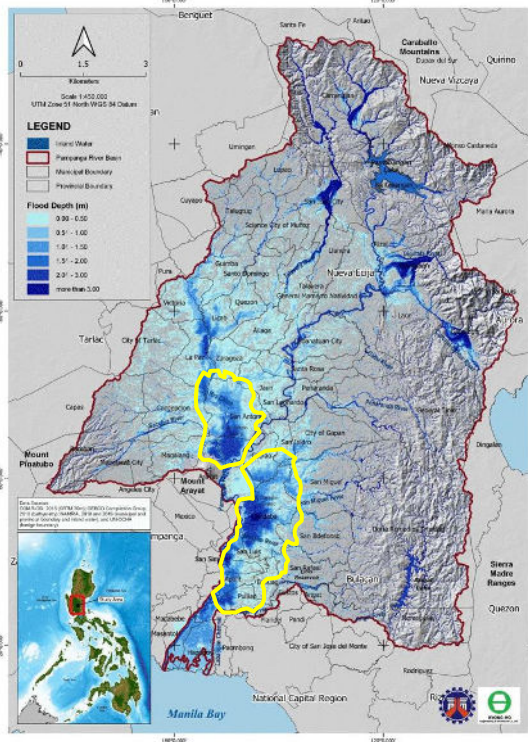
- **What drives the current situation?**
What is the problem? Who is affected? Where? When?
- **How does the physical system work?**
How do water, land, geology, ecosystems and settlements interact?
- **What are the natural processes at play?**
Think of climate (T, Wind, Rain), ecosystem (services), air/surface/subsurface
- **How do people interact with the system?**
Who depends on the water and land, and how do people use or change them?
- **Who influences the system?**
Who uses, manages and makes decisions about the water and land?
- **Where is the system changing?**
What changes have occurred in the past? Gradual, or distinct in time? Can you identify the cause? Are there future pressures or changes that could alter the system unfavourably?

Examples from the Philippines



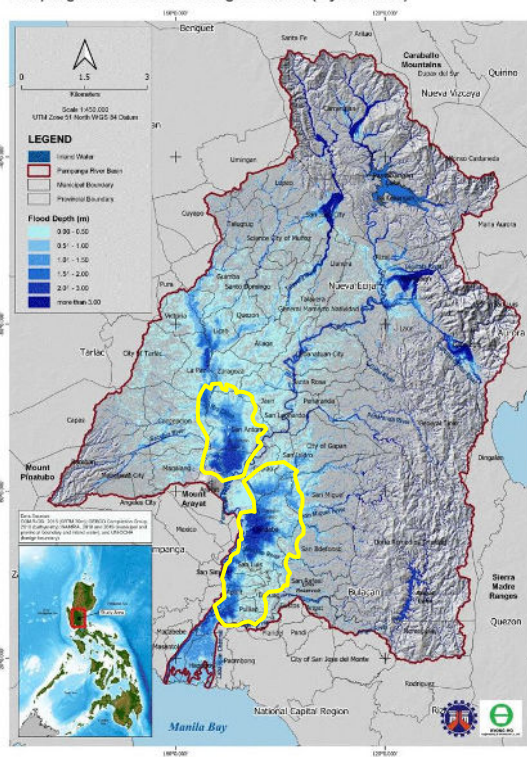
Pampanga River Basin (PRB) Flood Risk Context

Pampanga River Basin: Existing Condition (2-year Flood)

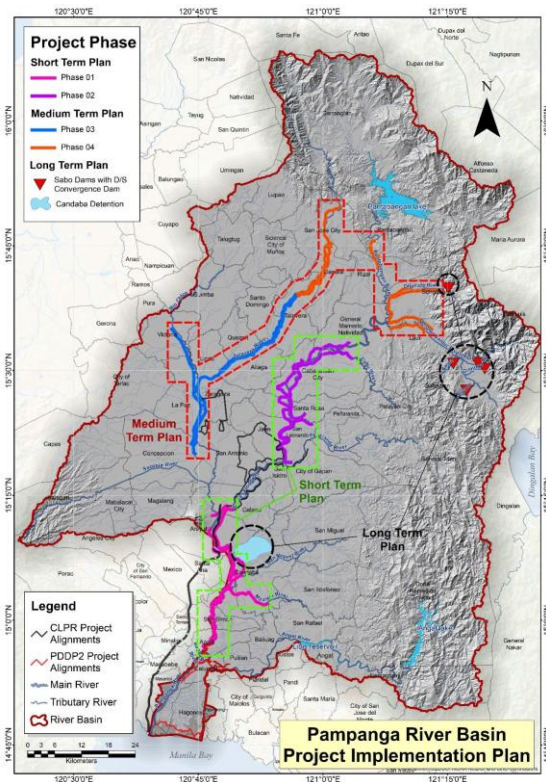
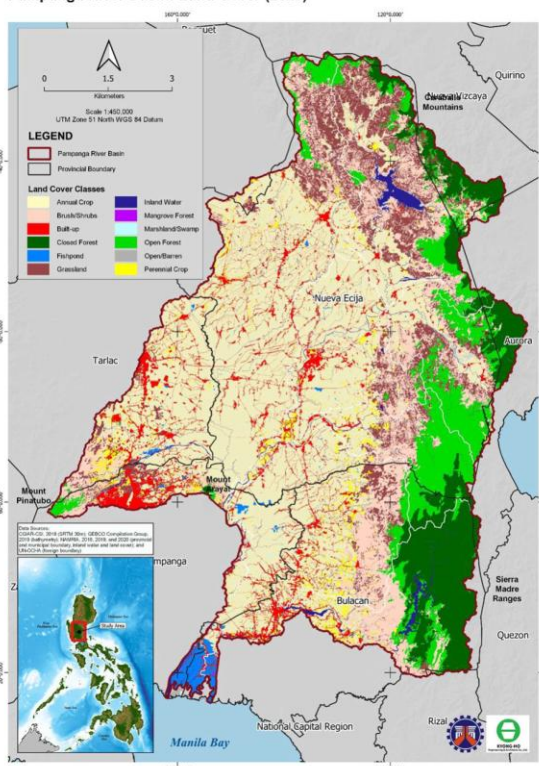


Pampanga River Basin (PRB) Flood Risk Context

Pampanga River Basin: Existing Condition (2-year Flood)



Pampanga River Basin: Land Cover (2020)



Masterplan Interventions

1. Construction of New Dikes

2. Sluices/Culverts

3. Detention Basin

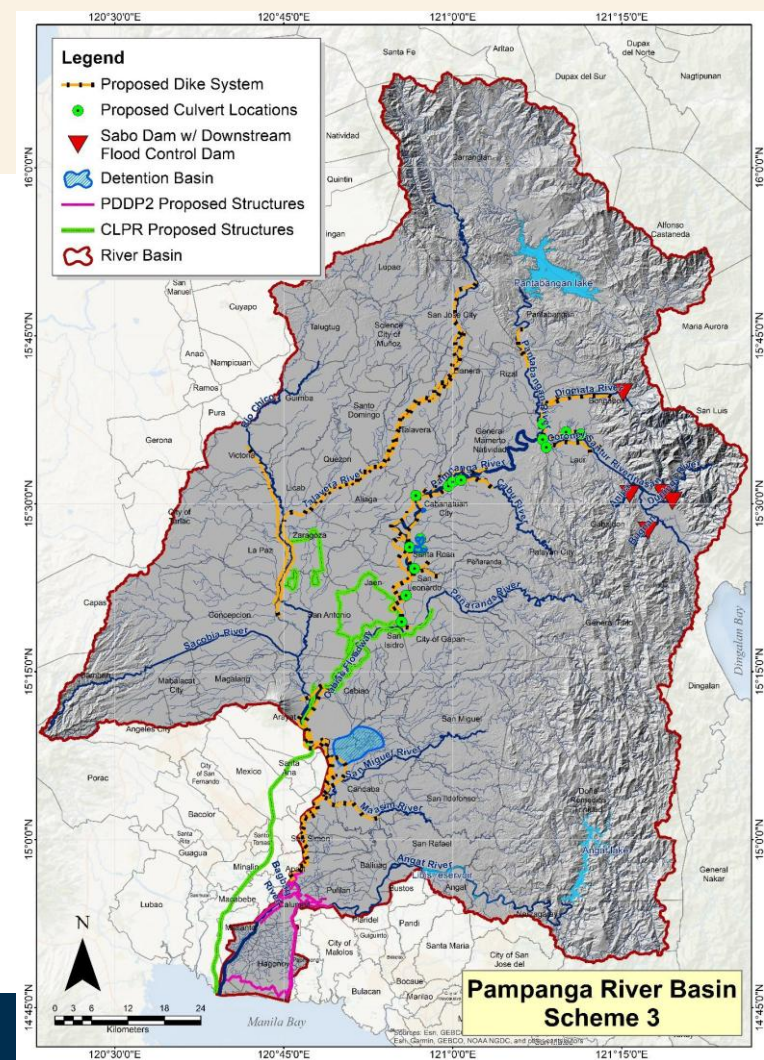
- Candaba Swamp
- San Antonio Swamp

4. Convergence Dams

5. Sabo Works

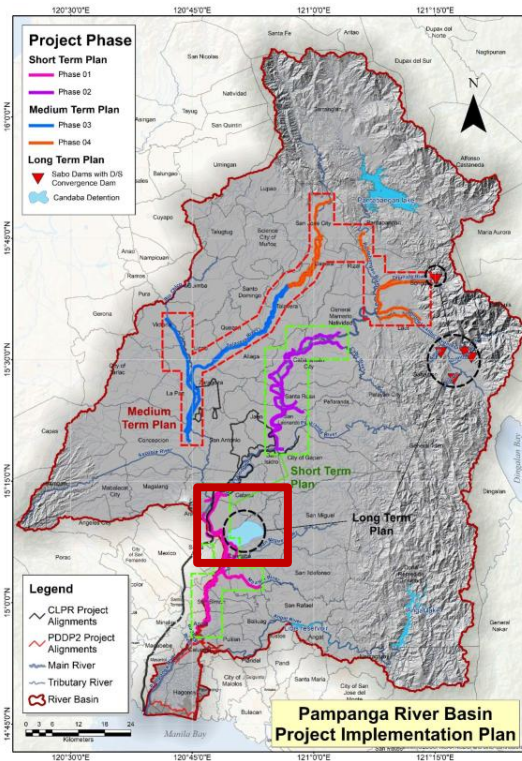
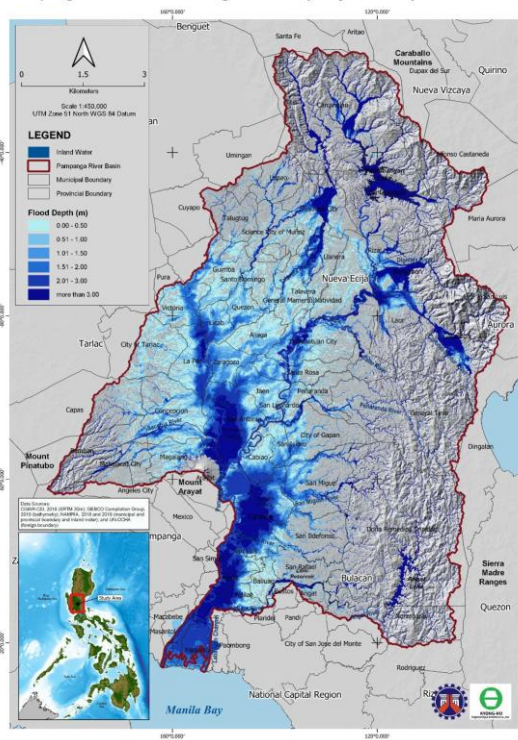
Observations:

- The proposed solutions are all grey
- How do they integrate ecology, subsidence, livelihoods?

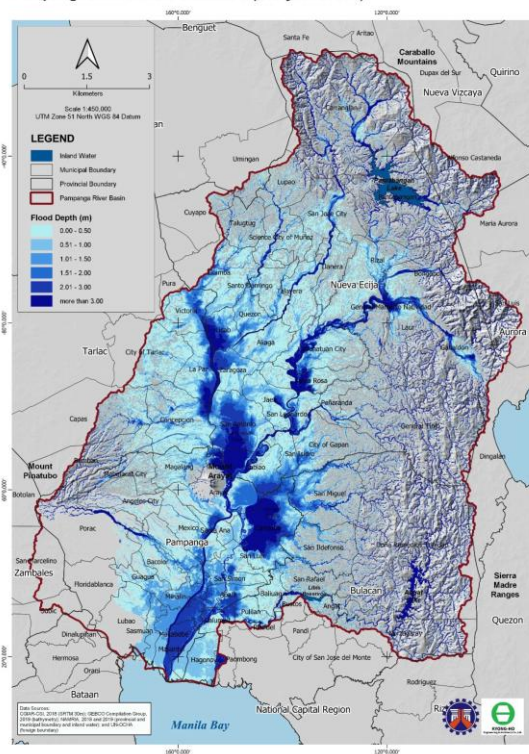


Comparison of Existing vs. Preferred Scheme

Pampanga River Basin: Existing Condition (100-year Flood)



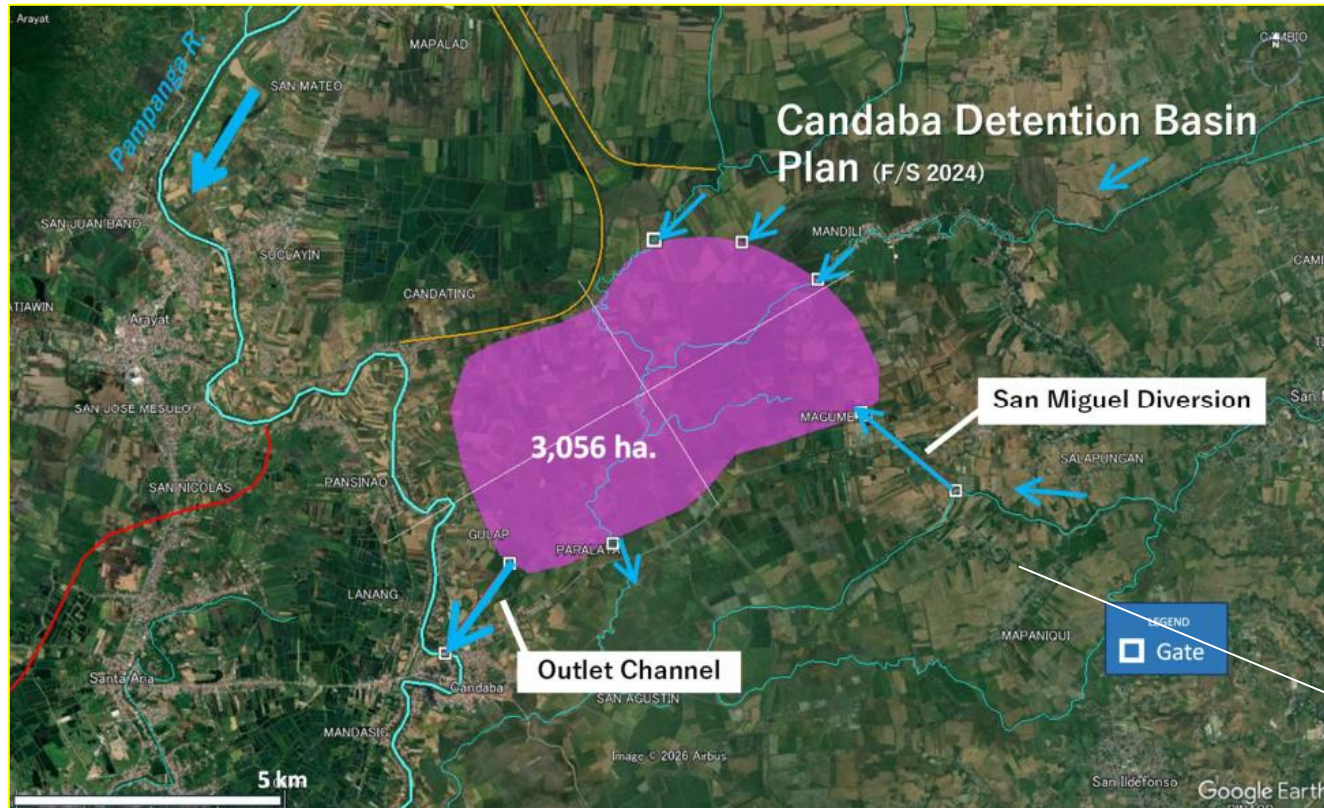
Pampanga River Basin: Scheme 3 (100-year Flood)





Candaba Swamp

Original plan for Candaba Swamp



Why?

- Retain and store water
- Delay flood waters downstream

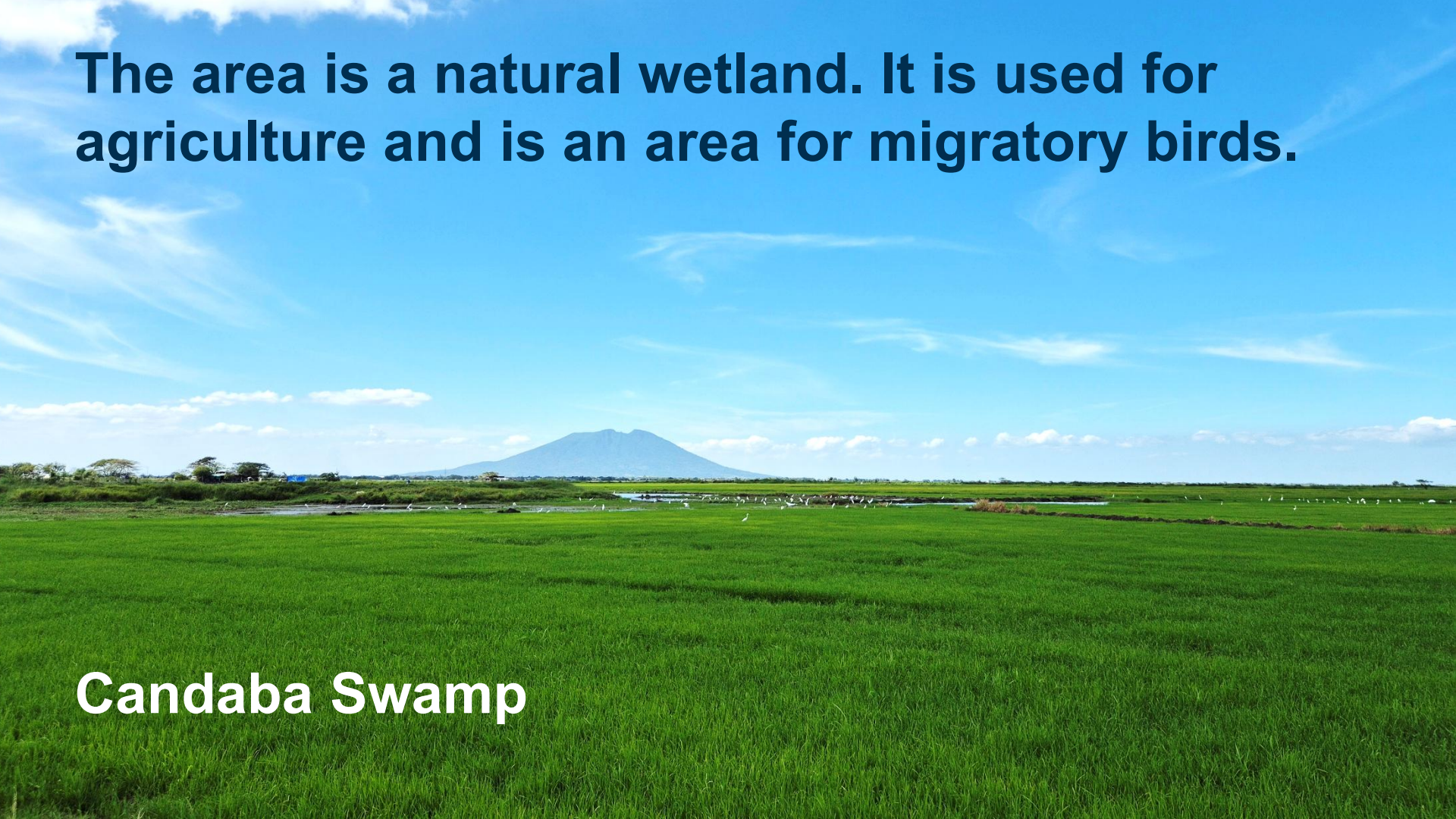
Good idea?

- In principle, yes...
- In practise, no...

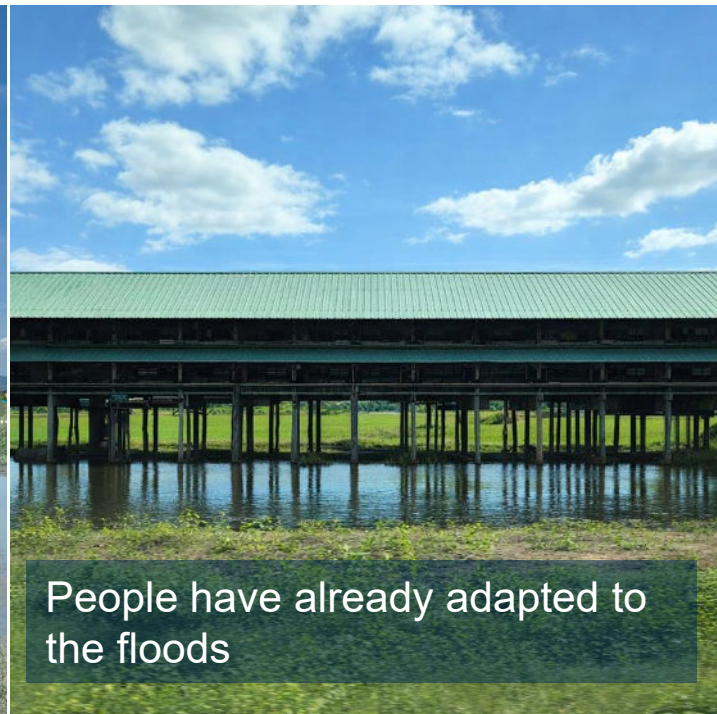
②

The area is a natural wetland. It is used for agriculture and is an area for migratory birds.

Candaba Swamp



Local flooding situation

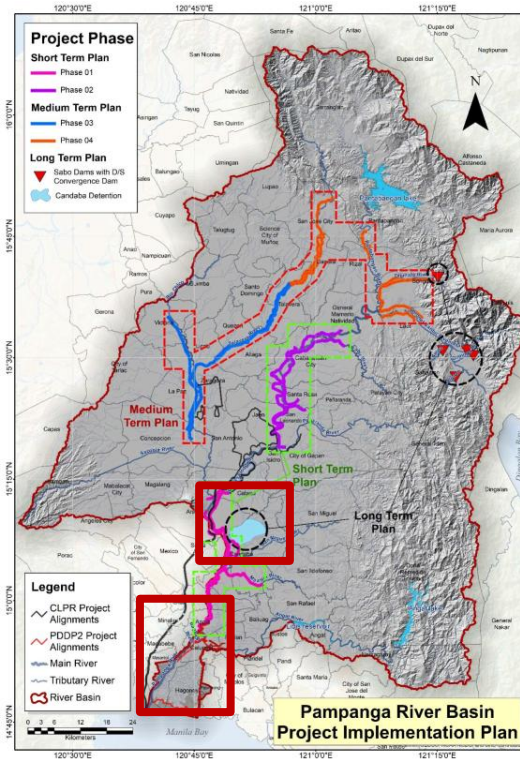
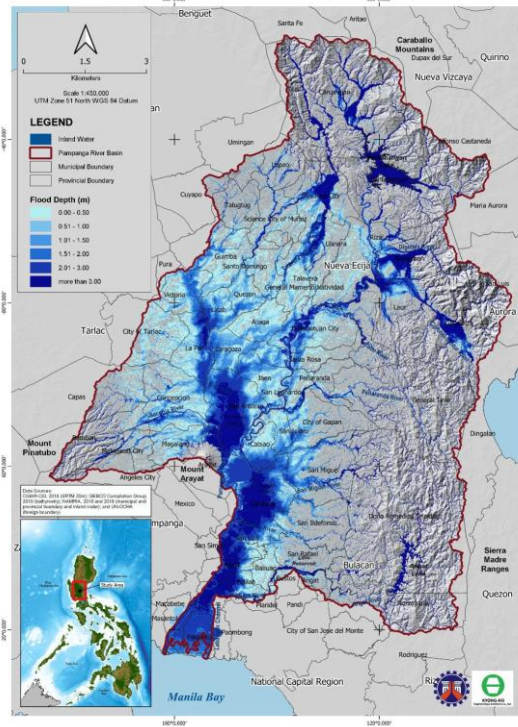


More nature-based solution: pocket retention

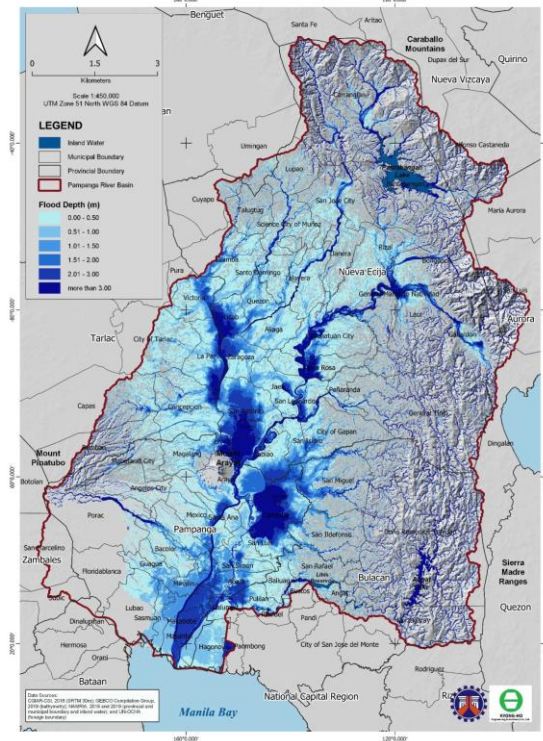


Comparison of Existing vs. Preferred Scheme

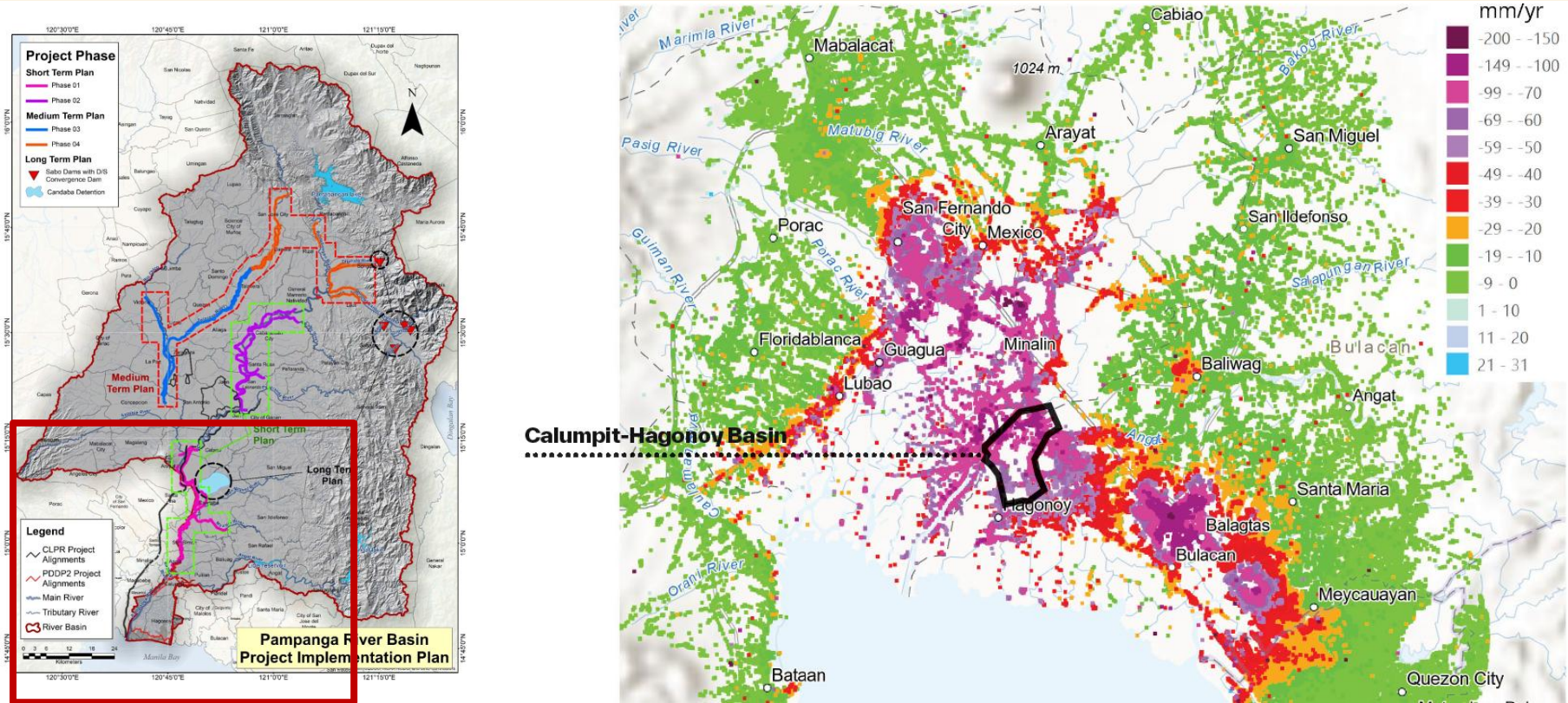
Pampanga River Basin: Existing Condition (100-year Flood)



Pampanga River Basin: Scheme 3 (100-year Flood)



Land subsidence in the North Manila Bay (2015-2021)



2020



2022



Rice fields became
permanently drowned in a
matter of few years

2023



2024

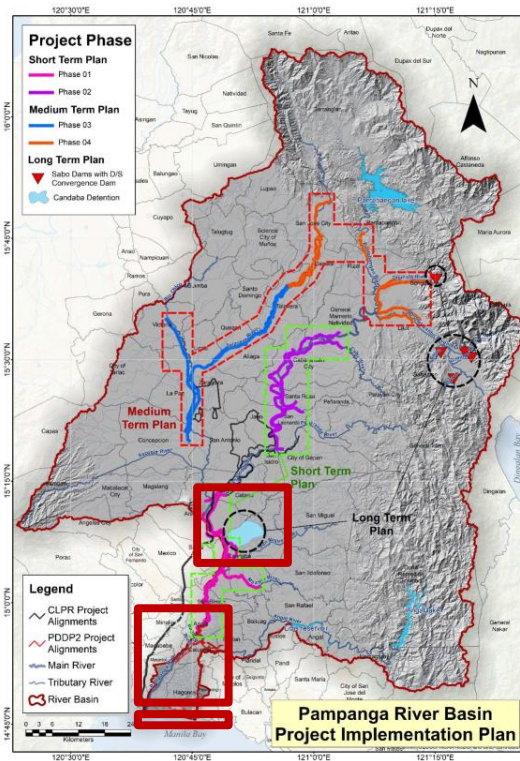
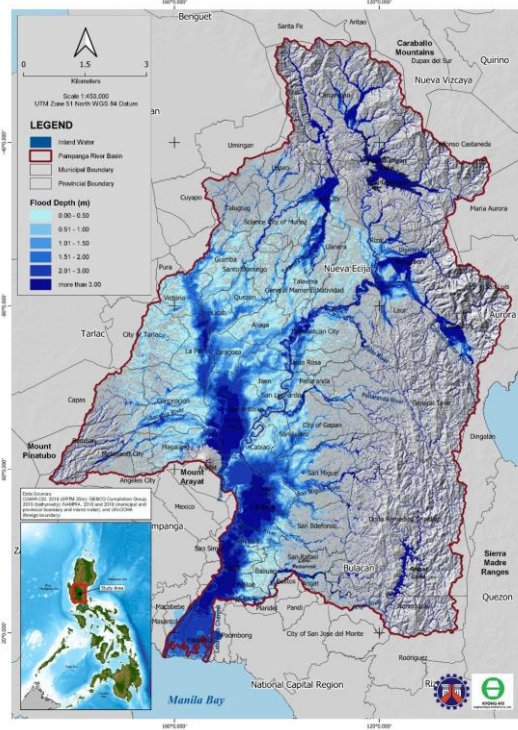


Flood situation last week (sept 2026)

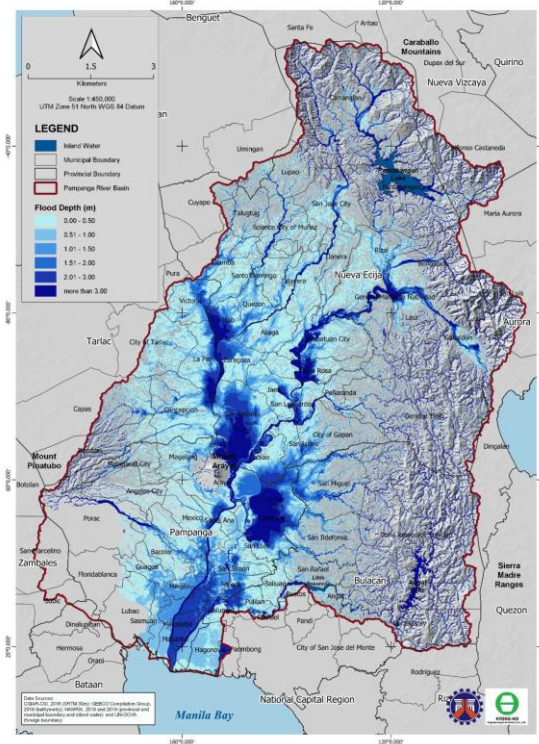


Comparison of Existing vs. Preferred Scheme

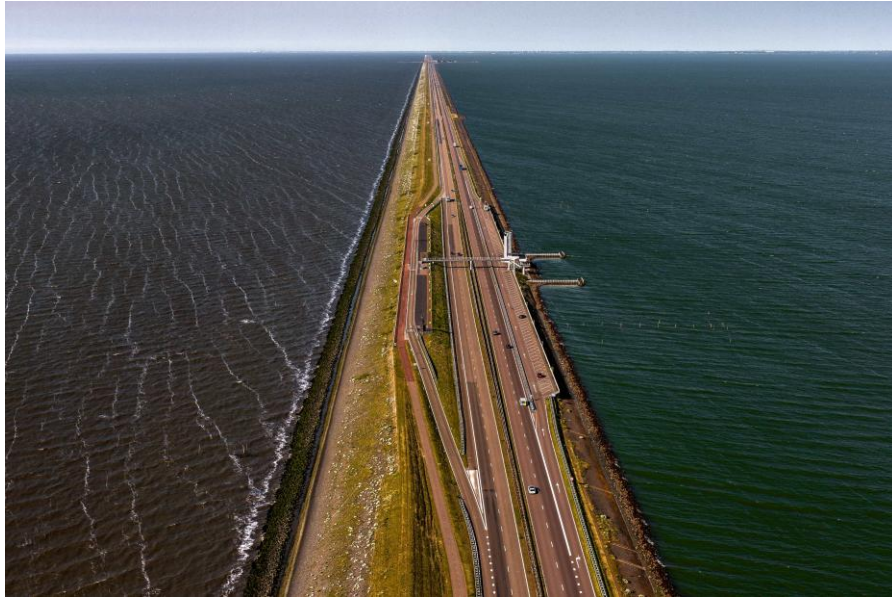
Pampanga River Basin: Existing Condition (100-year Flood)



Pampanga River Basin: Scheme 3 (100-year Flood)



Traditional approach to coastal defence



Traditional approach to coastal defence



Current Construction Progress

Management, monitoring
and maintenance



Capacity building



DED Design-3D Perspective View

Aerial Image from site visit- 29 April 2026



Sediment Trapping Units

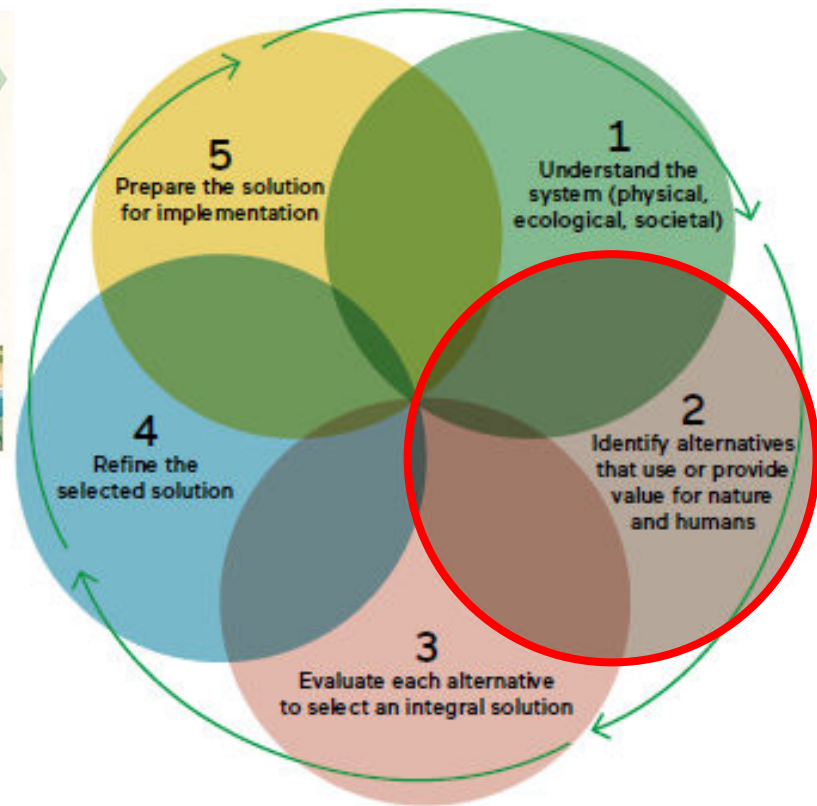


NbS breakwater



Work on case studies Part 2

Working on our cases



Working on our cases: guiding questions

- Check before you start: Has their systems understanding helped to identify the root cause(s) to your problem(s)? If not, continue with unravelling your systems understanding because otherwise you are merely addressing symptoms (temporarily).
- If you could change only one part of this system, where would you intervene; why? What changes in the systems functioning and what are (un)intended effects?
- How can ecosystem (services) be restored, protected or enhanced? Think of the effects this has on the systems functioning overall?
- Are there/have their local practices/customs (from the past) that addressed a root cause? Can it be re-established?
- Ideate on possible interventions and then consider: Which intervention address several problems simultaneously? Is the intervention working against or along side / benefitting from natural processes?
- Think of the long term; what needs to be monitored and maintained? By whom? What incentives are there for this?

Conclusions & Salamat Po

Current climate adaptation fails because:

- It is fragmented
- Implementation is poor
- Maintenance is lacking
- Innovative solutions are not yet enabled
- Measures do not address the root causes

Stronger climate adaptation plans start with:

- Holistic system understanding (nature, people, economy)
- Integrated package of measures
- Learning-by-doing for innovative solutions



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