



Nature and Climate Nexus: Promoting Nature based Solutions (NbS) for Sustainable Infrastructure<u>s</u> in Asia and the Pacific

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15 September 2022 (Wednesday) / 2–4 p.m. (Philippines Time) / Zoom

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# What are Nature-based Solutions (NbS)?

Actions to protect, sustainably manage, and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits





### And why are NbS so popular?



### What is Natural River Management (NRM)?

Low interference management of rivers aiming to optimize river use and to reduce river related risks, while respecting natural dynamics and flow of fresh water, sediment and nutrients, and peoples' dependence on these at a basin scale.









### And why is NRM relevant?





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### Understand the natural system





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### Step 1: Define goals and objectives

#### NRM APPROACH

Step 1: Definition of goals and objectives **Step 2:** System analysis **Step 3:** Selection of hotspot areas Step 4: Selection of NbS **Step 5:** Impact and economic analysis **Step 6:** Prioritization of interventions Step 7: Implementation Step 8: Maintenance and monitoring

River function	Objective
Nature	<ul> <li>Ensure flows of freshwater and sediment to sustain downstream livelihoods, ecosystem services and biodiversity</li> </ul>
Flood safety	• Decrease vulnerability of people to flooding through targeted, sustainable and long-term strategies per river section
Other functions	• Accommodate other functions but minimize interference with natural river behavior as much as possible

### Step 2: System analysis

#### NRM APPROACH

Step 1: Definition of goals and objectives Step 2: System analysis **Step 3:** Selection of hotspot areas Step 4: Selection of NbS **Step 5:** Impact and economic analysis **Step 6:** Prioritization of interventions **Step 7:** Implementation Step 8: Maintenance and monitoring

### The Long Profile



### Step 3: Selection of hotspots

#### NRM APPROACH

- **Step 1:** Definition of goals and objectives
- Step 2: System analysis
- **Step 3:** Selection of hotspot areas
- Step 4: Selection of NbS
- **Step 5:** Impact and economic
- analysis
- **Step 6:** Prioritization of interventions
- Step 7: Implementation
- Step 8: Maintenance and monitoring



### Step 4: NbS options

#### NRM APPROACH

**Step 1:** Definition of goals and objectives

- Step 2: System analysis
- **Step 3:** Selection of hotspot areas

Step 4: Selection of NbS

Step 5: Impact and economic

analysis

- **Step 6:** Prioritization of interventions
- Step 7: Implementation
- **Step 8:** Maintenance and monitoring



### Step 4: Selection of suitable NbS

#### NRM APPROACH

Step 1: Definition of goals and objectives
Step 2: System analysis
Step 3: Selection of hotspot areas
Step 4: Selection of NbS
Step 5: Impact and economic analysis
Step 6: Prioritization of interventions
Step 7: Implementation

Step 8: Maintenance and monitoring



### Step 5+6: Interventions selection and CBA

#### NRM APPROACH

**Step 1:** Definition of goals and objectives

- **Step 2:** System analysis
- **Step 3:** Selection of hotspot areas

Step 4: Selection of NbS

**Step 5:** Impact and economic analysis

**Step 6:** Prioritization of interventions

Step 7: Implementation

Step 8: Maintenance and monitoring

Include co-benefits

- Assess effects on larger spatial scales
- And on larger time-scales including uncertainty



### Step 7: Implementation: design, construct, build

#### NRM APPROACH

**Step 1:** Definition of goals and objectives

- Step 2: System analysis
- **Step 3:** Selection of hotspot areas
- Step 4: Selection of NbS

Step 5: Impact and economic

analysis

- **Step 6:** Prioritization of interventions
- Step 7: Implementation
- Step 8: Maintenance and monitoring

#### Dutch Room for the River program

#### **B. MAATREGELEN**



### Step 7: Implementation: design, construct, build

#### NRM APPROACH

Step 1: Definition of goals and objectives **Step 2:** System analysis **Step 3:** Selection of hotspot areas Step 4: Selection of NbS **Step 5:** Impact and economic analysis **Step 6:** Prioritization of interventions Step 7: Implementation Step 8: Maintenance and monitoring Dutch Room for the River program



### Step 7: Implementation: design, construct, build

#### NRM APPROACH

**Step 1:** Definition of goals and objectives

- **Step 2:** System analysis
- **Step 3:** Selection of hotspot areas
- Step 4: Selection of NbS
- **Step 5:** Impact and economic

analysis

- **Step 6:** Prioritization of interventions
- Step 7: Implementation
- Step 8: Maintenance and monitoring

- Dutch Room for the River program
- Bangladesh Deltaplan
- Mississippi coastal master plan



### Step 8: Manage, maintain and monitor

#### NRM APPROACH

**Step 1:** Definition of goals and objectives

Step 2: System analysis

**Step 3:** Selection of hotspot areas

Step 4: Selection of NbS

**Step 5:** Impact and economic

analysis

- **Step 6:** Prioritization of interventions
- Step 7: Implementation
- **Step 8:** Maintenance and monitoring



### Take home

- Nature-based Solutions can be applied in all settings for all type of hazards
- Synergy NbS and infrastructure
- Prepare to learn and adapt







## **THANK YOU!**