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List of Content

Figures

Boxes

Tables

Glossary

Ecosystem-based Adaptation (EbA)

Nature-based Solutions (NbS)

Climate Risk and Vulnerability Assessment (CRVA)

Green Infrastructure

Hybrid solutions

Ecosystem Services

Adaptive Capacity

Acronyms

CCMP	
CDP	
CoP	
Eco-DRR	
FLR	Forest Landscape Restoration
FPIC	
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
IPLC	
IUCN	
NbS	
NCCC	
NWRM	
TGCP	
TMD	

who contributed to the process of developing the *Guidebook for the Design and Implementation of Ecosystem-based Adaptation in River Basins in Thailand*

development agencies, government agencies and academics.

Foreword

threats. Incidences of drought in the dry season and more common, with nationwide impacts that who rely heavily on natural resources and agriculture for their livelihoods. As we are beginning to see the limitations of traditional, grey infrastructure approaches to water management, there is now increased understanding that the restoration, management and conservation of ecosystems can strengthen the challenges, providing multiple benefits to both communities and biodiversity.

Guidebook for the Design and Implementation of Ecosystem-based Adaptation Measures in River Basins in Thailand was developed as part of the led the development of the Guidebook, with support the result of multiple rounds of consultation with Organisations, held to ensure that it is as applicable nature to support climate change adaptation in the water sector, providing human and biodiversity the associated forms, aim to guide practitioners through the process of designing, implementing, monitoring and evaluating, and mainstreaming implementation of a range of EbA measures for water.

change resilience in river basins. It will directly support the work of River Basin Organisations as engineers as they design and implement measures to reduce climate change vulnerability.

will support the integration of the Guidebook into promoting the mainstreaming of EbA in our work.

development at the national level, simultaneously decreasing risks and enhancing biodiversity throughout the country.

aims to serve as a framework for understanding, developing, implementing and mainstreaming

on the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help

have seen increasing mention of EbA, at global conventions on climate change and representation

local governments are beginning to understand the value of EbA as an important means of simultaneously

restoring ecological integrity while also provide

have shown a trend towards wetter wet seasons and drier dry seasons, potentially leading to

and landslides) and drought throughout the country,

Overall, the process of implementing EbA in

outcomes:

and droughts, and their impacts, at the local, provincial and national levels;

- Limiting erosion and siltation processes,

agriculture;

- Reducing reliance on grey infrastructure, thus reducing initial and maintenance costs for

costs;

- Developing a shared understanding of opportunities to implement EbA and the promotion

target user groups:

- Relevant government agencies directly responsible for water management or adjacent natural resources and infrastructure management;
- Relevant government agencies responsible for climate change adaptation;
- Individuals who are contributing to the

regional level, who need to understand the process of designing and implementing EbA for water.

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Part 1

Nature-based Solutions and Ecosystem-based

1.1 Ecosystem Services

Ecosystem services form the basis of any

Assessment analysed the work of more than 1,360

The four categories of ecosystem services with examples of services within the categories (RRC-EA 2020)

In most cases, one ecosystem provides a range of services, across several of the four categories.

factors including the size of the ecosystem, but also its state of conservation, and who is using the services. Degradation of ecosystems will lead to a decrease in the services they are able to provide.

1.2 Nature-based Solutions

Acronym list for Figure 2

Ecosystem restoration approaches	
ER	Ecosystem Restoration
EE	Ecosystem Engineering
FLR	Forest Landscape Restoration
Issue-specifc ecosystem-related	
EbA	
Infrastructure-related approaches	
GI	Green Infrastructure
NI	Natural Infrastructure
Ecosystem-based Management	
Ecosystem protection approaches	

1.2.1 Nature based Solutions – key criteria

clarity and precision of what the concept entails and what is required for it to be successfully deployed.

applications.

? Dp_kcumpi dmp Bcrlglle Os_jgra_rgml Apgrcpg_ _lb Os_jgrw Qr_lb_pbq

and their associated indicators, which address the pillars of sustainable development (biodiversity, economy and society) and resilient project management.

the International Institute for Environment and

selected as a more comprehensive set of criteria to

relevant, to demonstrate the similarities between the two sets of criteria.

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Box 1

Criterion 1 - NbS effectively address societal challenges

designed in response to a societal challenge(s)

who are or will be directly affected by the challenge(s). All stakeholders, especially rights

identifying the priority challenge(s).

Criterion 2 - Design of NbS is informed by scale

only to the biophysical or geographic perspective

policy frameworks and the importance of cultural

interactions and risks.

Criterion 7 - NbS are managed adaptively, based on evidence

ecosystems have greater resilience, which confers a wider range of options to respond to unanticipated social, economic or climate events.

attribute of ecosystems through designing of adaptive management strategy for the proposed

Criterion 8 - NbS are sustainable and mainstreamed within an appropriate jurisdictional context

sustainability and are aligned with sectoral,

however, all rely on strategic communications and outreach with audience from different sectors, including individuals, institutions (e.g. national government) and global networks

Agreement).

Box 2

Box 2

and ecosystems with a focus on protecting ecological integrity and native species, and preventing the introduction of invasive alien species.

1.3.1 EbA in a river basin – the overall approach

river basins, there is a wide range of opportunities to conserve, manage and restore ecosystems from

that can strengthen the resilience of communities

Figure 3 presents a vast array of EbA approaches

on integrated water and climate change or disaster

Transitioning from a business as usual approach (left) to an EbA approach (right) in river basins (GIZ 2018)

Box 3

measures do not necessarily include the restoration, conservation or management of

stakeholders from the beginning of the EbA development process, is however, essential for inclusive, transparent and empowering

EbA, the measure must meet the following three criteria:

- Is the approach focusing on tackling a
- Is the proposed/implemented solution to climate threats based on (or include elements) of restoration/conservation/ management of ecosystems to maintain/
- Does this approach provide biodiversity

Box 3

changes in precipitation patterns may adapt to

an EbA, because there is no conservation,
management or restoration oq0706yste804005400w 13.56w 1b3460003e0 e05/6hae1 restoration oq0c d( )1n Eb

Box 4 EbA and grey infrastructure

Box 4 EbA and grey infrastructure

to human lives and infrastructure must be urgently tackled in urban areas and can use grey infrastructure such as dikes and embankments to provide immediate protection. A complementary

reduce the strength, speed and occurrence of

adaptation. As grey infrastructure is developed, its impact on green infrastructure needs to be assessed to ensure that one approach does not lead to a limitation for the other.

In addition, and in a number of cases, grey

develop complementary hybrid solutions. A

approaches, combining the use of water

treatment. Bank erosion management can also

infrastructure using rocks, concrete and

solving societal challenge is to progressively shift

infrastructure. Keeping in mind the use of grey infrastructure for situations requiring immediate outcomes will likely always remain part of any adaptation strategy.

1.4 Thailand – which context for EbA in the water sector?

1.4.1 Overview of climate change in Thailand and impacts on the Thai water sector

the world to the impacts of climate change (Global

densely populated urban areas and high dependency on agriculture in rural areas increase the potential impacts of climate change to both biodiversity and society.

an increase in temperature, coupled with changes in rainfall patterns, leading to impacts on water availability for ecosystems, agriculture and household

have also documented an increase in annual

increase coming during the wet season (Lacombe

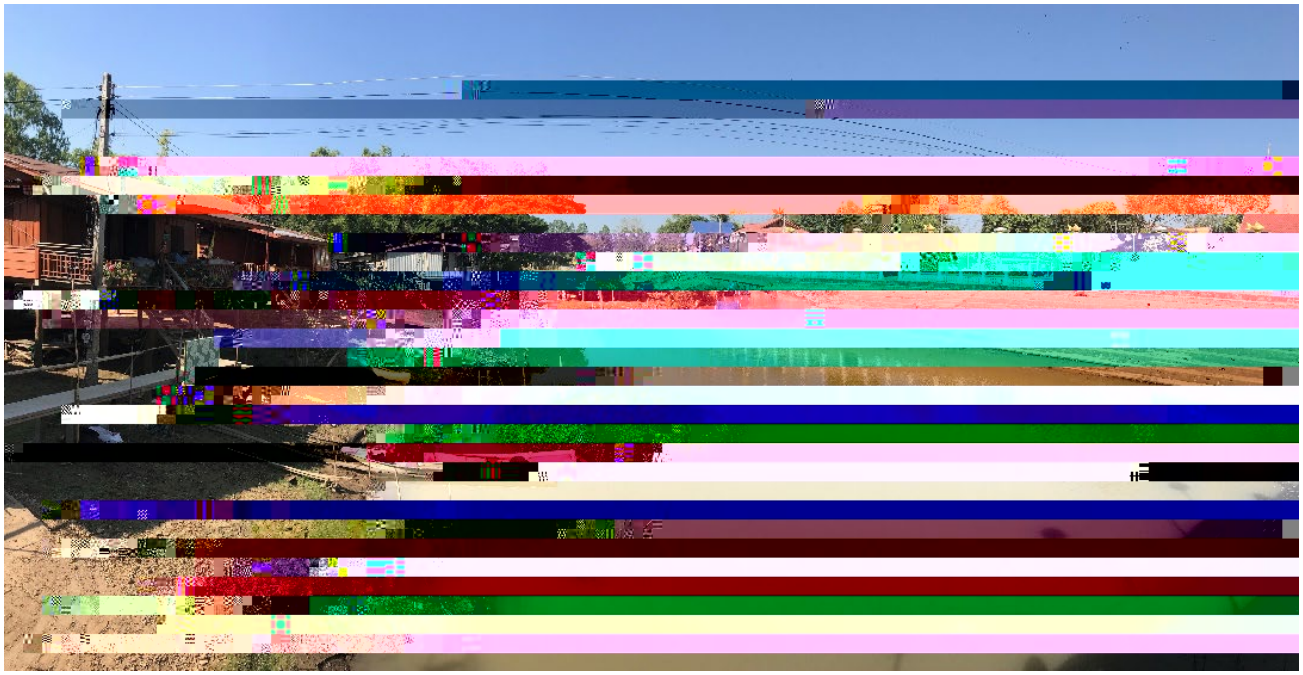
precipitation events across the country have become less frequent, individual events have increased in

impacted more than 13 million people, and led to

period of recurring and prolonged droughts from

national food security as well as local livelihoods of

signif ɨ



Traditional house on stilts opposite concrete bank reinforcements in Kong Krailat District

1.4.3 Overview of water, natural resources and climate change related policies of relevance to EbA

of policies related to water resources and climate change to reduce future impacts of changes in temperature and precipitation.

Nationally Determined Contribution (2020-2030)

these approaches will be used to strengthen ecosystem services, nor does it specify which ecosystems will be targeted. However, the *NDC Roadmap (2021-2030)* provides more detail, specifically mentioning EbA actions such as

management, agriculture and food security, tourism, public health, natural resources management and human settlements and security, highlighting the

National Adaptation Plan (2018-2037)

for the sustainable management of natural resources

Office of Natural Resources and Environmental Policy and Planning (ONEP) is the organization that develops climate change policies on managing, preventing, and solving climate change country.

are directly related to water management, including the Department of Groundwater Resources and the Department of Water Resources, which is responsible for the management of small and

Royal Forest Department (RFD) responsible for developing forest policies that can

Department of Marine and Coastal Resources (DMCR), focuses on coastal forests, coral reefs and seagrass beds, and their conservation and restoration.

Ministry of Agriculture and Cooperatives

Ministry of Agriculture and Cooperatives (MoAC) is responsible for developing agricultural policies, and is one of the oldest ministries in

Royal Irrigation Department (RID), which works on ensuring the sufficient development of water resources based on the needs and capacities of each watershed, allocating water to all water users with fair and inclusive manners,

Office of Agricultural Economics (OAE) is operated compiling and disseminating the agricultural information report as well as studying and the agricultural economics.

Ministry of Interior

Ministry of Interior (MOI) responsible for a variety of tasks ranging from disaster management, road safety, land management and public works to internal security, citizenship and local administration. Department of Disaster Prevention and Mitigation (DDPM) is the core working on developing information technology system for disaster prevention and implementing disaster risk reduction mechanism. In collaboration supports the development of climate forecasting technology that will be the tool to forecast the

Ministry of Digital Economy and Society (MDES)

Thai Meteorological Department (TMD) is responsible for weather forecasting, meteorological observations and data collection and analysis, and is thus a particularly relevant stakeholder when conducting work on both water and climate change adaptation.

be managed as such. However, there is room for improvement in recognising that a similar approach and cooperation.

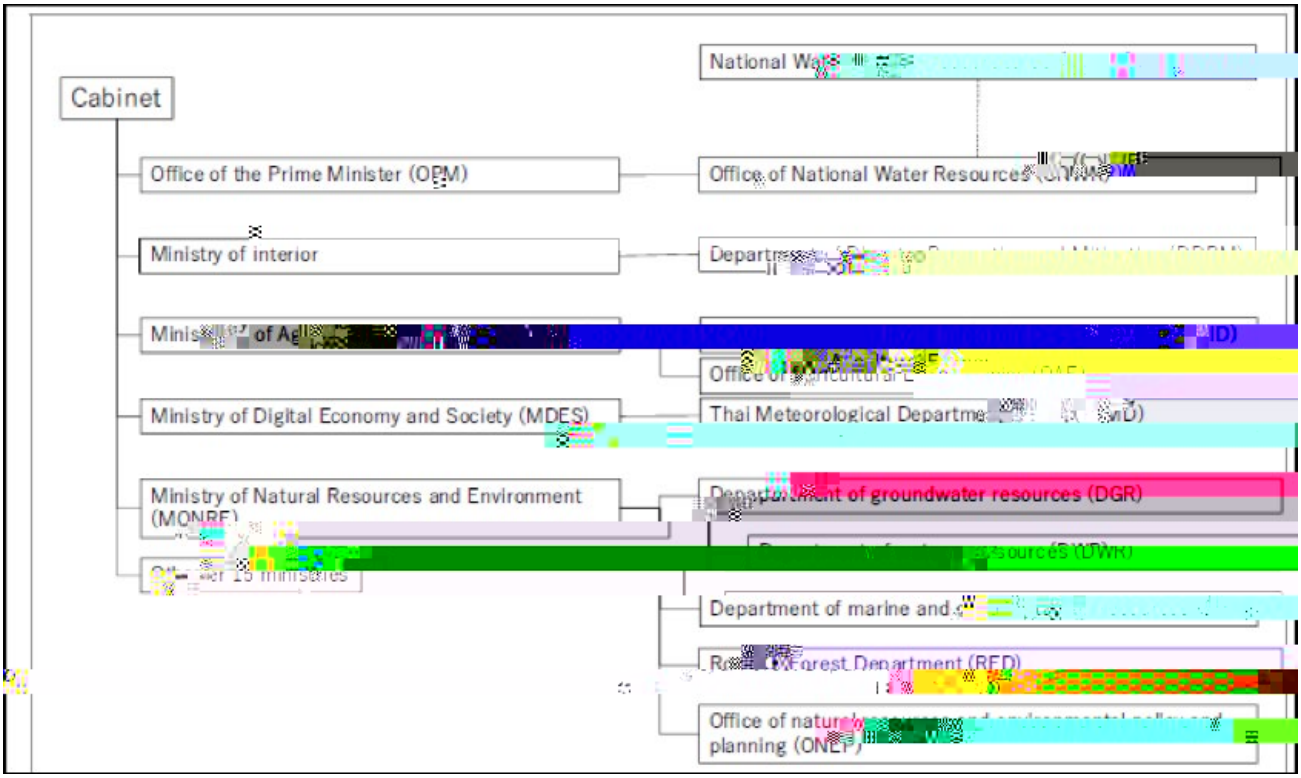


Diagram of the major government organisations involved in adaptation in the water sector (Kiguchi et al 2021)

1.4.5 Policy mainstreaming and entry points

the benefits that EbA can deliver, while also

coherence on climate change adaptation and water, engaging all relevant ministries, including

regulatory frameworks to support the design, promote and develop policies that strengthen the

Roadmap only makes a generic mention of either

in policies and strategies contributing to the

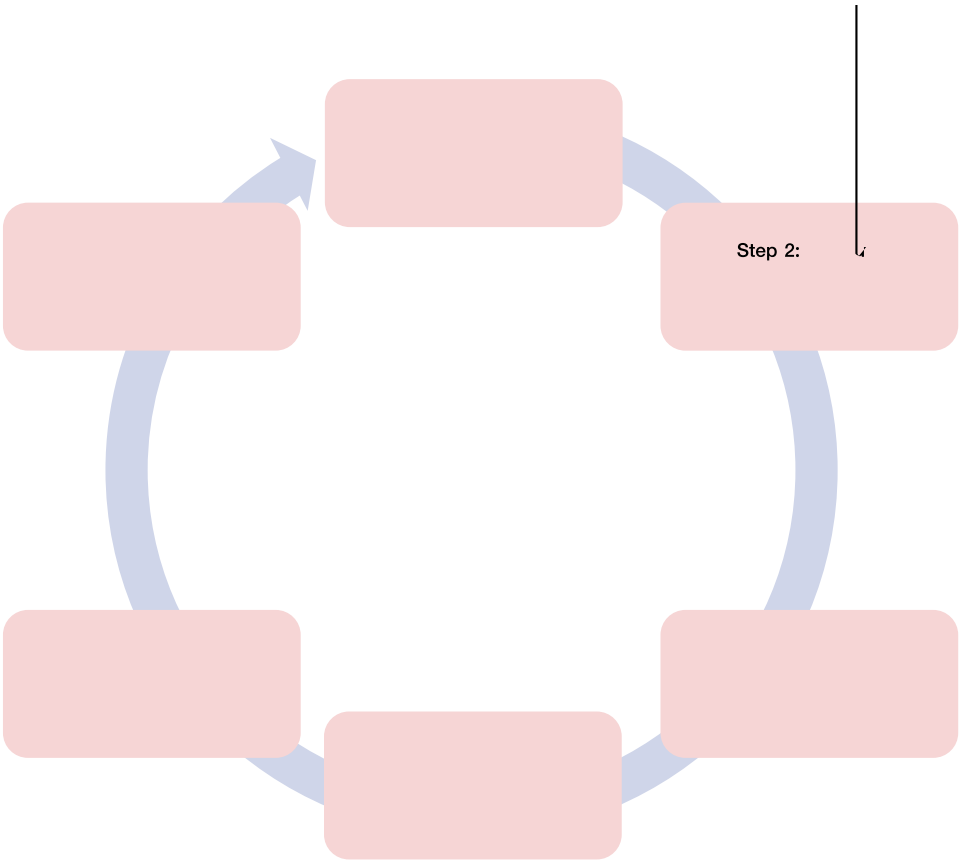
a common framework to help benchmark progress

assessment provides a percentage match compared against good practices, with outputs that identify

1.4.7 Financing EbA

Part 2

From theory to practice: steps for EbA development and

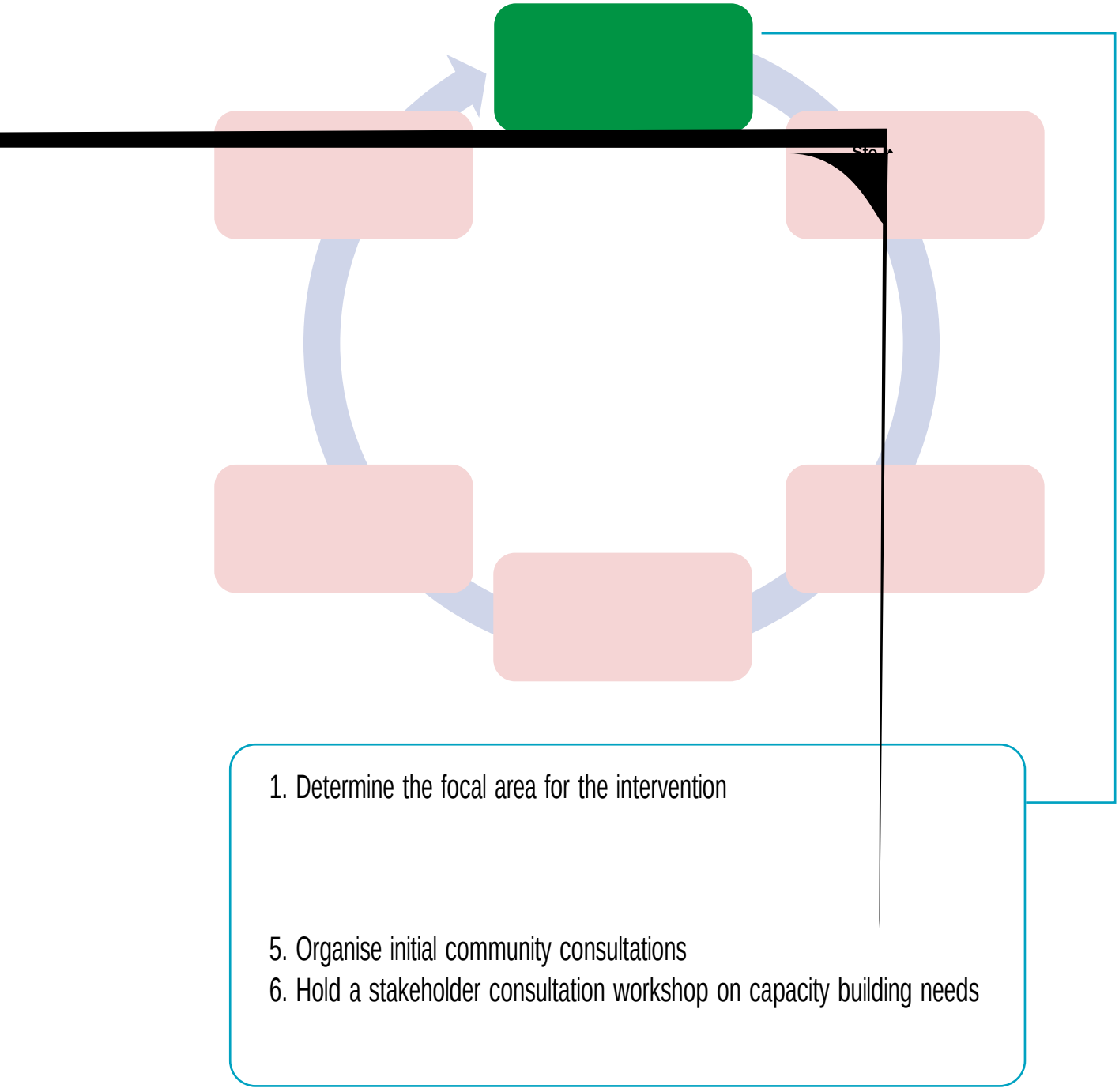


Process of planning and implementing EbA as part of a climate change adaptation strategy (Adapted from: Secretariat of the Convention on Biological Diversity (2019)).

Indicative timeline for implementation

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

Step 1:
Stocktaking and Planning



Objective: This initial step aims to develop a preliminary understanding of the societal challenge to be addressed, to understand planned and ongoing measures in the focal area, and pre-assess whether EbA can potentially address climate impacts at the site and possible EbA approaches to be developed.

Activities

1. Determine the focal area for the intervention

impacts on local livelihoods or infrastructure, such

design must take into account the interactions that

process, the selection of the focal area can be

5. Organise initial community consultations to understand:

Outputs

Literature review

Climate Change Vulnerability

of the climate risks and vulnerabilities within the

the susceptibility of a natural or human system to

results of these assessments highlight key entry

to address the most pressing threats to both ecosystems and communities, thus increasing

key climate driver of change will be changes in rainfall patterns within the focal basin; temperature

are observed and projected changes in the frequency

vulnerability

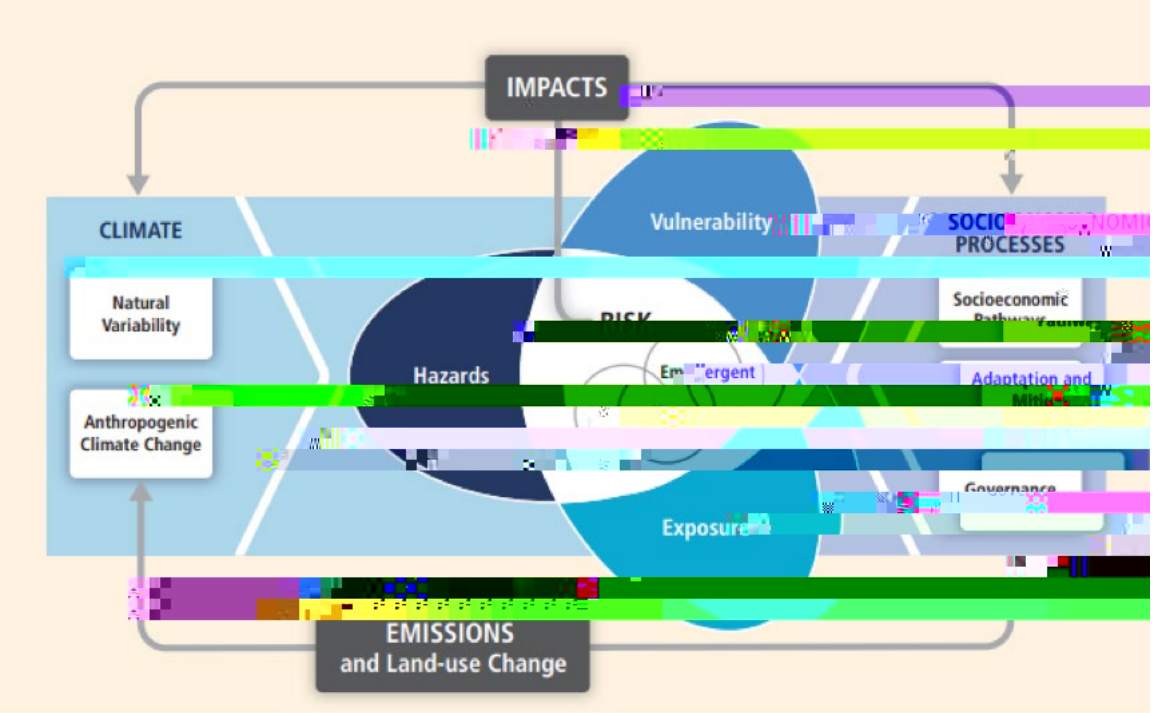
encompasses a variety of concepts and elements

including sensitivity or susceptibility to harm and lack

Exposure is the presence of people, livelihoods, species or ecosystems, environmental functions, services and resources, infrastructure or economic, social or cultural assets in places and settings that

A hazard is the potential occurrence of a natural or human induced event, trend or impact that may lead to the loss of life, injury or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems or environmental resources (Oppenheimer

Risk is potential for consequences where something of value is at stake and where the outcomes are uncertain. Risk is the result of the



Climate Risk and Vulnerability Assessment

3. Identifying and selecting indicators for risk components

5. Normalisation of indicator data

composite risk indicator

the risk assessment

months to implement and consists of eight main steps and an online tool and consists of:

Form 2A: Summary of key risks and vulnerabilities highlighted in the VA

Outputs

1	communities and stakeholder groups, livelihoods and infrastructure in the focal area

Additional Resources

wetlands, and further consultations with local stakeholders may reveal that the wetlands hosted

analysing key information about the project area/ landscape, its vulnerability to climate change and

is taking the stakeholders through the process of

vision will focus on the desired situation in the basin, compared to the climate change threats, and opportunities to manage, conserve and restore ecosystems to tackle these climate threats (the core asnservus on thgnroceEbA activportun d(0.02T 0 1.servus ir implementd sit. ess of)j7C 1 f0J0 f0.002T /p FJHOED(8SZ4FUcomby enginecrs0 d( )310.02d 0.06 w 0 1.2ervmodellcrs, unakered tooordind situoceed

Component		
Climate Vulnerability *Use data from* *Step 1- Stocktaking and*		

Component	

Example of EbA Vision- Flood Management in Theoretical Basin A

Component	Current Status (Summary of information from Steps 1-4)	Vision/Expectations for the next 30 years
Sustainability and mainstreaming	measures in the basin, and ensuring that the lessons learned are shared disseminate the learnings and promote upscaling. Best practices will be integrated into a policy brief to be shared with all of the River Basin	

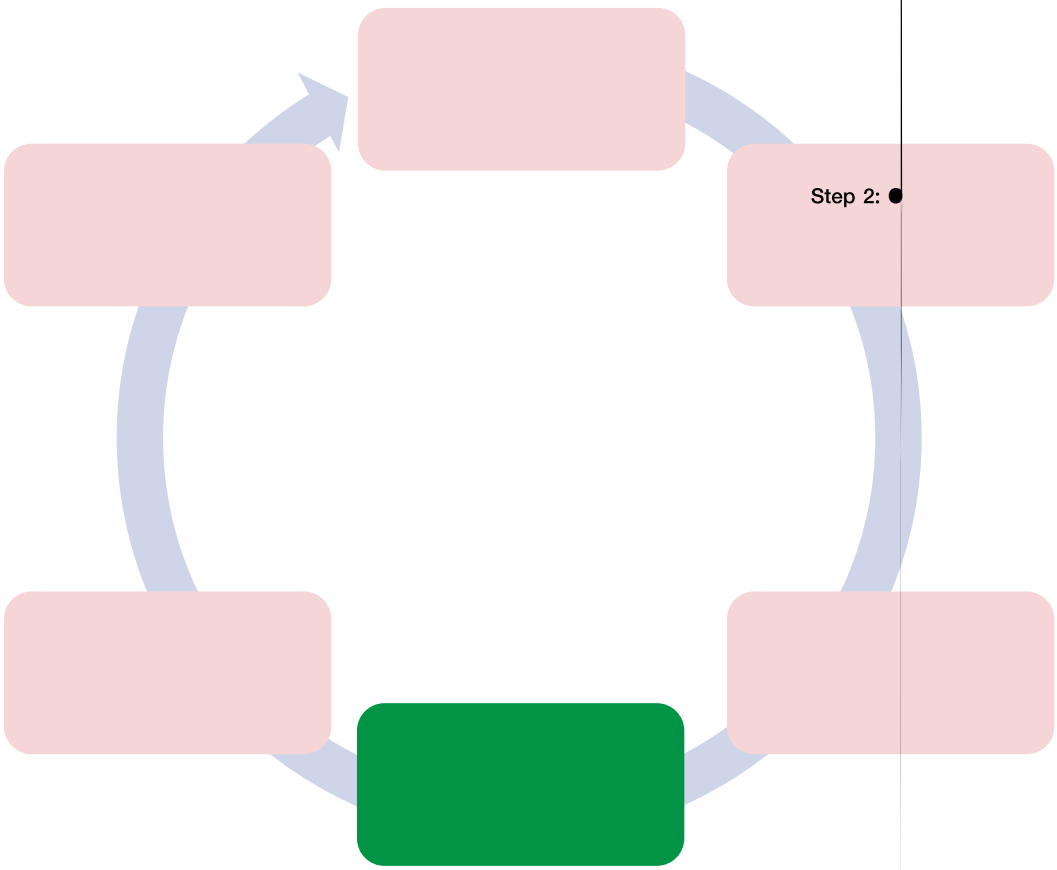
Outputs

1	in the focal area

Additional resources:

Adaptation Interventions. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Bonn, Germany.

Step 5:
Developing a Theory of Change to identify and validate EbA measures



5. Identify and/or describe the EbA measure and the key activities undertaken to implement it and assess their feasibility.
6. Develop a result chain for each activity

the communities

the design of the measures

Objective: This step aims to guide project implementers in identifying, describing and assessing the EbA measures based on the vision and approaches developed in Step 4, and then validating them. The measures selected will aim to reduce climate risks and vulnerabilities and maximise benefits for local stakeholders and biodiversity. This step is structured around the development of a Theory of Change and also references the EbA Code of Practice, which provides detailed instructions on how to design and implement seven pre-selected EbA measures for water in Thailand.

used to help design projects and activities. It supports the development and design of activities that intend to deliver a particular impact (e.g. an adaptation impact or an EbA vision) and it can also be applied to develop monitoring and evaluation

or illustration of why an activity or measure will be

medium and long term to achieve an intended impact. It can be shown in a visual diagram, or presented as a narrative, or both.

outcomes, outputs and activities. However

integrated into the design of the activities;

to ensure they are working towards the intended impacts;

measures and associated activities will deliver the desired impact, and work with engineers to conduct feasibility studies to ensure that the proposed

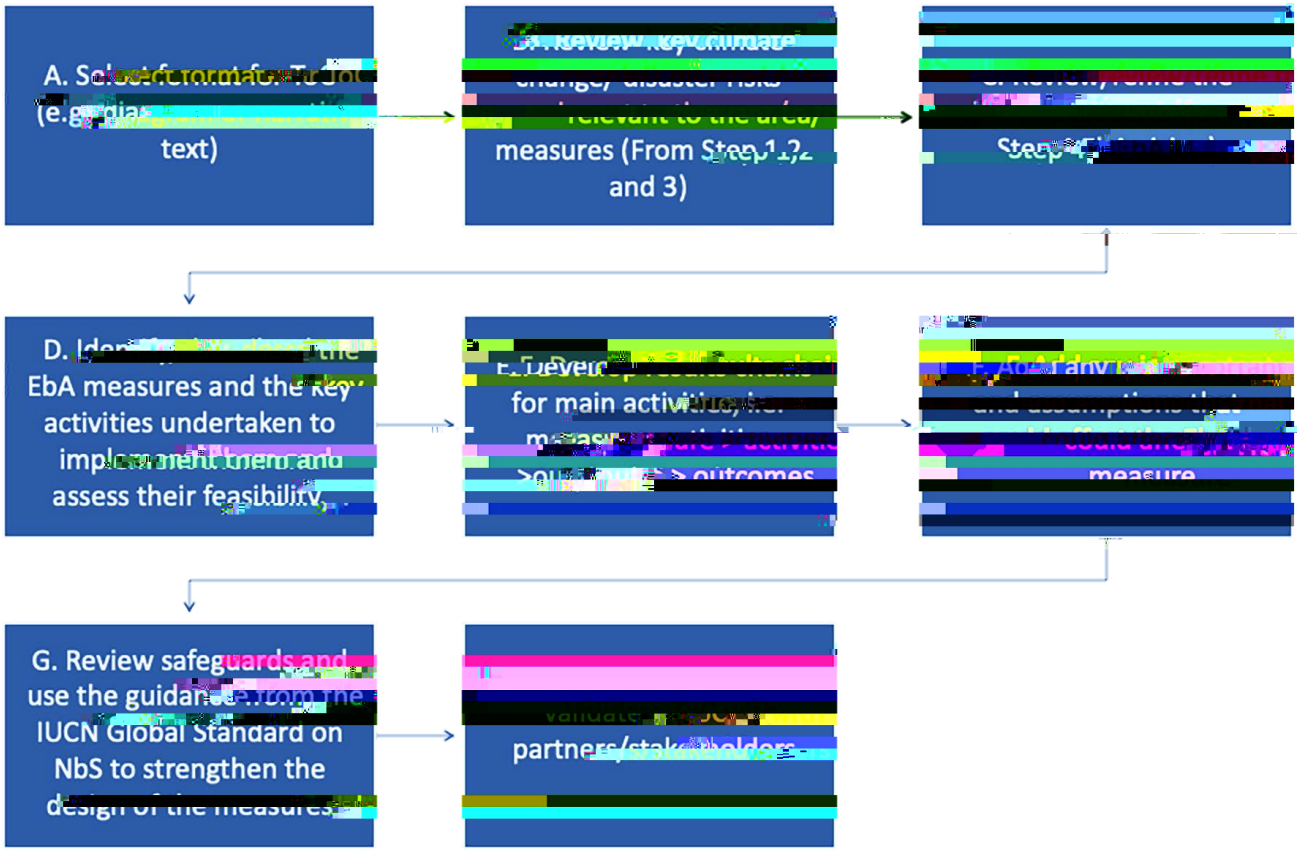
in the focal area, while minimising negative impacts.

location(s) to implement these measures.

Once the measure have been developed and selected, they will be screened through the eight

and weaknesses, and give the project team an opportunity to make adjustments before

by stakeholders before being implemented.



Step-by-step development of the ToC

1. Select the format for the Theory of Change

another application to make it easy to edit and share.

from left to right, i.e. starting with measure and corresponding activities on left and working towards impact on right. Backcasting is another approach, where the team works from right to left, starting with the desired impact and identifying what outcomes would create or lead to that impact, then identifying

already have a draft diagram that is being used.

solely on water management, however. Interventions to support the achievement of the vision can include working on connected ecosystems to enhance

promoting practices that limit water use in agricultural

also be implemented strategically throughout the basin to strengthen climate adaptation and provide

centre, green infrastructure and urban design

measures should be summarised using the concept note in Form 5A, and should detail the key activities to be completed by the government, communities

requires inputs on potential timeframes and budgets to support planning.

Once the potential EbA measures and activities

engineers will complete a feasibility study for each

retention rates, erosion reduction, or other relevant modelling studies depending on the type of measure selected.

outcomes provided by the measures, the technical

as well as a detailed budget and the stakeholders and responsible government agencies involved.

allocate funding for implementation and promote the measure as a feasible solution to solve the societal

Approach	Description	Key Ecosystem Services								
		Provisioning		Regulating and maintenance					Cultural	
			Fish stock enhancment	Biodiversity preservation	Groundwater aquifer recharge	Flood risk reduction	Erosion/ sediment control	Filtration of pollutants	Recreational opportunities	Aesthetic cultural value
Maintenance of restoration of forest cover in headwater areas*	water quantity and quality. Forest soils generally have catchments can contribute to slope stabilization and may reduce the risks associated with landslides. On may lead to reduction of downstream water yield.									
Bufer strips and hedges*										

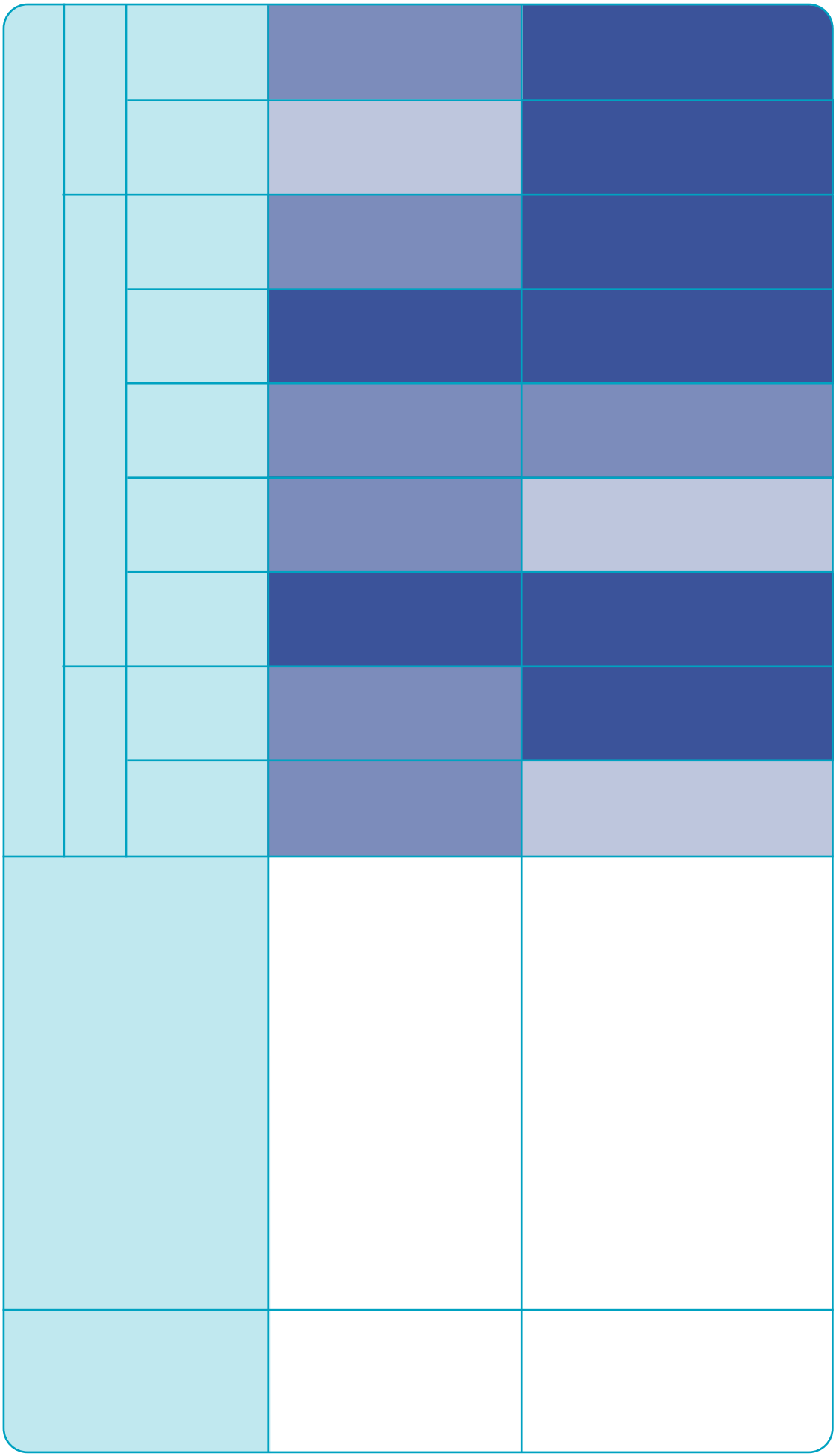


Table 3

Table 3

Approach	Description	Key Ecosystem Services								
		Provisioning		Regulating and maintenance					Cultural	
		Water storage/ drought reduction	Fish stock enhancment	Biodiversity preservation	Groundwater aquifer recharge	Flood risk reduction	Erosion/ sediment control	Filtration of pollutants	Recreational opportunities	Aesthetic cultural value
Mangrove restoration, conservation and management*	height and energy of waves, protecting coastal communities structures of mangroves are essential nursery grounds regenerating mangrove forests in areas where they									
Restoration and management of coastal wetlands*	in mitigating the impacts of storms, and are key habitats for blue carbon storage. Restoring seagrass beds, coral reefs, seagrass, propagating coral fragments or mangroves, or protecting these habitats to allow for natural regeneration. wetlands.									

* Indicates the measure is detailed in the Code of Practicf

2

Table 3

Table 3

Approach	Description	Key Ecosystem Services								
		Provisioning		Regulating and maintenance					Cultural	
		Water storage/ drought reduction	Fish stock enhancment	Biodiversity preservation	Groundwater aquifer recharge	Flood risk reduction	Erosion/ sediment control	Filtration of pollutants	Recreational opportunities	Aesthetic cultural value
Re-meandering	very often also has a positive impact on sedimenta tion and biodiversity.									
Restoration and reconnection of seasonal streams	Restoring and reconnecting seasonal streams with the river consists in favouring the overall functioning of the river by restoring lateral connectivity, diversifying seasonal streams for better water retention during									

* Indicates the measure is detailed in the Code of Practice

Legend:

Table 3

		Key Ecosystem Services								
		Provisioning								
			Fish stock	Biodiversity preservation	Groundwater aquifer recharge	Flood risk reduction	Erosion/ sediment control	Filtration of pollutants		
Riverbed material renaturalisation	recovering the natural structure and composition of the bed load, in particular the equilibrium between coarse sediment leading to river incision, the main sediment, strategically reactivating bank erosion in terrains contributing to this type of sediment.									
Removal of dams and other longitudinal barriers	Removing longitudinal barriers consists in destroying all the obstacles, restoring the slope and the sedimentary and ecological continuity.									

Table 3

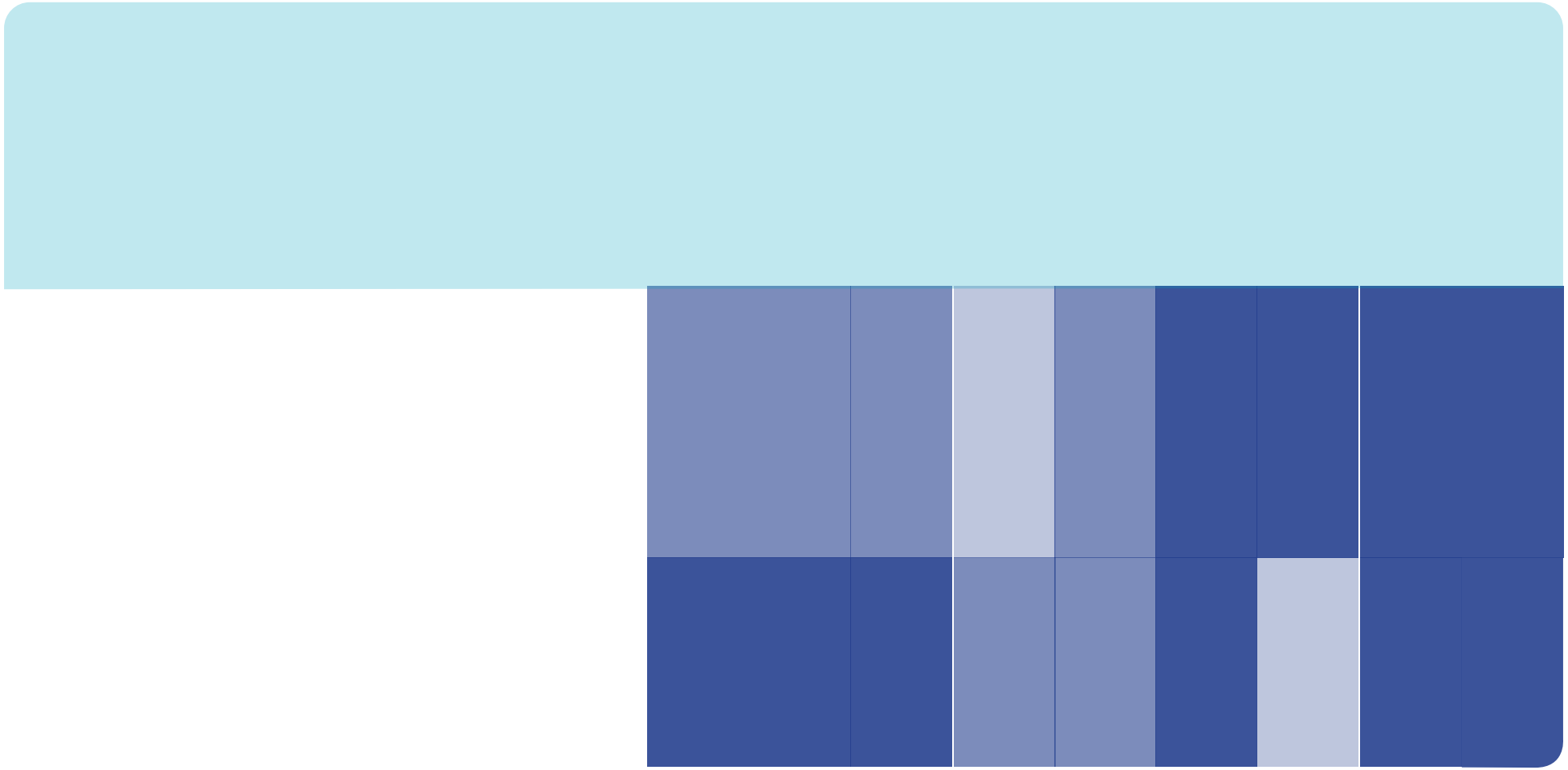


Table 3

Approach	Description	Key Ecosystem Services								
		Provisioning		Regulating and maintenance					Cultural	
		Water storage/ drought reduction	Fish stock enhancment	Biodiversity preservation	Groundwater aquifer recharge	Flood risk reduction	Erosion/ sediment control	Filtration of pollutants	Recreational opportunities	Aesthetic cultural value
Meadows and pastures	the uptake and storage of water during temporary increased water retention in the landscape and times with rooted vegetation, this reduces the the soil.									

* Indicates the measure is detailed in the Code of Practice

Legend:

6. Develop a result chain for each activity

and assessed, develop a results chain for each of it is best to prioritise/select activities that are directly associated with the measure. Because an EbA

the information captured in Form 5A for each measure/activity:

- short description of the activity (*e.g. capacity builpl6g 4m03≥16.2eir construt4( )Tj-14.696 -TJ0 Tgeal5002A0047emvelom4m03≥16046000D000056004D00457t457t45*

9. Validating EbA measures and ToC with stakeholders

the intervention area, identify key individuals and responsible agencies to engage in the implementation, develop a timeline for implementation, identify

each measure.

Outputs

1	Final concept note(s) for EbA measure(s)

In this step, the project team and stakeholders

Activities

1. Develop and refne indicators for each measure

for each EbA measure described (see Form 5A) and for the overall impact, to support monitoring and evaluation.

and serve as a tool to assess whether the EbA measure is achieving its intended goal. Indicators should cover key aspects of the results chains

activities need to be implemented; what outputs need to be delivered; what immediate and

and how do the outcomes contribute to the overall impact from EbA.

project team should consult with local community

the indicators.

It is recommended that the team develop an indicator table that can be used to set out all of the indicators, and to identify for each what methods and data sources will be used, frequency of data

there are any indicators that are duplicated/ overlapping, and whether any will not be practical

or lack of data. At this stage, the project team should

methods (e.g. involving communities or other stakeholders in data collection, analysis and evaluation) and ways to link up or streamline the

area.

Often its sustainability can be overlooked in project design and timelines, therefore it is essential to

ensuring that local stakeholders, who live near the

measure, and second it can provide an opportunity to continue to involve them in the EbA process, further building a sense of ownership and allowing

Box 6

Output indicator:

reconnected to the river system

o Number of people (men, women) employed

o Number of local government officials

Immediate outcome indicator:

reconnection

Intermediate outcome indicator:

households, before and after reconnection

species

Am+`cIcrr - rp_bc+m.l gIbga_rmp8

o Level of engagement (number of person

key stakeholder groups (potential governance

<u>Form 6A: Indicator table</u>

2. Develop an M&E plan and provide capacity building on M&E

In addition to defining the indicators and

plan: this can be a short document which sets out

such as:

• Any training, capacity building and equipment

• Key milestones, e.g. if the project will involve

workshops, etc

indicators), and frequency of data collection

such as stakeholder/household surveying, any

studi d(conomic valuaeque)2 f13.509 j/etc)/etc6j>2 f0.01 w /

any capacity needs and planned capacity building,

include capacity building for the project team, but ideally will also cover capacity building for community members, local government or other

3. Consultation and information sharing for M&E

consultation and stakeholder feedback, and set out how you plan to communicate and share the results

evaluation processes that are required for the EbA

It should also take into account the most appropriate channels for communication with local stakeholders, including the use of local languages. It is recommended that the team organises a consultation with community

the measures, to understand how the EbA solution

Adaptive management process

evaluation or review processes that consider what changes may be needed to increase positive impacts and reduce any negative impacts. Options to support adaptive management include:

- Including recommendations for adaptive evaluations or reviews of the measures
- Ensuring that any consultation processes for review of the EbA measures include discussion of steps to improve the measures / adaptive management

Outputs

1	Indicator table including methods

Additional resources:

document

conservation projects

and quality standards

evaluation systems

Step 7:
Implementing EbA Measures

Objective:

Step 8:

Objective: Identify and document the key lessons learned from the implementation of the EbA measure, and share them with relevant government agencies to trigger policy change.

adaptation.

6 should be disseminated amongst relevant decision

sector. Increasing visibility of EbA amongst policy makers can help to build momentum for EbA approaches, and potentially gain access to

comparison to highlight the implementation and maintenance costs of EbA measures compared to traditional grey infrastructure.

It is also important to highlight links between EbA and local or regional economic development

avoided damage to agriculture or infrastructure due

Outputs

1	

Additional resources

How to integrate climate change adaptation in to national-level policy and planning in the water sector

Bibliography

International Journal of Water Resources Development

T_jsyle rfc @clcrrq Amqrq _lb Gkn_arq md Camqwqrck+`_qcb ?b_nr_rymI Kc_qspcq8 ? sourcebook of methods for decision-making*. GIZ: Bonn, Germany.

Solutions in Focus: Ecosystem-Based Adaptation from Mountains to Oceans. How people adapt to climate change by using nature. Bonn and Eschborn.

Guidebook for Monitoring and Evaluating Ecosystem-based Adaptation Interventions. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Bonn, Germany.

Germany.

Annex 1

Level 1	Level 2		Level 3	
Agricultural land	A1	Filed crop	A100	
			A101	Kenaf, Jute
				Black bean, Red bean
				Upland rice
				Jam potato
				Ginger
				Agave
				Barley
				Rye
				Opium

Level 1	Level 2		Level 3	
				Roselle
	A3		A300	Abandoned perennial
			A301	
			A303	Oil palm
				Eucalyptus
			A305	
			A306	
				Acacia
			A309	
			A310	Gmelwa sp.
			A311	
			A313	
			A315	Bamboo
			A316	Kapok
				Betel palm
				Rain tree
			A319	
				Indian mahogany
				Agalloch
		Orchard		Abandoned orchard
				Orange
				Durian
				Rambutan
				Litchi
				Jujube

Level 1	Level 2		Level 3	
				Banana
				Longan
				Guava
				Jack fruit
				Rose apple
				Langsat
				Lime
				Elaeocarpaceae
				Dragon fruit
				Burmese grape
	A5	Horticulture	A500	Horticulture
			A501	
			A503	Floricultural/Ornamental plant
			A505	
			A506	
				Raspberry
			A509	Herbs
			A510	Grass plantation
			A511	Rattan
			A513	Okra

Level 1	Level 2		Level 3	
				Asparagus
			A515	
	A6		A600	Bush fallow
			A601	
			A603	
			A605	
			A606	
			A609	
			A610	
			A611	
				cultivation)
			A613	
			A615	
			A616	
			A619	
			A630	
			A631	

			A633	
			A635	
			A636	Abandoned farm house
				and farm house
				Reed
				Lotus
	A9		A900	Abandoned aqua cultural land
			A901	Fish farm
			A903	
			A905	
	A0		A001	
Forest land	F1	Evergreen forest	F100	Disturbed evergreen forest
			F101	Dense evergreen forest
		Deciduous forest		Disturbed deciduous forest
				Disturbed deciduous forest
	F3		F300	Disturbed mangrove forest
			F301	Dense mangrove forest
				Disturbed swamp forest
				Dense swamp forest

Level 1	Level 2		Level 3	
	F5	Forest plantation	F500 F501	Disturbed forest plantation Dense forest plantation
	F6	Beach forest	F600 F601	Disturbed beach forest Dense beach forest
		Natural water body		River, canal Lake, lagoon Ocean Reservoir Farm pond Irrigation canal
		Other miscellaneous land		Grass Giant thorny bamboo Landslide Rock out crop
		Beach Garbage dump		Beach Garbage dump

Forms for the Guidebook for the Design and Implementation of Ecosystem-based Adaptation in River Basins in Thailand

Step 1: Stocktaking and Planning

Form 1A: List of core project team members and roles

Number	Name	Gender	Role in the Project Team	Area of Expertise
1				
3				
5				
6				
9				
10				

Form 1B: Literature review results

Basin name and focal area:	
Team member completing form:	
Date form completed:	

Key Questions	Information collected	Additional data sources/links
Community and land use		
Have there been previous consultations		
agencies, local communities, minority private sector partners (to be developed		
Are they any recent land use maps for		
Biodiversity and natural resources		

Climate change projections and relevant measures		
Have any grey or green water management measures previously been		
Plans influencing the site		
E.g. river basin plans, plans from		

Form 1C: Stakeholder analysis

1. Government agencies
   a. Local level

   c. National level

3. Local communities

   f. Religious groups

Stakeholder Name *(e.g. Youth group)*	Contact Person *(Phone, email, address)*	Influence *How can they ßlrsclac rfc project and how ksaf ßlrsclac do they (low, medium high)?*	What are the stakeholder's priorities? *(e.g. water availability)*	How could the stakeholder contribute to the project? *(e.g. helping to identify potential restoration areas)*

Form 1D: Initial Community Workshop

Key Questions	Interview Results
Understanding current climate change impacts and coping mechanisms	
Understanding future climate change impacts and disaster response	
Ecosystems, ecosystem services and biodiversity	
Are there any species of importance (endemic, endangered,	
Have there been any changes in key species that are connected	

Form 1E: Example agenda for a one-day consultation workshop with stakeholders and preliminary capacity building needs assessment

09:00-09:30	Opening remarks and introduction to the objectives of the workshop, round of stakeholder and project team introductions
09:30-10:00	
10:00-10:30	Group discussion on literature review and additional resources and information
10:30-10:45	
10:45-12:00	
12:00-13:00	Lunch
13:00-13:30	
13:30-14:30	
14:30-15:15	
15:15-16:00	

Form 1F: Prel]

Topic *(e.g. biodiversity survey)*	Skills Needed *(e.g. ability to gbc I rgdw jma_j [rmp_ and fauna)*	Methods to build capacity *(e.g. training from NGOs)*	Timeframe required *(e.g. 3 weeks)*	Lead team member responsible	Priority *(Low, medium, high)*

Form 1G: Drafting a preliminary EbA vision

Key questions	Proposed answers

Form 1H: Template for five page summary

1. Introduction to the basin
    a. Location
    b. Land use
    c. Biodiversity, ecosystem services and environment

        1) Key livelihoods

        factors
    e. Hydrological data

    a. Historical data

3. Key data gaps

    a. Ongoing or future development plans

    c. Relevant natural resource management policies

    a. Key stakeholder groups and roles

        mechanisms

        group

Step 2: Conduct a Climate Risk Vulnerability Assessment

Form 2A: Summary of key vulnerabilities highlighted in the CRVA

Questions	Information collected
Climate data	
Describe the seasons in the study area, including high and low	
Are there records of changes in weather patterns and	

Questions	Information collected
Non-climatic stressors	
(e.g. encroachment, waste disposal, poaching)	
Impacts of climate change and other stressors on ecosystems, communities and livelihoods	

Step 3: Mapping the ecosystems and assessing ecosystem services

Form 3A: Rapid ecosystem services assessment for river basins

Guidance on Form 3A: One form should be completed for each ecosystem assessed. Ecosystem services should focus mainly on provisioning and regulating services, as these will be the most important services for increasing climate change each ecosystem service should be assessed using the following scale:

be also be assessed; they may be less relevant in the EbA development process, but can be important

0 Ecosystem services that provide a negligible

are unsure, or lacking data on.

Key Importance ++ Significant positive benefit + Positive benefit 0 Negligible benefit ? Gaps in evidence	Ecosystem assessed: GPS Coordinates Date: Facilitator:				
	Importance and Users	Local (L), Regional (R), Global (G)	Increasing (I), Decreasing (D) (U) Unknown	List climate threats	List threats
Freshwater					
Aquaculture					
Agriculture					
Fiber					
Fuel					
Biodiversity					

	Erosion regulation					
	Fire regulation					
	Recreation, tourism and aesthetic value					
	Education and research					
	Nutrient cycling					
	Fire regula15 curism aGroundwaterfTchargetion a12436904002c0 06360 7 I/R d(Reng services d 0.052 w 13 90.					

Form 3B: Example agenda for a one-day consultation on ecosystem mapping and ecosystem services assessment

09:00-09:30	Opening and project updates
09:30-10:30	Introduction to EbA and ecosystem services
10:30-10:45	
10:45-12:15	Breakout groups: Ecosystem services assessment (Form 3A) and mapping
12:15-13:15	Lunch
13:15-15:00	ecosystem services to conserve or restore (Form 3)
15:00-15:30	

Step 4: Developing an EbA vision

Form 4A: Guiding questions for developing an EbA vision with stakeholders

Component
Developing an EbA approach

Form 4B: Example agenda for a one-day consultation on EbA Visioning

09:00-09:30	Opening remarks and updates on the project since the last consultation
09:30-10:00	Introduction to EbA visioning: purpose and approach
10:00-10:15	
10:15-12:00	Breakout groups: Developing an EbA vision with stakeholders
12:00-13:00	Lunch
13:00-15:00	groups
15:00-15:30	

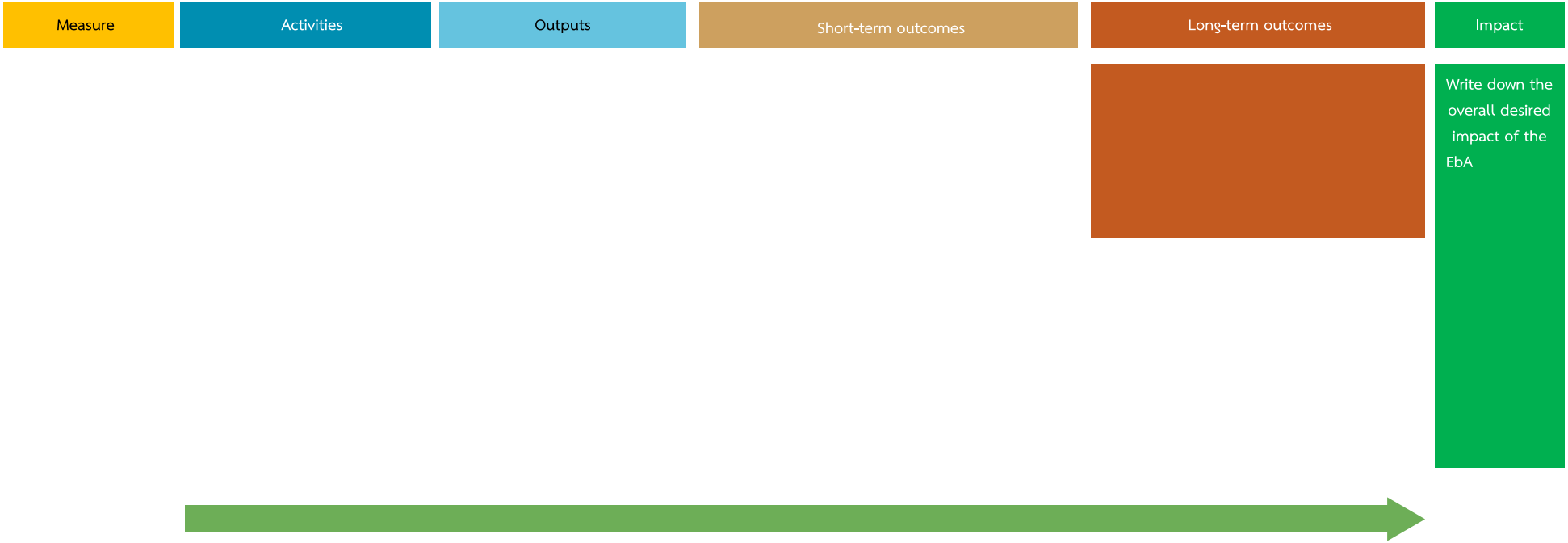
Step 5: Developing a Theory of Change to identify and validate EbA measures

Form 5A: Concept note for selected EbA measures

1	Measure description		
	Name of the measure		
	Overall description of the measure (technical intervention and summary of outcomes)		
	Baselines, vulnerability assessments, or technical studies that are already available of the measure		
	  coordinates) and area covered by the intervention		
1.9	Activities linked to the measure	Description	Key Outputs
	Activity 1 title		
	Activity 3 title		
1.10	Risks and assumptions		

2	Measure Implementation
	Lead implementer
	Implementing partner(s)
	Relevant local government partners and their roles *(whether directly or indirectly involved)* and description of involvement
	Additional partners and their roles *(community, non-government mpe_lgx_rgmlq* mrfcp emtcplkclr n_prlcpq* cra,'*
	Implementation timeline for the measure
3	Sustainability
3.1	
	Financial sustainability
3.3	Integration within policy and planning

Form 5B: ToC Guidance



Form 5C: NbS Criteria Assessment

by scale		recognises and responds to the interactions between the economy, society and ecosystems	between the economy, Does that include those within and surrounding the change in these interactions on and from other areas interactions used to design the intervention and recognises and responds to the	

Criteria	Indicators		Guiding questions	Answers from the team
in net gain to biodiversity and ecosystem integrity	*3.2*	biodiversity conservation benchmarked and periodically assessed	Are clear and measurable biodiversity conservation these outcomes based on an understanding of the Are these outcomes applicable to the relevant period of time for the benchmarks for desired conservation outcomes	
	3.3	periodic assessments for unintended adverse consequences on nature	Is a monitoring and assessment plan in place for ecosystems, species Is the monitoring plan based around measurable variables related to potential adverse impacts on nature arising from the response to those impacts plan properly implemented with measurements taking	

Criteria	Indicators		Guiding questions	Answers from the team
economically viable	*4.2*	study is provided to support the choice of impact of any relevant regulations and subsidies	include upfront and recurring direct and indirect costs as well as assumptions of include measuring the impact of any relevant Does the study support the choice of actions for sensitivity analysis conducted against	
	4.3	against available alternative solutions, taking into account any	Are available alternative against available Are associated	

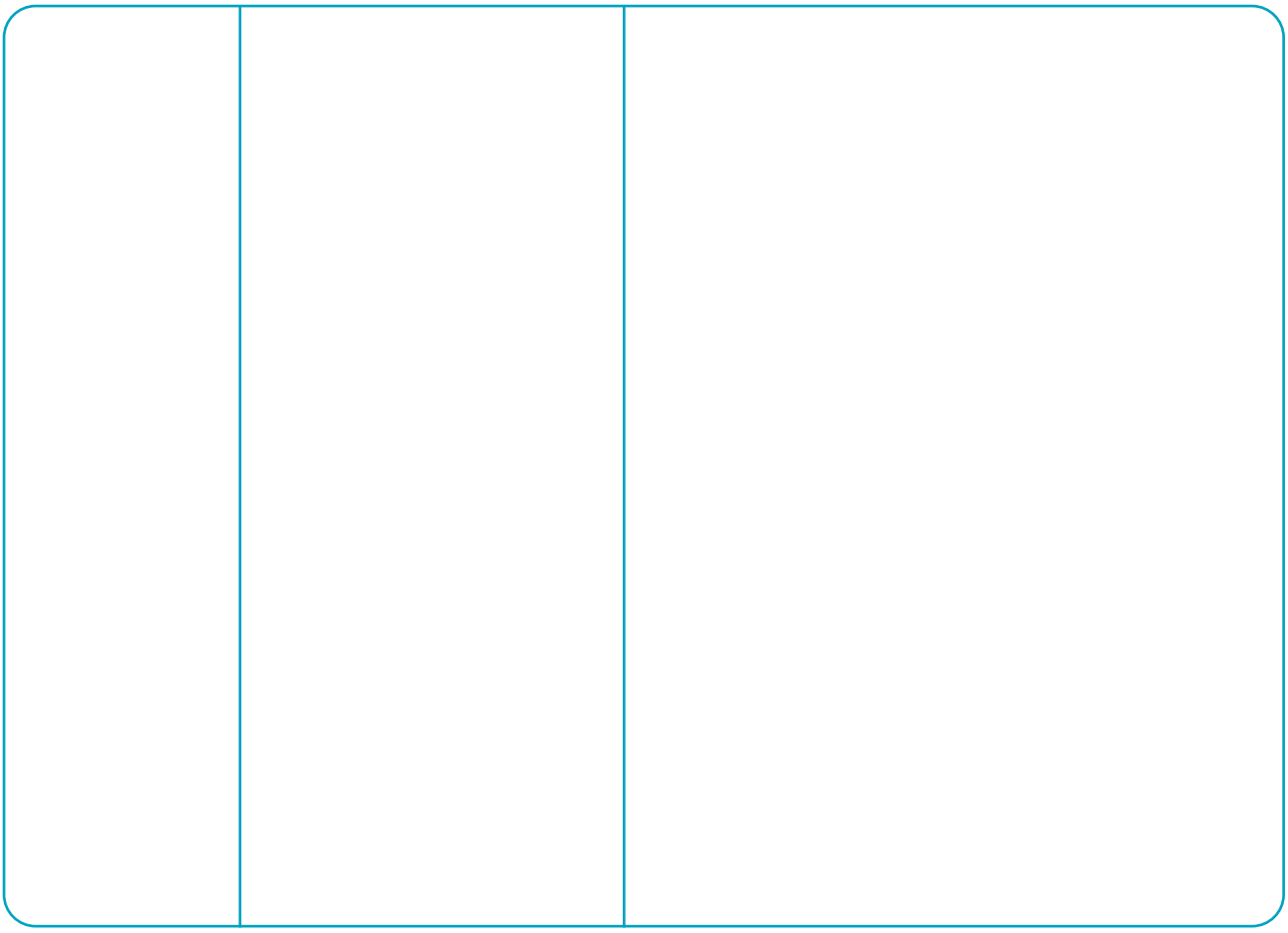
Criteria	Indicators		Guiding questions	Answers from the team
based on inclusive, transparent and empowering governance processes	*5.4*	processes document and respond to rights and interests of all participating and	processes being documentation transparent respond to the rights and interests of all participating to stakeholders subject to	
	5.5	jurisdictional boundaries, mechanisms are established to enable among the stakeholders in those jurisdictions	Do ecological processes and functions of the ecosystems in the beyond jurisdictional enabled among the Are transboundary stakeholders in all	

Criteria	Indicators		Guiding questions	Answers from the team
balances between achievement of their primary goal(s) and the continued provision of	*6.1*	acknowledged and inform safeguards and any appropriate corrective actions	and the larger landscape/ seascape, throughout Are they used to inform used to inform corrective actions if those Is the process of	
	6.2	and access to land and resources, along with the responsibilities of are acknowledged and respected	Are the rights, usage of and access to land and resources as well as stakeholder responsibilities incorporated into a stakeholder mapping acknowledged and inform the design of the	

balances between achievement of their primary goal(s) and the continued provision of	*6.3*	Established safeguards are periodically reviewed to ensure respected and do not destabilise the entire	Are there mutually agreed and are they being established safeguards in place to prevent these destabilising the entire ecosystem or land/ safeguards being clear documentation of safeguards and their	
are managed adaptively, based on evidence		established and used as a basis for regular monitoring and evaluation of the intervention	Is there a strategy for the intervention for how societal challenges will be strategy precisely state intended outcomes, actions and assumptions in regards to economic, social and ecologo ecn ecologo ecn ecolo1400560051004400500(	

Criteria	Indicators		Guiding questions	Answers from the team
are managed adaptively, based on evidence	*7.2*	A monitoring and evaluation plan is developed and implemented throughout the intervention lifecycle	Is there a robust monitoring and evaluation implemented throughout the lifecycle of the plan include how deviations of the strategy trigger an adaptive	
	7.3	A framework for iterative learning that enables adaptive management is applied throughout the intervention lifecycle	Is there a plan to learn and adapt in response to the monitoring and learning framework applied learning throughout the Does this enable adaptive strategy for how learning persists beyond the time	

Criteria	Indicators		Guiding questions	Answers from the team
sustainable and mainstreamed within an appropriate jurisdictional	*8.1*	implementation and lessons learnt are shared for triggering transformative change	implementation and lessons learnt being Are they being shared both on demand and with this sharing accessible to communication strategy in detail how communication will change behaviours and how this will trigger	
	8.2	enhance facilitating policy and regulation frameworks to support its uptake and mainstreaming	Are policy, regulations and laws relevant to the intervention being impacts and opportunities adopters and entry points interventions actions and communications informing or enhancing facilitating policy and regulation supporting uptake and	



Step 6: Developing a monitoring and evaluation framework for the EbA measures

Form 6A: Indicator table

Indicator	Indicator type	Indicator category / topic [9]	Summary of logic / assumptions / thresholds for indicator [10]	Summary of method/s to be used [11]	Proposed data sources
EXAMPLE: Number of community members trained in sustainable fsheries management who participate in fsheries management & cooperatives	Output	capacity	management is a key supporting activity for the EbA measure (wetlands restoration). conservation zones, etc, to complement wetlands restoration	1. Number of community members who participate in and complete training provided (total number men, total number women) community management committee and in (total number men, total number women) 1 that also appear annually	List of participants in training courses Lists of members of management committees

[9] (e.g. input, output, outcome)

fsheries	Outcome (intermediate)				

Form 6B: Summary table for review and adaptive management

Part 1 – summary of M&E results				
EbA measure	Expected outcomes / impacts	Indicators related to outcomes / impacts	Results / progress made to date	Changes/ alterations needed
Part 2 – Summary of progress towards EbA vision				
Component	Vision/ expectation for this component	Key M&E results related to this component	Progress made to date	Any steps to improve progress towards this component/ vision?

Step 7: Implementing EbA Measures

Form 7A: Delegation of tasks and timeline for implementation

Step #	Description Activity	Responsible partner	Duration

Timeline for EbA implementation

take place

Week/ Step	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15
1															
2															
3															
4															
5															
6															
7															

Step 8: Influencing policy

Form 8A: Policy opportunities and plans

	Policy opportunity	Responsible government department	Focal person in government	What needs to be done?	Steps to achieve goal	Deadline	Lead team member
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							