

# IUCN

## *Introduction to the BOAT*

*(Benefit Opportunities Assessment Tool):*

Overview and

A Multi-stakeholder Analysis of  
Benefit-enhancing Scenarios in  
the Takong Basin



IUCN Global Water Programme



### **Concept 1**

River basins offer different types of benefits that can be shared, vs. sharing the allocation of water

### **Concept 2**

Watersheds can be managed with decisions based on sharing benefits equitably among stakeholders

### **Concept 3:**

Opportunities for enhancing benefits can be identified jointly

### **Concept 4**

Several methods to value and distribute benefits and costs exist, with different data needs

### **Concept 5**

Negotiation based on benefit-sharing takes a win-win approach

### **Concept 6**

Implementation of benefit-sharing requires functional institutions



# Zoom in: Concept 3

## Concept 3:

Opportunities for enhancing benefits can be identified jointly

## Skill 3

Identify and build benefit enhancing scenarios using BOAT exercise

- **Presentation (non-cooperation scenario) and exercise (benefit-sharing scenario)**
- **Takong fictive scenarios**
- **Emphasis on multiple stakeholders**
- **Qualitative impacts and benefit enhancement opportunities**



NOTE: The examples used in this presentation (non-cooperation) and exercise (benefit-sharing) are simplified for educational purposes

Real-life situations will present higher complexity in terms of costs and benefits

# Description of the Takong Basin





# Two Countries





# Konfundesia: Geography and Climate





# Konfundesia's Biodiversity







# Konfundesia's Autonomous Regions & Cities



# Konfundesia's Agriculture & Industry





# Tourism in Konfundesia





# Akinonia: Geography & Climate





# Akinonia's Departments and Cities



# Akinonia's Agriculture & Industry





# Akinonia's Mining



# Tourism in Akinonia





# The Takong Basin







# Examining Qualitative Impacts on Stakeholders

- Water use activities may have **positive** or **negative** impacts (externalities) on other water users
- A first step consists in examining the balance of **positive** and **negative** impacts across different activities/sectors in a shared basin
- How can joint changes in water management enhance **benefits** for the most stakeholders and both riparian countries?

# Benefit Opportunities Assessment Tool (B.O.A.T.)

- a) **Non-cooperation scenario**
- b) Benefit-sharing scenario





The Takong Basin (exercise)

# a. Non-cooperation scenario (start)

1. The **hydropower** sector and the **city** of Estambay in Konfundesia derive benefits from the building of the **Edara Hydroelectric Dam**.

The costs associated with the reduced flows are borne by:

- the **hydropower** sector in Akinonia – in particular the Papyrus Dam found downstream;
- the **agricultural** sector in Konfundesia but also in Akinonia due to decreased flows for riverine habitats and saline water intrusion at the delta downstream;
- riverine **ecosystems** in both countries, which in Akinonia translates into costs for the **tourism** and **fishing** sectors due to reduced sediment (beach replenishment) and nutrient (fishery support) supply as well as in terms of threatened **cultural** sites due to increased erosion.

## Konfundesia and Akinonia projects NO COOPERATION

Water use activities	Stakeholders									
	Hydro K	Hydro A	Agri K	Agri A	City K	City A	Envt K	Tourism A	Fish A	Cult A
Hydropower production at Edara Dam	+	-	-	-	+		-	-	-	-



# a. Non-cooperation scenario (cont'd)

2. The **agriculture** sector and the **city** of Estambay in Konfundesia derive benefits from the **Biofuel Expansion in the Metis Region** which is expected to increase both energy security for transport and/or trade.

The costs associated with the reduced flows are borne by

- the **agricultural** sector in Akinonia due to increased pollution from e.g. fertilizers being carried downstream;
- the riverine **ecosystems** in both countries, which in Akinonia translates into costs for the **tourism** and **fishing** sectors due to the same land-based pollution issues around the coast.

## Konfundesia and Akinonia projects NO COOPERATION

Water use activities	Stakeholders									
	Hydro K	Hydro A	Agri K	Agri A	City K	City A	Envt K	Tourism A	Fish A	Cult A
Biofuel expansion in Metis			+	-	+		-	-	-	

# a. Non-cooperation scenario (cont'd)

3. The **hydropower** sector and the **city** of Styropolis in Akinonia derive benefits from expanding the **Papyrus reservoir**.

The costs associated with the flooding of the area upstream of the dam are borne by the **city** of Estambay (Konfundesia) in terms of restricted operations for the Tarpon Canal and increased water-related diseases.

The costs associated with the reduced flows are borne by

- the **agricultural** sector in Akinonia due to increased pollution from e.g. fertilizers being carried downstream;
- the riverine **ecosystems** in Akinonia i.e. downstream of the reservoir and that translates into costs for the **tourism** and **fishing** sectors due to reduced sediment (beach replenishment) and nutrient (fishery support) supply as well as in terms of threatened **cultural** (historical) sites due to increased erosion.

## Konfundesia and Akinonia projects NO COOPERATION

Water use activities	Stakeholders									
	Hydro K	Hydro A	Agri K	Agri A	City K	City A	Envt K	Tourism A	Fish A	Cult A
Hydropower production at Papyrus Dam		+		-	-	+		-	-	-



# a. Non-cooperation scenario (end)

In Akinonia under non-cooperation, the number of negative impacts on sector-specific stakeholders outweighs the number of positive impacts, whereas these are balanced out by the number of positive impacts on sector-specific stakeholders in Konfundesia.

Overall, stakeholders as a group in Akinonia and Konfundesia incur a large number of negative impacts or no positive impact from carrying out the different projects with no cooperation.

**However, note that relative valuation of benefits and costs for stakeholders remains to be determined.**

**Konfundesia and Akinonia projects  
NO COOPERATION**

Water use activities	Stakeholders										Net number of impacts per project
	Hydro K	Hydro A	Agri K	Agri A	City K	City A	Envt K	Tour A	Fish A	Cult A	
Hydropower production at Edara Dam	+	-	-	-	+		-	-	-	-	-5
Biofuel expansion in Metis			+	-	+		-	-	-		-2
Hydropower production at Papyrus Dam		+		-	-	+		-	-	-	-3
<b>Net number of impacts per stakeholder</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>-3</b>	<b>1</b>	<b>1</b>	<b>-2</b>	<b>-3</b>	<b>-3</b>	<b>-2</b>	

**Aggregated net number of negative impacts:Konfund 0**

**Akinonia-10**

As a group, stakeholders in Konfundesia incur a net number of 0 negative impacts

As a group, stakeholders in Akinonia incur a net number of 10 negative impacts

# B.O.A.T. EXERCISE

- a) Non-cooperation scenario
- b) Benefit-sharing scenario**

Groups/pairs:

1. ...
2. ...
3. ...



# b. With cooperation (b-s scenario) (partially filled out)

-> Fill out the empty cells in the spreadsheet based on the information on the following slides/relevant page on your handout

## WITH BENEFIT SHARING

Water use activities	Stakeholders										Net number of impacts per project
	Hydro K	Hydro A	Agri K	Agri A	City K	City A	Envt K	Tourism A	Fish A	Cult A	
Enlarged hydropower capacity at Edara Dam & reoperated											0
Biofuel expansion in Metis											0
Removal of Papyrus Dam & drainage of reservoir											0
Net number of impacts per stakeholder	0	0	0	0	0	0	0	0	0	0	

Aggregated net number of impacts: Konfundesia 0  
 on individual stakeholders (positive) ?  
 on individual stakeholders (negative) ?

Akinonia 0  
 on individual stakeholders (positive) ?  
 on individual stakeholders (negative) ?

## b. With cooperation (benefit-sharing opportunities)

1. Reoperating the Edara dam would not create new water for the **agriculture** sector in Konfundesia, which still bears the costs of this project together with Akinonia's **hydropower** sector, but would curb the problem of saline water intrusion at the delta for the **agriculture** sector in Akinonia. Reoperation would also provide the environmental water needed for the riverine **ecosystems** to go back to less degraded (prior-to-dam) conditions. In Akinonia i.e. downstream of the reservoir, these translates into benefits for the **tourism** and **fishing** sectors due to released sediment (beach replenishment) and nutrients (fishery support) as well as for the **cultural** (historical) sites of Gloria due to curbed erosion.
2. The biofuel expansion project in Metis is not considered as part of the cooperation efforts at this stage and no changes to the net negative impacts on sector-specific stakeholders are therefore to be reported.



## b. With cooperation (benefit-sharing opportunities)

3. Enlarging the hydropower capacity of the Edara Dam to provide for Akinonia's energy needs as well could in turn lead to the removal of the Papyrus Dam and consequently the drainage of the reservoir. The costs associated with this operation would be of course borne by the **hydropower** sector in Akinonia, but benefits would be derived for
  - The **agriculture** sector in Akinonia thanks to the new land freed up by the drainage of the reservoir;
  - The **city** of Estambay as the drainage of the reservoir would also eliminate restrictions to operate the Tarpon Canal and the risk of risk of water-related diseases;
  - The **hoteliers, fishermen** and **cultural** (historical) sites of Gloria thanks to the sedimentation mitigation measures.

# b. With cooperation (end) (benefit-sharing opportunities)

Under the cooperation scenario, for each country the number of positive impacts on sector specific stakeholders balances with or outweighs the number of negative impacts.

7 Stakeholders incur a larger number of positive than negative impacts; 2 stakeholders incur a larger number of negative impacts. Impacts for 2 stakeholders balance out.

**As a group, stakeholders from both countries are better off qualitatively relative to non-cooperation.**

## WITH BENEFIT SHARING

Water use activities	Stakeholders										Net number of impacts per project
	Hydro K	Hydro A	Agri K	Agri A	City K	City A	Envt K	Tour A	Fish A	Cult A	
Enlarged hydropower capacity at Edara Dam & reoperated	+	-	-	+	+		+	+	+	+	5
Biofuel expansion in Metis			+	-	+		-	-	-		-2
Removal of Papyrus Dam & drainage of reservoir		-		+	+	+		+	+	+	5
Net number of impacts per stakeholder	1	-2	0	1	3	1	0	1	1	2	

Aggregated net number of impacts:Konfund 4

Akinonia4

As a group, stakeholders in Konfundesia incur a net number of 5 positive impacts

As a group, stakeholders in Akinonia incur a net number of 1 positive impact

**Konfundesia and Akinonia projects  
NO COOPERATION**

Water use activities	Stakeholders										Net number of impacts per project
	Hydro K	Hydro A	Agri K	Agri A	City K	City A	Envnt K	Touris m A	Fish A	Cult A	
Hydropower production at Edara Dam	+	-	-	-	+		-	-	-	-	-5
Biofuel expansion in Metis			+	-	+		-	-	-		-2
Hydropower production at Papyrus Dam		+		-	-	+		-	-	-	-3
Net number of impacts per stakeholder	1	0	0	-3	1	1	-2	-3	-3	-2	

**Aggregated net number of negative impacts:Konfu 0**

As a group, stakeholders in Konfundesia incur a net number of 0 negative impacts

**Akinon-10**

As a group, stakeholders in Akinonia incur a net number of 10 negative impacts

**Impacts on individual stakeholders**

**in:Konfu**

2 Stakeholders incur a larger number of positive than negative impacts; 1 stakeholder incurs a larger number of negative impacts. Impacts for 1 stakeholder balance out.

**Akinon** 1 Stakeholder incurs a larger number of positive than negative impacts; 4 stakeholders incur a larger number of negative impacts. Impacts for 1 stakeholder balance out.

**Impacts on individual stakeholders overall:**

**3 Stakeholders incur a larger number of positive than negative impacts; 5 stakeholders incur a larger number of negative impacts. Impacts for 2 stakeholders balance out.**



## WITH BENEFIT SHARING

Water use activities	Stakeholders										Net number of impacts per project
	Hydro K	Hydro A	Agri K	Agri A	City K	City A	Envt K	Tourism A	Fish A	Cult A	
Enlarged hydropower capacity at Edara Dam & reoperated	+	-	-	+	+		+	+	+	+	5
Biofuel expansion in Metis			+	-	+		-	-	-		-2
Removal of Papyrus Dam & drainage of reservoir		-		+	+	+		+	+	+	5
Net number of impacts per stakeholder	1	-2	0	1	3	1	0	1	1	2	

**Aggregated net number of impacts: Konfun 4**

As a group, stakeholders in Konfundesia incur a net number of 5 positive impacts

**Akinon4**

As a group, stakeholders in Akinonia incur a net number of 1 positive impact

**Impacts on individual stakeholders**

2 Stakeholders in Konfun incur a larger number of positive than negative impacts. Impacts for 2 stakeholders balance out.

5 Stakeholders in Akinon incur a larger number of positive than negative impacts; 1 stakeholder in Akinon incurs a larger number of negative impacts.

**Impacts on individual stakeholders overall:**

**7 Stakeholders in Konfun incur a larger number of positive than negative impacts; 1 stakeholder in Akinon incurs a larger number of negative impacts. Impacts for 2 stakeholders balance out.**

Again, the incidence of negative impacts is less overall, but need valuation of benefits and costs to know exactly *how much* stakeholders are affected, in terms of derived benefits.

Also, what compensation mechanisms might help to lessen net negative impacts?

