



Benefit Sharing

Principles, concepts and applications

SESSION II



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Benefit Sharing

6 steps

1. Identifying stakeholders and equity issues
2. Identifying the array of benefits (existing and potential)
3. Building benefit enhancing scenarios
4. Quantifying costs and benefits from future scenarios
5. Negotiating benefits
6. Institutional agreements & implementation mechanisms



3. Building benefit enhancing scenarios



Building scenarios



- Scenarios can help in turning towards cooperation paths and approaches that could otherwise be missed or avoided.
- It is a story based on analysis and an understanding of current and historic trends and events.
- Scenario building helps to switch mind-sets from only one possible future towards a number of possible watershed development alternatives.
- They can provide knowledge on potential future events, presenting alternative images of these futures.



Building scenarios



Opportunities for enhancing benefits can be identified jointly

The preparatory work can include vision development, stakeholder workshops and post-workshop activities. Scenarios are built up by using a matrix. This matrix contains factors which are beyond our control (external factors). External factors are used to develop scenarios. Factors that are within our control (internal factors) can be applied to develop B.S. strategies.





Benefit sharing mechanisms

- ✓ Opportunities and mechanisms for B.S. will be context specific and must be adapted to the social, political, economic and environmental context.

Benefit
Sharing
Mechanisms

Knowledge sharing

Project design

Revenue allocations & financial arrangements

Institutional & policy development



EXERCISE

A Multi-stakeholder Analysis of
Benefit-enhancing Scenarios

BOAT

Benefit
Opportunity
Analysis
Tool

1. Introduction to fictional case
2. Non-cooperation scenario
3. Benefit-sharing Scenario
4. B.O.A.T. Exercise



The Takong basin





The Two Countries





Konfundesia: Geography & climate





Biodiversity in Konfundesia





Konfundesia's autonomous regions





Konfundesia's Agriculture & Industry





Tourism in Konfundesia





Akinonia: Geography & Climate



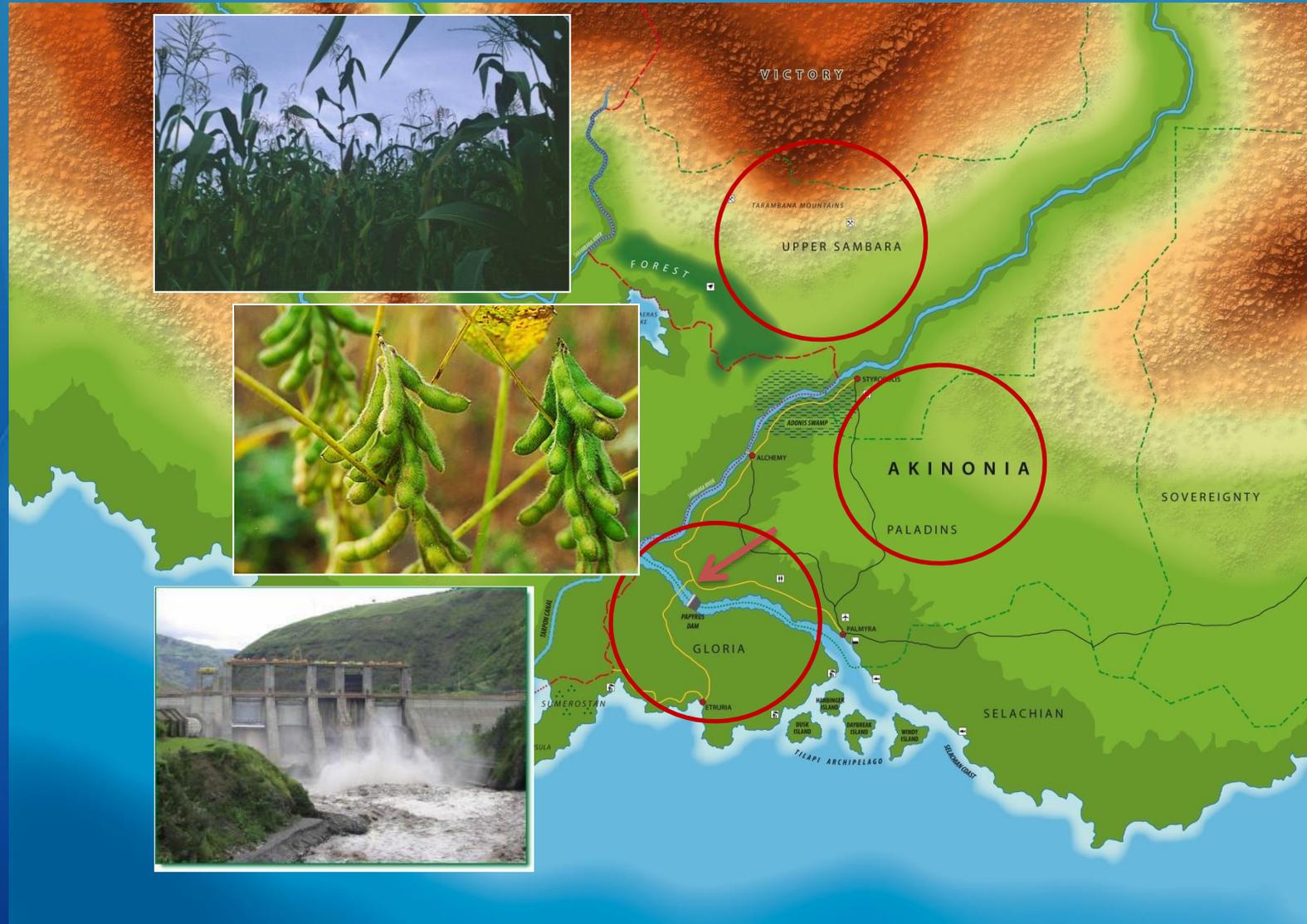


Akinonia's Departments and Cities





Akinonia's Agriculture & Industry



Akinonia's Mining





Tourism in Akinonia





The Takong Basin





NOTE: The examples used in this presentation and exercise are simplified for educational purposes

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



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?





a. Non-cooperation scenario (start)

1. Building of the **Edara Hydroelectric Dam**: The hydropower, tourism and urban sectors in Konfundesia derive benefits in the form of electricity generated.

The costs associated with reduced flows are borne by the

- hydropower sector in Akinonia – in particular the Papyrus Dam found downstream
- the tourism sector in Akinonia due to reduced sediment supply to the beaches of Gloria
- the agricultural sector in Konfundesia
- riverine ecosystems in both countries (= the environment).

QUALITATIVE IMPACTS WITH NO COOPERATION

Water use activities	Stakeholders												
	Hydro K	Hydro A	Agri K	Agri A	Tourism K	Tourism A	Rural K	Rural A	City K	City A	Mining A	Env K	Env A
Hydropower production at Edara Dam	+	-	-	+	+	-	+	+	+	+	-	-	-



a. Non-cooperation scenario (cont'd)

- Building of the **Upper Sambara Dam**: the hydropower and mining sectors in Akinonia, and the city of Styropolis with its metallurgic industry, derive benefits in the form of electricity generated.

The costs associated with degraded ecosystem health and livelihoods from reduced flows to the Adonis Swamp are borne by the rural sector and by the environment on both sides of the border. There are also costs associated with the reduced flows that are borne by the respective national agriculture sectors on each side of the river.

QUALITATIVE IMPACTS WITH NO COOPERATION

Water use activities	Stakeholders													
	Hydro K	Hydro A	Agri K	Agri A	Tourism K	Tourism A	Rural K	Rural A	City K	City A	Mining A	Envt K	Envt A	
Hydropower production at Upper Sambara Dam	+	+	-	-	+	+	-	-	+	+	+	-	-	



a. Non-cooperation scenario (cont'd)

4. **Mining in the nearby Tambara Mountains:** the city of Styropolis in Akinonia derives benefits (for manufacturing), and so does the mining sector.

The costs associated with increased pollution to the Adonis Swamp are borne by the rural sector and the environment on both sides of the border. These costs extend onto the tourism sector around the Chimaeras Lake.

QUALITATIVE IMPACTS WITH NO COOPERATION

	Stakeholders													
	Hydro K	Hydro A	Agri K	Agri A	Tourism K	Tourism A	Rural K	Rural A	City K	City A	Mining A	Envt K	Envt A	
Water use activities														
Mining in Tarambana Mountains					-		-	-		+	+	-	-	



a. Non-cooperation scenario (cont'd)

- 5. Conservation activities around the **Chimaeras Lake**: the environment, including biodiversity, in Konfundesia derives benefits, and so does tourism.

The costs associated with maintaining acceptable levels and quality of water in Lake Chimaeras are borne by the mining sector in Akinonia, by the city of Styropolis in terms of lost revenues from metallurgy, and by the agriculture sector in Akinonia in terms of lost revenues from timbering.

QUALITATIVE IMPACTS WITH NO COOPERATION

Water use activities	Stakeholders													
	Hydro K	Hydro A	Agri K	Agri A	Tourism K	Tourism A	Rural K	Rural A	City K	City A	Mining A	Envt K	Envt A	
Conservation in Chimaeras				-	+						-	-	+	



a. Non-cooperation scenario (end)

- In both countries under non-cooperation, the number of negative impacts on sector-specific stakeholders outweighs the number of positive impacts.
- Overall, stakeholders as a group in both Akinonia and Konfundesia incur a larger number of negative impacts from carrying out the different projects with no cooperation.

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

QUALITATIVE IMPACTS WITH NO COOPERATION

Water use activities	Stakeholders														Net number of impacts per project
	Hydro K	Hydro A	Agri K	Agri A	Tourism K	Tourism A	Rural K	Rural A	City K	City A	Mining A	Envt K	Envt A		
Hydropower production at Edara Dam	+	-	-	-	+	-	-	-	+	-	-	-	-	-2	
Hydropower production at Upper Sambara Dam	-	+	-	-	-	-	-	-	+	+	-	-	-	-3	
Expansion of Papyrus Dam for hydropower	-	+	-	-	-	-	-	-	-	-	-	-	-	-3	
Mining in Tarambana Mountains	-	-	-	-	-	-	-	-	+	+	-	-	-	-3	
Conservation in Chimaeras	-	-	-	-	+	-	-	-	-	-	-	+	-	-1	
Conservation in Gloria	-	-	-	-	+	+	-	-	-	-	-	-	+	0	
Net number of impacts per stakeholder	0	0	-2	-3	1	-1	-2	-2	0	1	1	-2	-3		

Aggregated net number of negative impacts:
Konfundesia -5
Akinonia -7

As a group, stakeholders in Konfundesia incur a net number of 5 negative impacts
As a group, stakeholders in Akinonia incur a net number of 7 negative impacts



b. With cooperation (benefit-sharing opportunities)

1. The hydropower sector in Konfundesia could **sell some of the power generated by the Edara Dam** to the city of Styropolis and to the mining industry in Akinonia.
2. Consequently, **the Upper Sambara Dam will no longer be needed** by Styropolis to support its metallurgical industry, saving construction and operations costs.
3. Akinonia would in turn **redesign the Papyrus Reservoir expansion project** to eliminate restrictions to operations for the Tarpon Canal and the risk of water-related diseases in Konfundesia (with avoided costs in terms of reduced navigation and public health for the city of Estambay).

This new design has benefits for Akinonia as well since sedimentation mitigation measures in the reservoir would start to replenish the beaches downstream, with avoided costs for the hoteliers of Gloria.



b. With cooperation (benefit-sharing opportunities)

4. Akinonia would also implement **pollution mitigation measures in its mining operations**, benefitting the tourism sector in Konfundesia and the conservation of lake Chimaeras, and neutralizing negative impacts on the rural sector in both countries.
5. (No change to conservation activities in Chimaeras Lake)
6. (No change to conservation activities in Gloria)
7. Finally, to compensate the loss of peak power for the city of Styropolis and its mining industry, Akinonia deploys a **wind farm in the Seals Peninsula**. This has a negative impact on the value of the cultural (historical) sites of the Sumerostan civilization.



b. With cooperation (benefit-sharing opportunities)

QUALITATIVE IMPACTS WITH BENEFIT-SHARING

Water use activities	Stakeholders													Number of net impacts per project	
	Hydro K	Hydro A	Agri K	Agri A	Tourism K	Tourism A	Rural K	Rural A	City K	City A	Mining A	Envt K	Envt A		Cult A
Hydropower production at Edara Dam with reoperation	+	-	-		+	-			+	+	+	-	-		0
Hydropower production at Upper Sambara Dam															0
Expansion of Papyrus Dam (w/improved operations)		+		-		+		+							2
Mining in Tarambana Mountains with pollution mitigation					+		+	+		+	+	+	+		7
Conservation in Chimaeras				-	+					-	-	+			-1
Conservation in Gloria	-	-				+							+		0
Wind Farm in Sumerostan Peninsula									+	+				-	1
Net number of impacts per stakeholder	0	-1	-1	-2	3	1	1	1	2	2	2	1	1	-1	

Aggregated net number of impacts:

Konfundesia	6
Akinonia	3

As a group, stakeholders in Konfundesia incur a net number of 2 positive impacts

As a group, stakeholders in Akinonia incur a net number of 2 positive impacts



QUALITATIVE IMPACTS WITH NO COOPERATION

Water use activities	Stakeholders														Net number of impacts per project	
	Hydro		Agri		Tourism		Rural		City		Mining		Envt			
	K	A	K	A	K	A	K	A	K	A	A	K	A	K		A
Hydropower production at Edara Dam	+	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-2
Hydropower production at Upper Sambara Dam	-	+	-	-	-	-	-	-	-	+	+	-	-	-	-	-3
Expansion of Papyrus Dam for hydropower	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-3
Mining in Tarambana Mountains	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-3
Conservation in Chimaeras	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-1
Conservation in Gloria	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	0
Net number of impacts per stakeholder	0	0	-2	-3	1	-1	-2	-2	0	1	1	-2	-3	-3	-3	

Aggregated net number of negative impacts:
 Konfundesia -5
 Akinonia -7

As a group, stakeholders in Konfundesia incur a net number of 5 negative impacts
 As a group, stakeholders in Akinonia incur a net number of 7 negative impacts

QUALITATIVE IMPACTS WITH BENEFIT-SHARING

Water use activities	Stakeholders															Number of net impacts per project	
	Hydro		Agri		Touris		Rural		City		Mining			Envt			Cult
	K	A	K	A	m K	m A	K	A	K	A	A	Envt K	Envt A	Cult A			
Hydropower production at Edara Dam with reoperation	+	-	-	-	+	-	-	-	+	+	+	-	-	-	-	0	
Hydropower production at Upper Sambara Dam	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
Expansion of Papyrus Dam (w/improved operations)	-	+	-	-	+	-	-	-	+	-	-	-	-	-	-	2	
Mining in Tarambana Mountains with pollution mitigation	-	-	-	-	+	-	+	+	+	+	+	+	+	+	+	7	
Conservation in Chimaeras	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-1	
Conservation in Gloria	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	0	
Wind Farm in Sumerostan Peninsula	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	1	
Net number of impacts per stakeholder	0	-1	-1	-2	3	1	1	1	2	2	2	1	1	-1	-1		

Aggregated net number of impacts:
 Konfundesia 6
 Akinonia 3

As a group, stakeholders in Konfundesia incur a net number of 2 positive impacts
 As a group, stakeholders in Akinonia incur a net number of 2 positive impacts



b. With cooperation (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.

Overall, 9 Stakeholders incur a larger number of positive than negative impacts; 3(+1 new) stakeholders incur a larger number of negative impacts. Impacts for 1 stakeholder balance out.

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

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



Aggregated net number of qualitative impacts on stakeholders





B.O.A.T. EXERCISE

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

Groups:

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



Your job as a group:

- Using handout, map and excel sheet (1 sheet per group)
 - Fill in the BOAT matrix in tab 1: non-cooperation. Who wins, who loses?
 - Check your results in tab 2
 - Fill in BOAT matrix in tab 3: How do results change, *with* cooperation?
 - Check the chart in last tab



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.

Exercise: 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.

Exercise: 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.



b. With cooperation (benefit-sharing opportunities)

- 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.
- 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.

WITH BENEFIT SHARING

Water use activities	Stakeholders									
	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	+	-	-	+	+		+	+	+	+
Biofuel expansion in Metis			+	-	+		-	-	-	



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.



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.

Exercise: 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	Tourism 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: Konfundesia 0
Akinonia 13

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. 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	Tourism A	Fish A	Cult A	
Enlarged hydropower capacity at Edara Dam & reoperated	+	-	-	+	+		+	+	+	+	5
Biofuel expansion in Metis			+	-	+		-	-	-		-3
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:Konfundesia 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



Exercise: 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	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	

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	Touris m 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 qualitative impacts on stakeholders

