

# Development of IWRM Performance Indicators for African Transboundary Basins management



EU - China

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ACP-EU WATER FACILITY / ACTIONS IN ACP COUNTRIES  
Development of IWRM performance indicators for African Transboundary  
Basins management



# The project

## 4 project partners :

- **INBO**
- **ANBO - Technical Secretariat OMVS**
- **IOWater**
- **ECOLOGIC**

## 2 project sponsors :

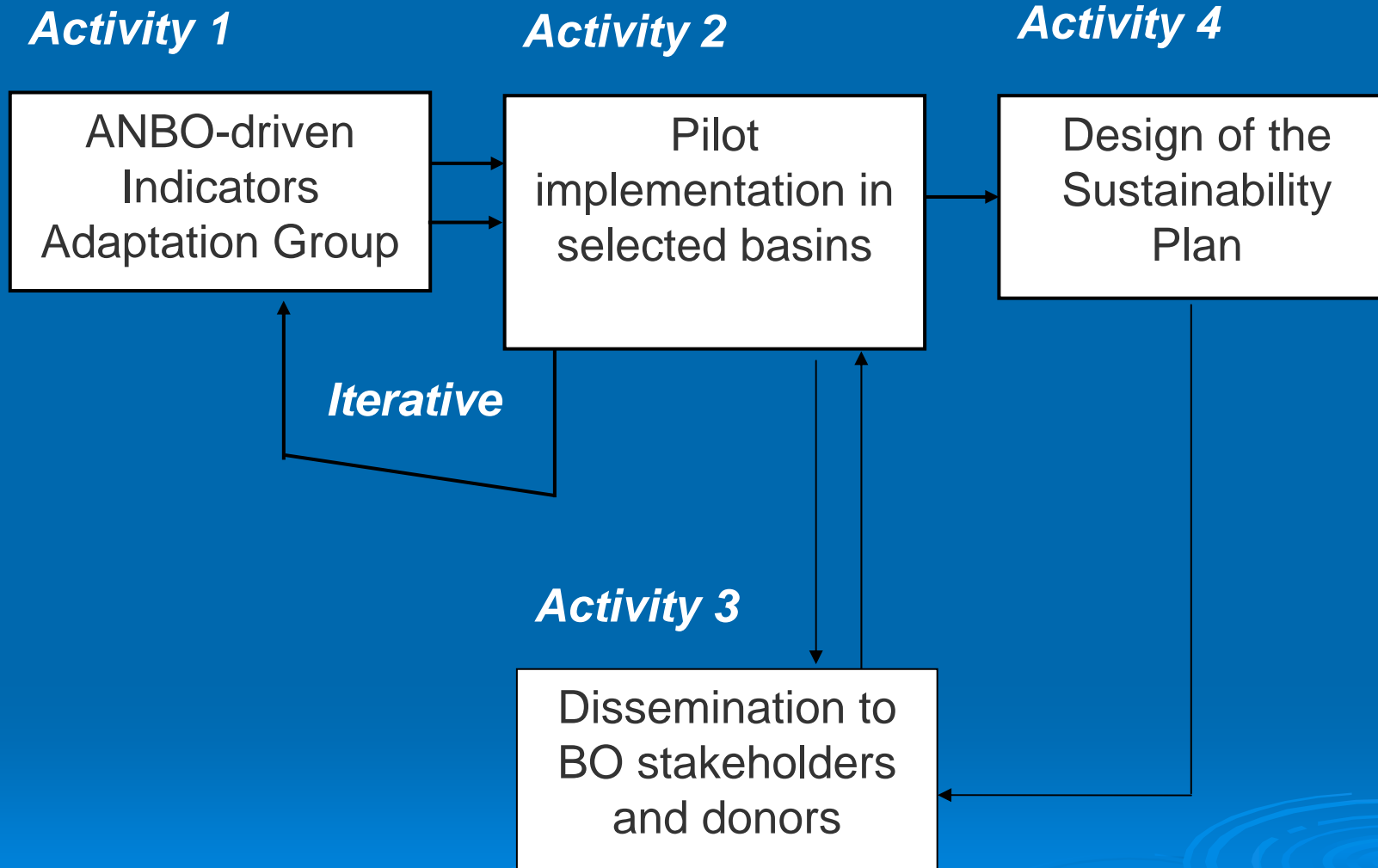
- **European Commission**
- **French Co-operation**

# Objectives of the project

**Developing and testing in the field Key Performance Indicators, adapted to design and monitor the implementation of Integrated Water Resources Management (IWRM) within African Transboundary Basins.**

**Experience will be transferable to main national basins around the world.**

# Main activities



Today, performance indicators are used on a regular basis, for example for governance of water and sanitation services.

During last years, some experiences were developed for using indicators at Basin Organisations levels for proposing monitoring criteria on IWRM

## **But what are good performance indicators ?**

**Tools for assessment, forecasting, and assistance in decision-making**

**Defined in compliance with pre-defined objectives**

**Quantitative data that allow to characterise and evolutive situation**

**Complemented by qualitative information and comments**

# Indicators for whom?

KPI project aims to develop an appropriate method for developing a common understanding based on Key Performance Indicators (KPI) to build the capacity of basin organizations, helping among other :

- Basin Committees to define appropriate objectives;
- BO management to design (River or Lake) Basin Management Plans and the associated Programmes of Measures by providing benchmarking ;
- Public participation to be active, by highlighting what is expected in terms of involvement ;
- BO stakeholders to monitor the BMP / PoM process ;
- Donors to assess the quality of work and the use of their funds.

# Indicators ? On What?

- Some performance indicators related to Institutional aspects:  
Governance, legal and institutional framework, organisation and missions of a basin organisation
- Some performance indicators related to results of policies and actions:  
technical, socio-economics, environmental ....



# TESTS ON PILOT BASINS



Senegal (OMVS),

Niger (ABN),

Congo (CICOS),

Orange-Senqu (ORASECOM),

Lake Victoria (LVBC).



Source: Oregon State: Transboundary Freshwater Spatial Database





**FUNDING INDICATORS**

11	Ongoing funding for basin management	Financing for river basin management exists and is ongoing despite changes in the administration of each riparian	0	0	0
12	Sufficient funding for basin management	Funding for river basin management is adequate to address at least priority natural resources management issues	0	0	0
13	Investment guidelines	Funding for river basin management operates within international investment guidelines which prescribe outcomes in transparency, accountability, benefit shares & sustainability (poverty reduction, economic development & environmental flows)	0	0	0
14	Investment accountability	There are explicit procedures in place which ensure transparent reporting of the results of investing in basin management programs	0	0	0
15	Donor coordination	Coordination between donor organizations exists to ensure programs and projects are linked, do not duplicate action and address common goals	0	0	0


FUNDING INDEX: 0

**REPRESENTATION INDICATORS**

16	Clear roles and responsibilities of riparians	There is clear specification of the roles and responsibilities of the stakeholders in each riparian in the institutional arrangements for basin management	0	0	0
17	Total membership	All riparians are members of the river basin organization	0	0	0
18	Membership specified in basin organization	There are procedures in place which specify membership and representation in the river basin organization	0	0	0
19	Water user participation in decision making	There are mechanisms in place whereby water users can participate in the decisions of river basin organizations	0	0	0


REPRESENTATION INDEX: 0

**MANAGEMENT STYLE INDICATORS**

20	Strong leadership in basin organization	There is strong leadership in the river basin organization and the leadership works to continuously upgrade the capacity of the RBO's staff	0	0	0
21	Realistic management	The roles, responsibilities and functions of the river basin organization reflect current realities rather than generic principles	0	0	0
22	Effective communication processes	There is an emphasis on communication, coordination and cooperation between stakeholders within the RBO to deliver outcomes	0	0	0
23	Priority setting	There is an emphasis on doing what is achievable first in the river basin organization	0	0	0


MANAGEMENT STYLE INDEX: 0

LEGAL INDICATORS

24	River basin organization legislation	Legislation specifies the functions, structure, financial base & accountability mechanisms for the river basin organization	0	0	0														
25	Use of legislation	This legislation not only exists but is practised	0	0	0														

LEGAL INDEX: 0

INFORMATION INDICATORS

26	Information management protocols	There is a process to specify the type of information needed, how it is presented and the timing of information exchange in the Information Management System of the RBO	0	0	0														
27	Integrated information management	Information is integrated on a spatial platform: a resource management atlas in a GIS provides basin wide and sub-basin environmental characteristics, problems and best management options	0	0	0														
28	Quality control in information management	The information management system is of uniform quality across the entire basin and accessible to all stakeholders	0	0	0														
29	Modelling and information management system used for prioritising best management options	The river basin organization uses information management systems and models to analyze and prioritize resource management options	0	0	0														

INFORMATION INDEX: 0

ADAPTIVE LEARNING INDICATORS

30	Research outcomes specification	The outcomes of technical projects are specified at sub-basin levels as best management options and are stored in an open-access (user-friendly) geographic information system	0	0	0														
31	Stakeholder participation in research	Stakeholders are used in technical studies to help set research goals and interpret results	0	0	0														
32	Adaptive-collaborative learning	There are procedures in place to learn from local experiences of using technical studies and apply them elsewhere in the basin	0	0	0														

ADAPTIVE LEARNING INDEX: 0

\* A riparian is a member country of a transboundary river basin organization

## Technical 2.1 Objectives and related indicators

Problem	General objective / specific objectives	Indicator	Source	Type	Comments	Unit	Source	
A. Risk of excessive exploitation of water resources	A.1. Increase the safety of the water supply to users; reduce leakage and bad usage through fixing efficiency objectives in each sector of use	Regulated volume compared to input flows	NBA proposition	E	V1: All large dams	%		
					V2: Shared large dams only	%		
		Assure water requirements for hydroelectricity	Water efficiency index for hydroelectricity	New				X p.89
		Assure water requirements for irrigation	Efficiency of irrigation water usage	Plan Bleu (57)	R	E1: physical efficiency of transport and distribution networks	%	X p.89
				R		%	X p.84	
		Assure water requirements for animal farming	Proportion of agricultural land irrigated	Plan Bleu (52)	P		%	X p.85
			Demand for agricultural water per irrigated hectare	Plan Bleu (53)	P		m3/year/ha	
		Assure water requirements for fishing	Density of operational water holes for animal farming	WRCU	S		No./km2	
			Efficiency of DWS	Plan Bleu (90)	R		%	X 132
		Assure water requirements for navigation	Fishing production by main groups of species	Plan Bleu (60)	S		T/year	X p. 93
	A.2. Save water	Water use efficiency	Plan Bleu (90 drinking water)	R	Proportion of distributed water paid by users	%	X p.132	
B. Risk of deterioration of water resources	B.1 Reduce pollution	General water quality index	Plan Bleu (87)	S		mg/l	X p. 125	
		Reduce pollution of industrial origin (mines and industries)	Industrial waste in water	Plan Bleu (63)	P		T/day	X p.97
			Intensive use of mineral raw materials	Plan Bleu (64)	S		T/USD	X p.98
	Reduce pollution of agricultural origin	Proportion of industrial wastewater treated on site	Plan Bleu (91)	R		%	X p.133	
		Use of fertiliser per hectare of agricultural land	Plan Bleu (51)	P		kg/ha	X p.82	
		Use of pesticide per hectare of agricultural land	Plan Bleu (50)	P		Kg/1000 ha	X p.81	
C. Risk of deterioration in populations' living conditions	C.1. Improve sanitation	Coverage rate of river basin's urban population with access to basic sanitation	MDG/ ECPWAS	S		%		
								From now to 2015 reduce by half the urban population of the river basin without access to sanitation (public, semi-public, private)
		Coverage rate of river basin's rural population with access to basic sanitation	MDG/ ECPWAS	S		%		
	From now to 2015, reduce by half the rural population of the river basin without access to sanitation (semi-public, private)							
		Proportion of wastewater collected and processed by public sanitation systems in urban environments	Plan Bleu (adapted) (88)	R		%	X p.128	
		Proportion of wastewater collected and processed by private or semi-public sanitation systems in rural environments	Plan Bleu (adapted) (88)	R		%	X p. 128	
		C.2 Improve drinking water supply for river basin residents	Proportion of the urban population with sustainable access to an improved water source	MDG/ ECOWAS	S		%	
	From now to 2015, reduce by half the urban population of the river basin that is deprived of regular access to drinking water							
	From now to 2015, reduce by half the rural population of the catchment area that is deprived of regular access to drinking water	Proportion of the rural population with sustainable access to an improved water source	MDG/ ECOWAS	S		%		

	<b>C.3. Anticipate natural risks</b>					
	Anticipate flooding risk (uncontrolled)	Number of sites at risk (flooding)	Plan Bleu (adapted) (118)	P		No. X p.170
		Economic impact of flooding	Plan Bleu (restriction) (119)	P		% X p.171
		Existence of intervention plans (flood risk)	Plan Bleu (121)	R		Yes/no X p. 173
	Anticipate risk of river bank deterioration	Number of sectors at high risk (deterioration of banks)	Plan Bleu (adapted) (118)	P		No.
	<b>C.4. Anticipate risks of conflict</b>					
	Conflicts of economic interest					
	Human conflicts (farmers)	Density of passageways to river for livestock using watercourse line	WRCU	S		No./linear km
<b>D. Risk of deterioration of the environment</b>	<b>D.1 Protection of renewable resources</b>	Index of use of renewable resources	Plan Bleu (84)	P		% X p.121
	<b>D.2 Protection of underground water resources</b>	Index of non-sustainable water production	Plan Bleu (85)	P		% X p.122
	<b>D.3 Protection of wetlands</b>	Surface area of wetlands	Plan Bleu (95)	S		Km2 X p.139
	<b>D.4 Protection of species and aquatic environments</b>	Minimum discharge level on specific node of the basin	NBA	R		m3/s

Type

S= State

P= Pressure

R= Response



## Technical 2.2 Feedback on indicators

Working document: towards the optimal use of indicators across Africa

Indicator	Code	Indicator use	Indicator assessment				Calculation period
			Pertinence	Simplicity	Reproducibility	Profitability	
Volume adjusted according to hydric potential	A.1.1	Rationalise water demand					Annual
Water efficiency index for hydroelectricity	A.1.2	Rationalise water demand					Annual
Efficiency of irrigation water	A.1.3	Significantly increase the added agricultural value per metre cube of water used					Annual
Proportion of agricultural land irrigated	A.1.4	Rationalise water demand					Annual
Demand for agricultural water per irrigated hectare	A.1.5	Rationalise water demand					Annual
Density of operational water holes for animal farming	A.1.6						Annual
Efficiency of DWS	A.1.7	Rationalise water demand					Annual
Fish production by main groups of species	A.1.8						Annual
Water use efficiency	A.2.1	Rationalise water demand					Annual
General water quality index	B.1.1						Annual
Industrial waste in water	B.1.2						Annual
Intensive use of mineral raw materials	B.1.3						Annual
Proportion of industrial wastewater treated on site	B.1.4						Annual
Use of fertilizer per hectare of agricultural land	B.1.5						Annual
Use of pesticide per hectare of agricultural land	B.1.6						Annual
Coverage rate of river basin's urban population with access to basic sanitation	C.1.1	Pursue the aim of reaching the Millennium Development Goals (MDG) for access to drinking water and sanitation					Annual
Coverage rate of river basin's rural population with access to basic sanitation	C.1.2						Annual
Proportion of wastewater collected and processed by public sanitation systems in urban environments	C.1.3						Annual
Proportion of wastewater collected and processed by private or semi-public sanitation systems in rural environments	C.1.4						Annual
Proportion of the urban population with sustainable access to an improved water source	C.2.1	Pursue the aim of reaching the Millennium Development Goals (MDG) for access to drinking water and sanitation					Annual
Proportion of the rural population with sustainable access to an improved water source	C.2.2						Annual
Number of sites at high risk (flooding)	C.3.1						Annual
Economic impact of flooding	C.3.2						Annual
Existence of intervention plans (flood risk)	C.3.3						Annual
Number of sites at high risk (deterioration of banks)	C.3.4						Annual
No. of passageways to river by riverbank line	C.4.1						Annual
Index of use of renewable resources	D.1.1						Annual
Index of non-sustainable water production	D.2.1						Annual
Surface area of wetlands	D.3.1						Annual
Respect of instream flow	D.4.1						Annual

### Indicator assessment (marked from 1 to 5)

- \_ pertinence (must respond to a problem),
- \_ simplicity (of conception, implementation & representation),
- \_ reproducibility (to allow follow-up over time),
- \_ profitability (must not incur over-high costs).

Category A. Risk of excessive exploitation of water resources  
**A.1. Increase the safety of the water supply to users**

**Indicator: Regulated volume compared to input flows**

***Definition:***

The indicator is based on two sub-indicators:

- V1: volume regulated by all dams
- V2: volume regulated by all shared large dams.

Large dams refer to criteria used in the World register of Dams from the International Commission on Large Dams (ICOLD):

- \* Height > 15 m or
- \* Height > 10 m and crown length > 500 m or
- \* Memory space > 1 million m<sup>3</sup> or
- \* Calculation floods > 2000 m /s.

***Unit:***

Percentage

***Methodological indications:***

V1 = Sum of volume for all large dams / Mean annual input flows

V2 = Sum of volume for shared large dams / Mean annual input flows

Shared dams are those managed by an International (supra-national) Organisation of Basin management.

***Data sources that have been identified and are possible:***

*To be defined*

***The indicator's geographical coverage:***

*Transboundary basin*



# Preliminary lessons learnt

Which institutional context ?

The PI system works better for an existing transboundary RBP, rather than a broad emerging collaborative process which has no organizational format.

The goal is to reach a system with significant benefits and little time-consuming: pragmatic, in line with local realities, iterative – feed back.

# Preliminary lessons learnt

Benchmarking or reporting on assessment of policy implementation?

Importance of synergies with internal reporting process within the RBOs.

Performance Indicators must correspond to Basin Organisation objectives and reporting process.

## Preliminary lessons learnt

### Data availability and easiness to fill-in the PIs ?

Having a high number of performance indicators but not being able to fill them seemed not to be appropriate to some basin organisations.

In regards of data existence, availability or simply because of time consumption and internal resources of the RBOS.

Some basins yet decided to start with light and pragmatic sets of indicators that won't require too many efforts in order to fill-in and to extend them on a later stage.

# Preliminary lessons learnt

## Synergies with other African basin initiatives?

Importance of fostering exchanges and experience feedback in that matter at Pan-African level.

Attention will be paid on associating other basins, thanks to institutions like African Network of Basin Organizations (ANBO).

The importance of finding synergies with the activities on Information Systems in Africa have also been underlined.

Replication / adaptation in other international and national contexts