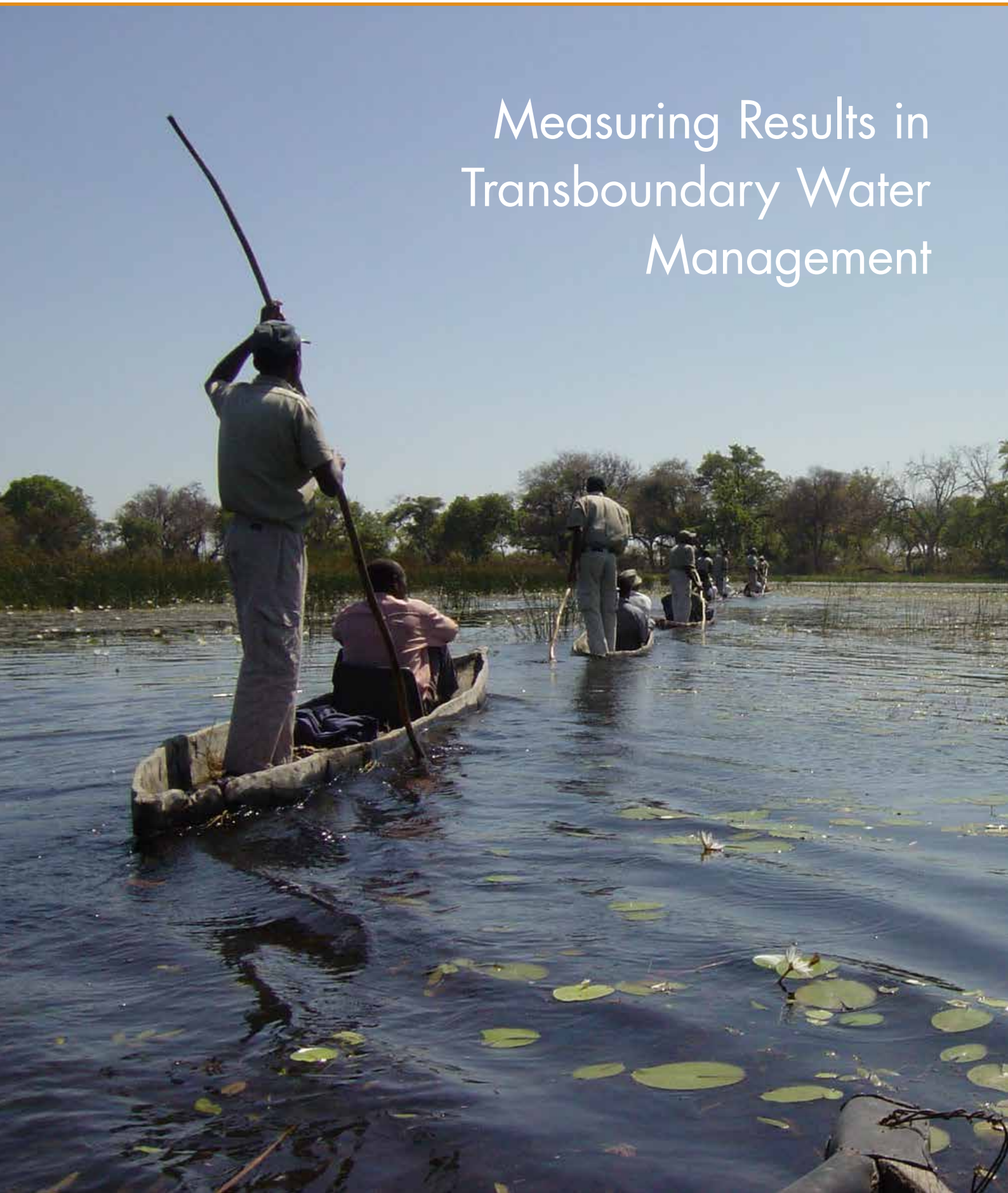
SIWI

SWEDISH WATER HOUSE

Background Report

Measuring Results in Transboundary Water Management



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Exectutive Summary

During 2013 the Swedish Water House and Stockholm International Water Institute (SIWI) commissioned a rapid assessment to compile experience on results and risks in transboundary water management (TWM). From a larger set of collected documents on international TWM projects, fourteen reports from various parts of the world were selected for the assessment.

The rapid assessment showed that reporting on TWM tends to cover activities and outputs. Typical outputs include study reports, decision-support systems, equipment, strategic plans and individuals trained. Outcomes relate to institutional arrangements, improved investment climate or resources mobilised, and in some cases improvements in hydrological or environmental conditions. Only a few of the TWM projects led to substantial actual investments, but in some cases there is anecdotal evidence demonstrating impacts on ecological status and livelihoods. While there is reason to believe TWM can contribute to regional integration, peace and stability, these effects have generally not been measured. Transboundary water projects are associated with high risks and uncertainty, often facing challenges of poor ownership and sustainability, and risk management commonly appears to be insufficient.

The results observed were assessed against the emerging results framework of one of the larger TWM donors, Sida. While the framework indicators will be useful, they need to be adjusted to reflect transboundary conditions. Furthermore, some of the results observed in TWM will probably better fit into other results areas, rather than in water resources management.

This report ends with some recommendations which aim at improving results-orientation, measurability and risk management. They also seek to alert donors to the fact that TWM is a broad and complex process which may contribute to many different types of results, not necessarily only within the traditional realm of water resources management.

List of Acronyms and Abbreviations

CEE	Collaboration for Environmental Evidence
CFA	Cooperative Framework Agreement
DAC	Development Assistance Committee
DFID	Department for International Development
DSS	Decision Support System
ESCWA	United Nations Economic and Social Commission for Western Asia
ICT	Information and Communications Technology
IWRM	Integrated Water Resources Management
LOA	Letter of Agreement
M&E	Monitoring and Evaluation
MENA	Middle East and North Africa
MFA	Ministry of Foreign Affairs
MOU	Memorandum of Understanding
NBTF	Nile Basin Trust Fund
NELSAP	Nile Equatorial Lakes Subsidiary Action Programme
OECD	The Organisation for Economic Co-operation and Development
SDC	Swiss Development Co-operation
Sida	Swedish International Development Cooperation Agency
SIWI	Stockholm International Water Institute
SWH	Swedish Water House
TWM	Transboundary Water Management
WRM	Water Resources Management
WWF	World Wide Fund for Nature

1 Background

Under the auspices of Stockholm International Water Institute (SIWI), the Swedish Water House (SWH) has since 2011 organised a Cluster Group on Transboundary Water Management (TWM). By gathering Swedish expertise from non-governmental organisations, public authorities, research institutes, universities and private companies, SWH wishes to increase the interest and engagement of riparian countries, development partners and civil society for transboundary water management by providing them with a deeper understanding of the development context and broader socio-economic framework in which it takes place. The aim is to identify fact-finding and research on how and in what areas the results of transboundary water management projects can be measured in terms of their effect on development, including aspects such as the environment, poverty, economic development and political stability.

In late 2012, the group started work on developing policy recommendations for TWM which could feed into the advocacy and knowledge-sharing activities of SWH. Swedish actors are one important target group for SWH advocacy. In 2013, the Swedish Ministry of Foreign Affairs and Sida reviewed key strategic guidelines for international cooperation. around water. In addition, the operational management routines for Sida are being revised. Much more emphasis is being placed on the ability to measure results and to assess and manage risks in international co-operation, in line with global trends on increased results-orientation. In order to contribute positively to the Swedish Government's process of structuring development interventions around a new results framework, the Cluster Group decided to commission a rapid assessment, intended to:

- compile global experiences and lessons learnt on results and risks with TWM, based on completed and ongoing co-operation initiatives
- provide generic suggestions for how to formulate and measure results for TWM
- outline typical risks associated with TWM and suggestions on how to identify and manage the risks.

The rapid assessment was carried out by Dr David Nilsson of Hydropolis Consulting and Research AB in the period September-October 2013. A workshop was organised by SIWI on October 3 to discuss the preliminary findings of the assessment. This document reports on the main findings and recommendations of the rapid assessment and the workshop.

2 Methodology

The assessment was carried out in two steps: i) document collection and ii) analytical desk study.

2.1 Background data

Through the SWH Cluster Group and its worldwide partner networks, SIWI collected background documents (available reports) from TWM projects across the globe. In its call for documents, SIWI primarily asked for results-oriented reports from transboundary basins in Africa, Asia and the Middle East and North Africa region (MENA), such as completion reports, mid-term reviews and evaluations. A total of 66 background documents were received, ranging from completion reports and evaluations to theoretical papers, method notes and journal articles. The documents collected were of the following regional distribution:

- Asia: 18
- Africa: 20
- MENA: 7
- S. America: 1
- Global: 20

In consultation with SIWI, the consultant selected 14 documents for a desk study analysis (see table 1). In order to analyse actually reported results and risks, and not only expected effects or risks, priority was given to empirically robust and results-oriented reports such as completion reports, mid-term reviews and evaluations. Seven reports pertained to Africa south of the Sahara and three reports to Asia. Only two documents were selected for the MENA region but one of them dealt with several shared water basins. In addition, two documents discussing results and risks at global level were used as reference documents. Most of the documents relate to specific projects and contain specific results-related information. However, a few reports are more generic or summative, such as the compilation of case studies on Western Asia shared waters. The authors and sources are different and the reports have been written over a period of almost ten years, during which time there have been some shifts in what is considered good practice in results management. Hence, it is important to bear in mind that type, style and methodology are not identical in the reports.

Table 1. Documents selected for the analysis

NAME OF REPORT	COMMISSIONING ENTITY	GEOGRAPHIC AREA	TYPE	YEAR
Lake Chad Basin Commission, Land and Water degradation	World Bank	Central Africa	Completion report	2009
Songwe River Transboundary Catchment Management Project (Tanzania-Malawi)	SDC and WWF	East Africa	Evaluation	2010
Mara River Basin Management Initiative, Kenya and Tanzania	WWF	East Africa	Evaluation	2013
End of project evaluation of NELSAP RBM (Mara/ Sio/Kagera)	NBI/NELSAP	Southern Africa	Evaluation	2013
Environmental Protection and sustainable management of the Okavango basin	GEF	Southern Africa	Evaluation	2010
Independent Evaluation of the NBTF	World Bank / SIWI	Africa	Evaluation	2013
Senegal River Basin	World Bank	West Africa	Completion report	2009
Aral Sea Water and Environmental Management Project	World Bank	Asia	Completion report	2004
Mekong Water utilisation project	World Bank	Southern Asia	Completion report	2009
Reaching Across the Waters: Facing the Risks of Cooperation in International Waters	World Bank	Global	Overview, method paper	2012
Scarcity and conflict – evidence analysis	CEE / DFID	Global	Scientific paper	2011
Transboundary benefit sharing	MFA	Global/Asia	Case study Mekong	2006
Inventory of shared water resources in Western Asia	UN-ESCWA	MENA	Overview report	2013
Red Sea Action programme	World Bank	MENA	Completion report	2005

2.2 Analytical method

The results reported in each of the 12 reports from Africa, Asia and the MENA region were extracted into a spreadsheet database. To define what would constitute a "result", the OECD/DAC definition was used. See table 2 below.

However, as none of the reports followed a uniform mode of reporting, nor a congruent results terminology, the analytical process to a certain extent depended on interpretation and common sense. For example, what was reported as an "Output" in one report may well have been regarded as an activity in another, while other Outputs preferably should have been classified as "Outcomes" according the DAC Glossary. Furthermore, duplicated results were not repeated, i.e, where the same types of result were reported in several instances, only one entry was made in the spreadsheet (as the purpose was not to make a quantitative assessment but to map the characteristics of TWM results).

One important limitation in the methodology should be noted. It has not been possible to make any in-depth assessment either of the method used, or of the empirical robustness of each document studied. While this rapid assessment has tried to deal cautiously with results statements that are of a vague and sweeping nature, or purely of an anecdotal type, it has been necessary to use the results presented "at face value" without being able to further validate them.

The list of identified results was condensed into a typology of results which is presented below, in the section on Findings.

With regards to Risks, a similar approach has been used. Finding a common definition of risk in the reports was difficult. For the purpose of this rapid assessment, any factor or circumstance, whether internal or external, reported to have had a substantial negative effect on the project achieving its short- or long-term objectives, has been regarded as a risk. These risks were compiled into a gross-list of reported risks, which were then further condensed into a shorter list of Typical Risks. To be classified as "Typical", a risk should have occurred in at least three different reports, in identical or similar descriptions.

Table 2. Definitions from OECD/DAC Glossary (2002)

RESULTS	The output, outcome or impact (intended or unintended, positive and/or negative) of a development intervention.
OUTPUTS	The products, capital goods and services which result from a development intervention; may also include changes resulting from the intervention which are relevant to the achievement of outcomes.
OUTCOME	The likely or achieved short-term and medium-term effects of an intervention's outputs.
IMPACT	Positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended.

3 Findings

The findings of this rapid assessment fall into three major categories. Firstly, what kind of results (output, outcome, impact) can be discerned from TWM cooperation (a typology of results)? Secondly, what risks are typically associated with TWM? And thirdly, to what extent are the results observed commensurate with the emerging results framework of Sida?

3.1 Results

In going through the reports, it was obvious that there was a fairly common tendency to report on activities. From the operational and financial side of a TWM project, activities are essentially at the core and understandably attract most of the operational focus. However, from a results-oriented reporting point of view, activities are of less interest as they cannot be regarded as Results e.g. in the terminology of OECD/DAC. One of the Evaluation Reports pointed out that: "The reported achievement comprises many meetings, workshops, agreements and consultancies which are not results."[1] Nevertheless, many of the activities deliver some kind of output, such as a plan or a signed protocol, which can be reported as results. In this Rapid Assessment, results from the reports studied, which may be classified as Outputs, Outcomes or Impacts have been included in the typology below.

[1] Tortell and Chapeyama 2010, page 47.

TWM RESULTS TYPOLOGY		
REPORTED OUTPUTS (short-term)	**REPORTED OUTCOMES** (medium-term)	**REPORTED IMPACTS** (long-term)
• Offices, vehicles, ICT • Hydromet/WQ equipment • DSS, models, databases, GIS • Study reports and maps • Communication materials • Manuals, guidelines • Strategic plans • Infrastructure • Landscaping • Individuals trained • Organisations formed • Institutional instruments	**Improved efficency and quality in:** • TWM Institutions • Communication • Awareness and capacity building • Cooperation **Improved safety in:** • Dams • Navigation • Peace and stability **Mobilised:** • Resources	**Reduced:** • Water borne disease **Stabilised:** • Hydrological regime **Increase in:** • Agricultural yield • Regional integration and trade • Income levels • Human Development Index **Improved:** • Ecological status

3.1.1 Outputs

Offices, vehicles, ICT
Many – if not all – TWM projects include setting up an organisational unit to co-ordinate the TWM activities in the basin, or strengthening existing organisations. Often this includes the procurement and handing over of assets necessary for the unit to perform its functions, such as offices, furniture, telecom equipment, computers, and vehicles.

Hydromet/WQ Equipment
Another common component in the TWM projects studied is to establish or improve systems for acquiring hydrological and meteorological data and in some cases also data on water quality. Many projects thus report on procurement and installation of this kind of equipment within the basin.

DSS, models, databases, GIS
Decision Support Systems (DSS) to evaluate different scenarios feature as outputs in several basins. Hydrological models, digital databases and Geographical Information Systems (GIS) are also common, often as part of a DSS. These outputs contain both software (programming) and hardware (ICT equipment).

Study reports and maps
A lot of studies, surveys, mapping etc are carried out in most TWM projects (as Activities), normally documented in reports and maps which are the actual outputs. Workshop proceedings can also belong to this group.

Communication material
Brochures, leaflets and other materials are produced for communication purposes, mainly to inform the public and stakeholders.

Manuals, Guidelines
In some projects manuals and guideline documents are produced so as to standardise practices in a variety of fields such as flood management, erosion protection, quality surveying etc, depending on the components and objectives of the project.

Strategic Plans
The future joint management and development activities of a basin area can be coded into a Strategic Plan, to steer co-ordinated action in the basin for a specific time period. This is a central output for most of the projects as a blueprint for development and management, and one that it is often hoped will outlive the project. The actual Strategic Plan (set of documents) as produced within the project lifespan is to be regarded as an Output. If the Plan is successful, it guides activities which may have intermediary and long-term effects (Outcomes and Impacts).

Infrastructure and Landscaping
In a couple of instances, the transboundary water cooperation has led to major investments. Negotiations between Syria and Jordan over a period of more than fifty years led to the completion of the Wahdah dam on the Yarmouk river (a tributary to the Jordan river), in 2009[2]. In the large transboundary project on saving the Aral Sea, a major restoration of wetlands was included in the project[3].

[2] UNESCWA and BGR 2013
[3] World Bank 2004

Many projects aim at paving the way for specific infrastructure investments in various ways, e.g. through institutional setting, increased trust, pre-feasibility studies and resource mobilisation. In the case of the Nile Basin Trust Fund, it was reported that the NBTF activities led to successful mobilisation of 700 MUSD and another 600 MUSD "in the pipeline" for regional infrastructure. None of this has however been completed.[4]

In some cases, more indirect links to infrastructure investments are made through so-called "spin-offeffects" from a TWM project, such as in the Nile Basin Initiative.[5] However, these investments should not be regarded as an "output" from the cooperation projects assessed, since outputs should be within the control of the project.

Several TWM projects also include smaller infrastructure investments during the project period. The reported small grants investments are diverse and include activities such as river bank protection, tree planting and dairy goat farming (Mara river), improved water supply (NELSAP/Sio-Malaba-Malakisi) and reforestation, land management, hydro-agricultura dam development and fish farming (Senegal river).[6]

Individuals trained

The documents analysed in this study all report on activities in capacity building. However, the manner in which results from these activities are reported differs. While some mainly describe the activities executed (workshops and courses held, on-the-job training etc) others report on number of staff or community members trained. None of them, however, makes any serious attempt to measure and report on the increased capacity itself (e.g. performance indicators) other than through self-assessments.

Organisations formed

Another type of output closely linked to capacity building is the formation or re-organisation of specific organisational units that may perform certain functions, such as regional reference groups, basin co-ordination units, technical working groups etc. These outputs are of an "intangible" nature, in contrast to the much more tangible outputs of, for example, hydromet equipment, manuals or fish ponds.

Institutional instruments (protocol, MoU, LoA, procedures, CFAs)

All TWM projects aim to increase and improve co-operation and the rules and conditions for such transboundary co-operation between states and state organs are typically coded into various types of institutional instruments. Some of them may take the form of a legally binding agreement like an international Protocol, which may be further strengthened by ratification and integration into national legislation (e.g. the Mekong agreement). There are also many less formalised types of instruments, such as Memoranda of Understanding or by-laws at local or sub-regional level (Songwe), agreed procedures for data exchange (NBTF) etc. While many TWM projects report on such institutional instruments as Outputs, their enforcement and long-term effectiveness (i.e. approaching Outcome level) is much more difficult to assess.

3.1.2 Outcomes

Institutions for TWM in place and effective

While several of the documents report on the agreements on and production of various kind of institutional instruments (Protocols, MoUs, CFAs, etc), there is seldom an assessment of how effective these instruments are. To be classified as an Outcome, they should have a lasting effect on development in the basin. However, at least in a couple of instances, TWM institutions were reported to be enforced and to have a lasting effect, e.g. in the Mekong, the Aral Sea, the Senegal river and the Songwe basin.

Safety improved

Two of the projects specifically report on improved safety as a result of the interventions. One concerns improved dam safety (Aral Sea) and one reports on improved safety of navigation (Red Sea).[7]

Quality of cooperation improved

There are many statements in the TWM reports that relate to the quality of co-operation. Statements like "Coordination and cooperation ongoing", "Trust has been built and tensions are reduced", "Improved enabling environment", "there is a spirit of co-operation", "Perception of risk has decreased", or "shift on geo-political thought" abound throughout the reports.

One indicator on quality of cooperation readily available is to what extent the riparian governments contribute financially to the regional processes. Unfortunately, this indicator has not been commonly used in combination with the more generic statements above, with one notable exception. In the completion report on the cooperation around the Red Sea, "the commitment of countries in paying their dues" was used to demonstrate the quality and value added of the regional co-operation.[8]

Peace and Stability

Implicitly, there are connections between improvements in quality of cooperation and peace and stability. In the co-operation around the Nile, the contribution to peace and stability is specifically stated in the results chain of the NBTF. The evaluation found that "NBI's contributions to peaceful resolutions of conflict in the Nile Basin have clearly contributed to stability […]".[9] While these are desirable improvements, the projects – including the NBTF – often seem to lack a practical

[4] To what extents investment and investment preparation should be regarded as Outcomes, Outputs, Activities or Inputs is further discussed below.

[5] Earle et al 2013.

[6] Onyando, Agol and Onyango 2013; Claassen 2013; World Bank 2009.

[7] World Bank 2004; 2005.

[8] World Bank 2005.

[9] Earle et al (2013), p 67.

way of measuring the quality of the co-operation and in what way projects have actually "contributed to stability". There is a growing body of literature on the relationship between water scarcity, transboundary cooperation and conflict. According to an evidence-based review carried out by the Collaboration for Environmental Evidence in the UK in 2011, this scientific area is still in a formative stage. Based on 18 transboundary water studies, the review concluded that the scientific evidence is still lacking for any clear correlation between transboundary waters, scarcity, cooperation and conflict.[10] Nevertheless, the review also concluded that:

"The huge economic and social costs of violent conflict mean a systematic and coordinated research programme in this field would be worth the investment."[11]

Increased communication
Established forms for sharing of information, for communication and the formation of formal and informal professional networks are Outcomes reported in several projects. The effectiveness of these are however difficult to measure in other ways than through regular activity reporting.

Awareness and Capacity
A large group of Outcomes pertain to capacity and awareness. For example, on the Okavango basin it was reported that the interventions led to "significant impacts on the capacities of institutions and individuals".[12] In the NELSAP projects the "institutional and individual capacity developed" and "Increased awareness among communities" were stated as Outcomes.[13] Under this category the adoption of new practices and "improved understanding of basin attributes" could be mentioned.[14]

The reported outcomes relating to awareness and capacity are typically stated in general terms and are seldom related to specific achievements or measurable performance improvements, such as reduced time delays, professionalism in operations, adherence to routines and standards etc. While such information may be possible to extract from project monitoring reports, audit reports or organisational assessments, they are largely absent in the overall results reporting.

Resources mobilised
Some TWM projects, e.g. the NBTF and the three NELSAP river basin projects, report on resources mobilised for "downstream investment" as an Outcome. The definition of "Outcome" as "The likely or achieved short-term and medium-term effects of an intervention's outputs" does not easily lend itself to the inclusion of "resources mobilised" as an Outcome. The resources mobilised will form the input for a secondary development intervention, and should not be regarded as an "effect" on the project environment. The effect on the project environment of the activities and outputs within the primary development intervention would instead be the enabling conditions for investment, such as reduction of risk, increased level of investor confidence, legal framework etc. It would be more logical and stringent to regard these "investment enablers" as the short-term effect tthat constitute the Outcomes.

3.1.3 Impacts

The reports under study often lack any demonstration of long-term impacts. This is understandable given the long time scale envisaged for any development intervention to reach fruition in terms of a larger development effect. Also, the attribution of long-term impact to a specific intervention is not straightforward.[15] Nevertheless, some TWM projects actually report on observed impacts, although most of them are presented in an anecdotal form:

Water-borne disease (NELSAP):
"NELSAP prepared and implemented the Bomet water supply project, and this has in part contributed towards a reduction in water-borne diseases."[16]

Impact on hydrological regime (Songwe river):
"Communities in the districts of Chitipa and Ileje reported that the incidence of wildfires in their forest areas had significantly decreased after the introduction of the land-use planning processes and the development of the Land Use Plans. The application of these tools is reported to have some positive results. Community Institutional structures interviewed in Karonga and Kyela,reported less frequent flooding and deeper, stronger, more sustained flows of rivers over each season now that the various soil and water management technologies have been introduced."[17]

Agricultural yield (Songwe river):
"In general the farmers report that through these measures their maize crops have increased from 1 or 2 bags (±70 kgs per bag) to around 8 to 9 bags per acre, with some even reporting harvesting 12 bags per acre!"[18]

Human Development and Regional integration (NBTF):
In the NBTF evaluation report it is argued that the improvements of the Human Development Index and regional integration (trade etc.) seen in the basin area have been supported and facilitated by the Nile Basin Initiative, although a direct attribution is not possible.[19]

[10] Johnson et al (2011), p 50.
[11] ibid, p 7.
[12] Tortell and Chapeyama 2010.
[13] Claassen 2013.
[14] Tortell and Chapeyama 2010
[15] see discussion e.g. in Sida (2013), Guiding Framework for the Use of Indicators at Sida.
[16] Claassen, p 14.
[17] Matiza and Johnson 2010, p 16.
[18] ibid, p 31.
[19] Earle et al 2013, p 86-88.

Income levels (Lake Chad and Aral Sea):
The World Bank states in its reports that the interventions had impacts including "restoration of income of local stakeholders in specific micro-grant areas"[20] and "economic benefits gained as the local population use restored area for fishing, hunting and grazing."[21]

Ecological status
While most of the statements on impacts are more of an anecdotal type, there is one exception. In the project on the Aral Sea, the World Bank reports on the measured improvement of ecological status in terms of improved salinity and oxygen levels in the Sudoche wetlands, (measured at 10 g/litre ; 6 mg/l respectively), along with the restored bird life of the wetlands.[22]

3.2 Risks

Carrying out a transboundary water management initiative is associated with many risks and uncertainties. Some of these risks have been identified and managed through risk management strategies in project implementation, with varied success. This section presents the kind of critical challenges that have negatively affected project implementation.

Interestingly, some risks appear to be more common than others, and are repeatedly found in the documents studied. Most of the TWM projects studied have been exposed to the following risks:
- Lack of ownership by riparian countries
- Lack of financial and institutional sustainability
- Insufficient capacity (regional and national) to effectively perform TWM

In at least three of the TWM projects studied, these risks are mentioned:
- National interests dominate over common interests
- Poor co-ordination and performance of donors
- Overambitious goals and expectations with the TWM projects
- Low quality of project appraisal, management and M&E
- Insecurity and regional conflicts
- Other external risks (e.g. avian flu, climate change)

Other risks that were mentioned in connection with at least two basins were:
- Slow or insufficient resource mobilisation jeopardising trust and momentum
- Over-reliance on international consultants undermining regional capacity building

In general, risk management in TWM appears to be a neglected area considering the complex and geopolitically sensitive context in which these co-operation initiatives are taking place. In an in-depth study of perceived risks and cooperation dynamics in five international basins, the World Bank concluded that the need to understand and mitigate risks is commonly underestimated. The same study also noted that risks are complex and require a diverse set of mitigation approaches. In virtually all of the TWM reports studied here, critical risk factors have influenced the outcomes. In at least one of the projects studied in this rapid assessment (Okavango), the evaluation concluded that risks had not been adequately identified in the preparation as well as implementation stage.

3.3 Comparison with Sida's draft Results Framework

During 2013, Sida has been developing a new agency-level framework for monitoring and managing the results of all of Sweden's government-funded development co-operation. The purpose is to improve and facilitate a results orientation of Sida's interventions. The emerging framework will apply to all results areas, and it is expected have four results levels: impact, outcome, output plus one level relating to the internal Sida process. For each result area there will be a set of indicators at all four levels. See box 1 below.

Furthermore, every indicator is supposed to belong to any of the following categories:
- Effects on target groups
- Political will
- Capacity development

A draft set of indicators for the results area "Water Resources Management" has been made available by Sida for the purpose of the rapid assessment. The internal process-related level will not be applicable for this assessment. However, for each of the other three levels, brief comparisons of the proposed water resource management (WRM) indicators against the observed results in the sample documents are provided below. The proposed indicators will not be assessed per se, in terms of general feasibility or relevance. Instead, focus is given to the extent they may be useful for TWM cooperation, considering the results observed above.

3.3.1 Output indicators

One of the proposed output indicators relates directly to what many TWM initiatives have as a core objective:
- River basin organisation established

Obviously, the indicator on river basin organisations can be directly applicable for TWM. However, while this can be an

[20] World Bank 2009, p 14.
[21] World Bank 2004, p 10-11
[23] Subramanian, Wolf and Brown 2012, p 6-7.
[24] Tortell and Chapeyama 2010, p.9.
[25] Sida, PM dated 8 Feb 2013, "Uppdragsbeskrivning: Indikatorer i biståndet".

Box 1. Structure of indicators for Sida results framework (from Sida 2013, Guiding Framework for the Use of Indicators at Sida)	
1. DEVELOPMENT INDICATORS (IMPACT)	
Definition	An indicator at the macro level measuring changes at an overall level of society. Examples are GDP/Capita, unemployment rate, governance indexes, air/water quality, MDG indicators etc.
2. OUTCOME INDICATORS	
Definition	Outcome indicators at an intermediate level of society are those that, to a varying extent, create pre-conditions for trends (results) at the macro level. For example, the business environment, reflected in indicators such as doing business ranking, might be expected to contribute (to some extent) to economic growth and/or employment. The level of freedom of information, free and fair election systems etc, are expected to contribute to good governance, and so on.
3. OUTPUT INDICATORS	
Definition	Output indicators measure the direct results, in terms of products and services delivered. How these are formulated varies somewhat according to the forms (project, programme, budget support etc) and channel s (bilateral, multilateral etc). They measure results to which Swedish support has contributed in a direct manner. These results in turn contribute to results at the intermediate/outcome level. Examples of output indicators may be for example the number of micro credits distributed, number of staff educated, etc.
4. CONTRIBUTION PROCESS INDICATORS	
Definition	Indicators that measure the efficiency of Sida's internal processes. They may include for example number of contributions with a guarantee instrument, private companies co-financing, number of Environmental Impact Assessments.

important output, the proposed indicator says nothing about the effectiveness of the organisation, i.e. what the effect at Outcome level will be.

Another indicator relevant for TWM is:
- Number of meetings of government agencies with water interests to consult and collaborate on water management

This is an indicator under the category "Political will", which relates to ownership issues and quality of cooperation. However, it would need to be adjusted to include the international level, e.g. government-to-government meetings.

The remaining indicators may be of relevance to TWM, depending on how far relevant components are included in the cooperation:
- Wastewater discharge from a utility that complies with quality standards (share of days in a year with full compliance)
- Number of surface and groundwater users licensed according to regulations
- Number of forecasts or warnings issued for low/high river flows
- Quality of forecasts or warnings issued for low/high river flows

A general observation is that Sida's proposed output indicators are at a more aggregated level than those described in the TWM documents studied. Most outputs reported on in the TWM documents would be too detailed and too project-related (e.g. equipment, DSS installed, individuals trained, strategic plan agreed etc.) to leave any mark in the Sida WRM framework.

3.3.2 Outcome indicators

Proposed indicators that measure the level of political will and ownership will be of relevance for TWM cooperation:
- Water is mainstreamed into national development policies, strategies and plans
- Water sector share in total public spending
- National plan or strategy (e.g. IWRM, Water Efficiency, Integrated coastal zone management) developed and adopted

These indicators would need to be slightly adjusted to better reflect the transboundary context, e.g. by looking at the mainstreaming of transboundary water issues into national legislation, and the adoption of basin-wide plans or strategies.

Direct effects from TWM on ecological status could also be measured by applying the following indicators in the Sida framework:

- % of surface water quality samples complying with water quality objectives
- On stream fishery freshwater fish catch

Direct effects at outcome level on gender and governance aspects will also be readily measurable through the following indicators:

- Women are actively influencing decision-making through water resources management committees
- Representation of at least 50% women in water decision-making bodies at all levels.
- Water management information is available to managers and other stakeholders as required
- Access to information, participation and justice

Finally, there are two more indicators in the Sida framework:

- Use by abstraction by main sector (agriculture, industry or domestic)
- Quantity of water used per capita per day (Urban/Rural)

The usefulness of the two latter in a TWM context is more difficult to assess, as they may be difficult to directly link to transboundary cooperation in the short to medium term. Nevertheless, they may be useful as background indicators or contextual factors.

In conclusion, the Outcome indicators proposed in the Sida framework will be useful after a slight adjustment to better reflect the transboundary context. However, many of the outcomes observed in the TWM reports will not be properly captured and reflected in the proposed framework, such as:

- Institutions for TWM in place and effective
- Safety improved
- Capacity for TWM built
- Quality of cooperation improved
- Resources mobilised

3.3.3 Impact indicators

At the impact level, the Sida framework proposes the following indicators:

- Total actual renewable water resources per person
- Proportion of total water resources used
- Annual freshwater withdrawal
- Water scarcity index/water stress index
- Assessing progress towards achieving the integrated water resources management (IWRM) target
- Quality of available renewable water resources

The first four indicators are quantitative and aim to aggregate freshwater use per capita, or per economic activity. Some of these indicators may be useful at transboundary level in instances where major components are included that may affect overall water use (e.g. irrigation). The last two indicators may also be useful, particularly in measuring the long-term effect on water quality of IWRM activities in a shared basin.

However, it is obvious that the impacts (expected or observed) from TWM on socio-economic levels, regional integration, peace and stability are not reflected in the WRM results framework proposed. Possibly, these long-term results may be measured through indicators in other sectors or results areas, such as peace and conflict and economic development.

4 Conclusions and Recommendations

Conclusions

1. Reporting on TWM is to a large extent oriented towards activities carried out (e.g. workshops, training courses, participatory processes, high-level meetings). However, activities are not results as such, but should produce results if properly carried out.
2. Of the actual results reported, the Outputs clearly dominate. Typically, TWM projects will produce outputs such as monographs and study reports, Decision-support Systems, hydro-meteorological equipment, Strategic Action Plans, and small-scale infrastructure.
3. Capacity building is a major results sub-area of TWM. Results reported here include courses held, staff trained, assessments made, etc. Important to note is that increased capacity resulting from such activities is seldom measured and reported on.
4. Monitoring and Evaluation is generally weak, often with inadequate indicators, insufficient monitoring and inconsistent frameworks.
5. A few TWM projects have been successful in resource mobilisation but whether these have led to implementation of major infrastructure works or not has not possible to assess. There is also ambiguity regarding under what conditions "resources mobilised" should qualify as a result.
6. Institutional outcomes such as procedures, protocols, MOUs, CFA and conventions are important results in TWM. Their effectiveness (national mainstreaming, compliance, enforcement) is however difficult to monitor and assess.
7. Some development impacts have been reported regarding environmental and socio-economic effects attributable to specific TWM projects, notably in the Aral Sea, Mara

river, Senegal river and Lake Chad. One problem is that the reporting is mainly anecdotal and often lacks a clear evidence base.

8. The long-term effects on investment climate, peace-building and regional integration in some reports can be reasonably justified, but remain difficult to measure.
9. The emerging Sida results framework for Water Resource Management will be applicable to TWM after minor adjustments. It is obvious, however, that several of the medium to long-term effects from TWM such as economic development, capacity built, investment climate, stability and integration, will not be captured by Sida's proposed indicators for WRM results area. Furthermore, Sida's WRM results framework is focusing on a more aggregated level of effects than those generally found in the TWM project reports.
10. TWM is a complex, high-risk area of cooperation and some risk factors seem to be particularly endemic. These include: lack of ownership by riparian governments; low institutional and financial sustainability; and lack of capacity.

Recommendations

1. Be realistic. TWM is risky and complex, capacity is generally lacking and sustainability cannot be guaranteed. Therefore, a realistic approach must be employed in the planning of a TWM intervention.
2. Take Risk Management seriously. Make sure to conduct an initial risk assessment for projects, and assign clear responsibilities for managing the risks during project implementation. Adequate risk management entails careful management considerations, a variety of mitigation interventions and that necessary time and resources are allocated during implementation.
3. Contextualise endemic risk factors. Some risks appear to be almost endemic to TWM: lack of ownership, poor sustainability and insufficient capacity. Find out how these critical factors play out in the specific situation when planning an intervention, and how basin dynamics influence these risks.
4. Develop a clear "result chain" all the way to Impact. The medium to long-term effects may not be possible to measure and report at completion. The results chain of an intervention must therefore be feasible and realistic, clearly demonstrating how short-term results (outputs) are expected to lead to long-term effects, and include the assumptions made.
5. Don't wait for downstream investments. When preparation and resource mobilisation for downstream investments" are part of the objectives, define intermediary results that are within the control of the project and may be reported on as Outcomes at completion. Indicators such as investor confidence, risk perception, clarified legal framework etc., can be measured using adequate methodologies.
6. Measure capacity, not workshops. Establish indicators that measure capacity improvement, e.g. through performance assessment, surveys and self-assessments, procurement delays etc., rather than just reporting capacity-building activities or head-counts of course attendance.
7. Find alternative indicators for the soft results. TWM processes are assumed to contribute to capacity development, peace, stability and regional integration but much more work is needed to define results and indicators. Perceptions and attitude surveys, as well as indicators on trade, professional migration and technical exchange may be useful. Experience with indicators from other sectors needs to be looked into.
8. Get baselines in place first. Establish baselines during project preparation to relate any changes/achievements to during and after project execution. A proper preparation of baseline data will also enable better understanding of the challenges of Monitoring and Evaluation during the project.
9. Capture TWM results in many areas. Transboundary co-operation is multi-faceted and contributes to development through a broad range of mechanisms in different result areas or sectors. Indicator frameworks must therefore be flexible enough to capture results in many results areas, and should not be confined to the traditional water sector issues.

References

Claassen, M. (2013). End of project evaluation for the Transboundary Integrated Water Resources Management and Development projects in the Mara, Sio-Malaba-Malakisi and Kagera, NELSAP, Nile Basin Initiative.

Earle A. et al (2013). Independent Evaluation of the Nile Basin Trust Fund (NBTF), SIWI, Stockholm.

Johnson, V., Fitzpatrick, I., Floyd, R. and Simms, A. (2011). What is the evidence that scarcity and shocks in freshwater resources cause conflict instead of promoting collaboration? CEE review 10-010. Collaboration for Environmental Evidence: www.environmentalevidence.org/ SR10010.html.

Matiza Chiuta T. and Johnson S. (2010). Songwe River Transboundary Catchment Management Project, Final Evaluation Report, SDC /WWF.

Phillips D., Daoudy M., McCaffrey S., Öjendal S. and Turton A. (2006). Trans-boundary Water Cooperation as a Tool for Conflict Prevention and for Broader Benefit-sharing, Ministry for Foreign Affairs, Sweden, Stockholm.

Subramanian A., Brown B., and Wolf A. (2012). Reaching Across the Waters. Facing the Risks of Cooperation in International Waters, World Bank, Washington D.C.

Tortell P., and Chapeyama O. (2010). Terminal evaluation of the Environmental Protection and sustainable management of the Okavango basin, GEF.

UN-ESCWA and BGR (2013). Inventory of Shared Water Resources in Western Asia. United Nations Economic and Social Commission for Western Asia; Bundesanstalt für Geowissenschaften und Rohstoffe, Beirut.

World Bank (2004). Completion Report, Executive committte of the international fund for saving the Aral Sea. World Bank, Europe and Central Asia region.
World Bank (2005), Regional project for the implementation of the strategic action plan for the Red Sea and Gulf of Aden.

World Bank (2009). Draft Completion Report, Lake Chad Basin Commission, Land and Water degradation.

World Bank (2009). Completion Report, Senegal river basin. World Bank Africa Region.

World Bank (2009). Completion report on Mekong River Commission, Water utilisation project. World Bank, East Asia and Pacific Region.

Onyando J., Agol D. and Onyango L. (2013). WWF Mara River Basin Management Initiative, Final evaluation report, World Wide Fund for Nature, Nairobi.