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Governments of Chad, Egypt, Libya and Sudan

Global Environment Facility

International Atomic Energy Association

United Nations Development Programme

Additional partners:

UNESCO

Terminal Evaluation of the UNDP/GEF Project "Formulation of an Action Programme for the Integrated Management of the Shared Nubian Aquifer"

GEF Project ID no. 1528

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Prepared by Lubomyr Markevych

CONTENTS

Abbreviations and Acronyms

CEDARE	Center for Environment and Development for the Arab Region and Europe
COB	Convention on Biological Diversity
FAO	Food and Agriculture Organization of the United Nations
GEF	Global Environment Facility
IAEA	International Atomic Energy Agency
IBWC	International Boundary Waters Commission
IFAD	International Fund for Agricultural Development
ISARM	Internationally Shared (Transboundary) Aquifer Resources Management
MSP	Medium-Sized Project
NARIS	Nubian Sandstone Aquifer Regional Information System
NEPAD	New Partnership for Africa's Development
NSAS	Nubian Sandstone Aquifer System
OSS	Sahara and Sahel Obeservatory
SADA	Shared Aquifer Diagnostic Analysis
SAP	Strategic Action Programme
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization

Executive Summary

Introduction

This is the Terminal Evaluation of the UNDP/GEF Project "Formulation of an Action Programme for the Integrated Management of the Shared Nubian Aquifer". The Project offered the NSAS countries the opportunity to work collectively in managing not only the shared aquifer, but also in managing it in consideration of groundwater dependent ecosystems which without cooperative management might otherwise be degraded.

The Long-term Goal of this MSP is to establish a rational and equitable management of the NSAS for sustainable socio-economic development and the protection of biodiversity and land resources. To achieve this goal, the Immediate Objectives of this MSP project as set out in the Project Document are as follows:

1. Prepare and agree on a Shared Aquifer Diagnostic Analysis (SADA) to jointly identify, understand and reach agreement on the priority issues, threats and root causes of the NSAS;
2. Address and fill key methodological, data and capacity gaps needed for strategic planning decisions, using appropriate technical approaches with a focus on isotope techniques and applications under the supervision of the International Atomic Energy Agency (IAEA);
3. Undertake the preparation of a Strategic Action Programme (SAP) to outline the necessary legal, policy and institutional reforms needed to address the priority threats and their root causes as identified in the SADA for the NSAS with a focus on the environmental aspects of aquifer management;
4. Establish a framework for developing an agreed legal and institutional mechanism towards a NSAS convention for joint four-partite management and rational use of the shared NSA System.

The Project was supported by several institutional and national funding sources. Chief among these was the IAEA which had implemented national technical cooperation projects related to water resources management in the region for many years. Based on this past and on-going cooperation, the IAEA had already established a good basis of cooperation with many of the key stakeholders in the NSAS countries. The Project was also supported by UNDP with its substantial experience in delivering GEF IW projects. Financial and in-kind contributions from UNESCO and national funding from the NSAS states; Chad, Egypt Sudan and Libya were intended to match and exceed the GEF funding for this Project.

The Terminal Evaluation is intended to provide a comprehensive overall assessment of the project and serves as an opportunity to critically assess administrative and technical strategies, issues and constraints. It is also intended to promote accountability for achievement of GEF objectives. The evaluation follows GEF guidelines for assessing IW projects including a Rating of Progress for the results according to their relevance, effectiveness and efficiency; the likelihood of sustainability; and the Project's monitoring and evaluation system. It also analyses the factors and processes that affected the attainment of project results and sets out important

lessons learned and recommendations applicable to the IAEA, the NSAS states and GEF's larger portfolio of projects.

This evaluation was facilitated by the many participants who worked hard to implement the various activities and achieve the initial results that it has. Where applicable and deserving the evaluation offers due recognition for results successfully attained, together with constructive commentary where improvement is warranted and deemed relevant for possible future interventions.

The evaluation involved four phases of work – planning, information collection and review, key interviews/questionnaires and report writing. The evaluation was conducted by a single independent evaluator and followed the standard UNDP/GEF guidelines stipulated for this activity and which commenced near the conclusion of the project cycle. In particular the Evaluator benefited from the opportunity to attend the Final regional meeting of the Nubian (SAP) technical team which took place in Vienna on July 25-26, 2011. Unfortunately the Evaluator was unable to attend a successor meeting held in Vienna in November of 2011 however was able to benefit from the feedback to the initial draft Evaluation report which had been submitted at that time.

Additional options were considered including the possibility of making field visits to the region. These would normally be expected under GEF guidelines had the project been required to conduct pilot/demonstration activities as part of its outputs, which it was not. In addition the background instability in the region stemming from the 'Arab Spring' and the administrative difficulties of obtaining visas to the countries in the region made such visits impractical from the standpoint of additional investment of time and resources. The visa difficulties were further complicated by the fact that the Evaluator is a Canadian citizen residing in Ukraine which does not have diplomatic representation with most of the NSAS countries participating in the project.

Main Achievements

The Pro Doc describes the Overall Objective of the Project as the "*Rational and Equitable Management of the NSAS Towards Sustainable Socio-economic Development and the Protection of Biodiversity and Land Resources".*

This became the departure point for defining the four Immediate Objectives which in their expanded form read as follows:

i. Prepare and agree on a Shared Aquifer Diagnostic Analysis (SADA) to jointly identify, understand and reach agreement on the priority issues, threats and root causes of the NSAS;

ii. Address and fill key methodological, data and capacity gaps needed for strategic planning decisions, using appropriate technical approaches with a focus on isotopic techniques and applications under the supervision of the International Atomic Energy Agency (IAEA);

iii. Undertake the preparation of a Strategic Action Programme (SAP) to outline the necessary legal, policy and institutional reforms needed to address the priority threats and their root

causes as identified in the SADA for the NSAS with a focus on the environmental aspects of aquifer management;

iv. Establish a framework for developing an agreed legal and institutional mechanism towards a NSAS convention for joint four-partite management and rational use of the shared NSAS System.

Efforts to achieve the four objectives under this MSP were to involve the implementation of activities under five Components of which the first three are summarized here as follows:

Component 1: Preparation of Shared Aquifer Diagnostic Analysis (SADA) and Addressing Gaps in Capacity and Data

This component was to essentially try to achieve objective 1, which is to *prepare and agree on a Shared Aquifer Diagnostic Analysis (SADA) to jointly identify, understand and reach agreement on the priority issues, threats and root causes of the NSAS* through the preparation of the SADA and objective 2, *Address and begin filling key methodological, data and capacity gaps needed for strategic planning decisions, using appropriate technical approaches with a focus on isotopic techniques and applications under the supervision of the International Atomic Energy Agency (IAEA) through addressing gaps in capacity and data*.

The objective of the modelling effort was to produce a regional model of the aquifer which would have the capability to predict the extent of drawdown, or decrease in aquifer level, due to abstraction. This objective was designed to meet the needs of the SADA component of this project by anticipating the transboundary effects of abstraction under a variety of future development scenarios.

Perhaps the single greatest benefit realized by the SADA was the recognition that the immediate, direct transboundary threat of water-level declines due to cross border extraction are lower than originally thought. This has inspired a variety of related benefits including the recognition that water management strategies can be directed toward preventing rather than mitigating both transboundary and national water management problems.

The satisfactory completion of the SADA was universally acknowledged by all relevant officials interviewed in the project. Moreover the SADA findings served as an excellent platform for the next stage in the project being the development of the Strategic Action Programme (SAP).

The successful completion of Component #1 and attainment of *Project Objective #1 and #2* is rated as ***Satisfactory*****.**

Component 2: Preparation of a Strategic Action Programme (SAP)

This component was to achieve Objective 3, which is to *undertake the preparation of a Strategic Action Programme (SAP) to outline the necessary legal, policy and institutional reforms needed to address the priority threats and their root causes as identified in the SADA for the NSAS with a focus on the environmental aspects of aquifer management.*

The SAP identified over one hundred management activities, actions and targets to strengthen the regional and national capacities of the countries to achieve the objectives and the vision for the NSAS. Moreover there was an extensive Monitoring and Evaluation section for SAP Implementation developed as well. Key specific Process, Stress and Environmental Indicators were prepared together with an outline of "next steps" for going forward. It is anticipated that the majority of these management actions will take place under the co-ordination of the Joint Authority and with the expected full co-operation between national institutes and the responsible government authorities.

The Nubian SAP has now been agreed upon at the technical level. Still required is the all important government endorsement in each country together with the need to further develop a more detailed understanding of the costs and benefits of the management actions outlined in the SAP. This in turn will enable the identification of gaps and the need to secure additional funding. In addition it will be necessary for the four countries to develop corresponding National Action Plans that reflect the regional goals and objectives in the NSAS. Once again it is expressed that should be done under the close supervision and co-ordination of the Joint Authority.

In summary, the Nubian SAP appears to be an effective document which can serve as a major and significant step in the preparation of a more substantive SAP along traditional GEF requirements. This SAP was produced during some of the most difficult times of the project during which there were lengthy pauses in implementation activities and political turmoil in the region. In form and substance it more closely resembles a "SAP outline" as it falls short of the SAP envisioned in the logical framework developed during the project. In addition it suffered from the need to meet project closure deadlines and, in the Legal and Institutional component, to better suit the needs of the member states. Nonetheless the SAP provides a fairly detailed road map for further SAP development and implementation. Perhaps its best contribution lies in that it identifies a range of pilot/demonstration activities to be undertaken in one or more countries with the expectation that the results will be shared and used to prepare a more detailed SAP program going forward.

The successful completion of Component #2 and attainment of *Project Objective #3* is rated as ***Moderately Satisfactory*.**

Component 3: Establishment of a Framework for developing the Legal and Institutional Mechanism/ - Convention for the NSAS

The Pro Doc describes this component as supporting the achievement objective 4, *"To establish a framework for developing an agreed legal and institutional mechanism towards a NSAS convention for joint four-partite management and rational use of the shared NSAS System".*
The conceptualization of this component underwent several evolutionary phases since it was first discussed at the project Inception meeting held in Tripoli in the summer of 2006. Even at this early stage it was evident that not all countries had a common vision of what a new Institutional Mechanism and a NSAS convention would entail. Most of the concern centered around the future role of the Joint Authority and its relationship within any new legal mechanism/structure to be designed within the framework of the project.

Given the lack of consensus on approach the countries agreed to defer commencement of activities under this Component until finally at a meeting of the Joint Authority, held in Tripoli in March of 2008 the JA decided to modify the title of Component 3 from “developing” to “enhancing the legal and institutional framework, etc”.

In summary it should be noted that there was almost unanimous consensus among all the interviewed participants that this Component was far too ambitious, as originally conceived, for an MSP project this size.

The successful completion of Component #3 and attainment of *Project Objective #4* is rated as ***Moderately Unsatisfactory***.

Sustainability

At the commencement of the Nubian project there was consensus agreement that the establishment of the Joint Authority for the Nubian Sandstone Aquifer System would lay the foundation for the sustainability of project activities. It was intended that the Joint Authority would be further strengthened during the course of the project and would assure the sustainability of project benefits after the project’s completion. Finally it was anticipated that clearly demonstrated benefits would encourage the member countries to provide the modest financial means necessary to sustain a more active and effective Joint Authority.

In addition it was foreseen that sustainability of project activities and post-project implementation would be assured by the continued involvement of key stakeholders during the project activities. Further, public awareness activities, targeted at important stakeholders would ensure the development of broad level support for jointly managing the NSAS. Based on the strong support of the four governments and other stakeholders, it was anticipated that the Nubian project could lay the foundation for a full GEF project to support incremental elements of SAP implementation and/or the support of other donors interested in facilitating cooperative management of shared water resources in Africa.

The development of the SAP recognized and responded to a number of risk factors that would influence future sustainability of project achievements. These included a series of recommendations and a list of realistic next steps designed to assure the gains of the Nubian would be sustained. These included:

- Attempt to have the SAP endorsed in the partner countries at the highest political level possible.
- Utilizing the SAP as the basis for a larger SAP implementation project, likely consisting of national demonstration projects which have promise for replication within individual countries and/or regionally.

The aforementioned approach, if adequately addressed, gives much greater confidence to expect that the Nubian SAP will attract further international attention and much needed additional donor support in the future. Taking into account the strictures of time and project resources the evaluation finds that the issue of sustainability was adequately addressed given the political context within which the Nubian region currently finds itself and the consequent stress this has placed on the functioning of the Joint Authority.

The overall sustainability of project outcomes is rated as ***Moderately Satisfactory*.**

Monitoring and Evaluation

The Pro Doc indicates that the monitoring of the project would be based on the project monitoring and evaluation plan as described in Component 5 "*Project Monitoring and Evaluation*." This was to be complemented by monitoring feedback from stakeholders, who would be consulted and supported to communicate with the Joint Authority and the Project Steering Committee on observed issues and specific objectives and interests.

The M & E Plan included a number of expected Activities (SC meetings and reports) a modest number of which were initially implemented during the project. However management issues lay at the heart of difficulties with the monitoring and evaluation process. Following the departure of the first project manager SC meetings were no longer convened and further quarterly reports were no longer produced. Annual APR/PIR reports continued to be filed to the conclusion of the project and were notable for the repeated requests from UNDP Country Office and the UNDP Regional Technical Advisor addressed to the IAEA requesting that they deal with escalating issues of project delivery slippage, management replacement and convening a meeting of the Steering Committee.

With the benefit of hindsight it is quite evident that a Mid-Term Evaluation would have been extremely beneficial for helping the Implementing and the Executing Agency recognize and address the management issues they encountered as these had a direct bearing on the M & E process.

The M&E arrangements are rated ***Moderately Unsatisfactory*.**

Recommendations

- Having project management deployed in the region is extremely critical and future SAP development and/or implementation should be conditional on NSAS countries agreeing to base a future PIU and project manager in the region.
- It is recommended that leadership and management skills for senior officials, especially in the JA be included in future SAP implementation activities.
- Continued regional instability needs to be balanced against the risk of significant momentum loss if follow-on activities are delayed indefinitely.

- Particular attention needs to be paid to language issues in the region with sufficient budget allocations needed for more translations of project outputs and activities into Arabic and French.
- The Nubian SAP provides a fairly detailed road map for further SAP enhancement and eventual implementation. It is recommended that countries seek to obtain early political support to enhance the SAP in order to undertake the full range of pilot activities leading to a better policy document for country endorsement.
- Without a follow-on project for SAP implementation there may not be sufficient motivation on the part of the NSAS countries to continue project efforts in a cohesive way. Much assistance is still required to enhance the Joint Authority as it appears to have ceased activity after the CEDARE project was concluded and only revived when the present Nubian MSP was announced.
- Given the potential cost benefit involved there is sufficient justification to warrant including a Mid-Term evaluation for all MSP projects.

Summary of Ratings

In Summary, this Evaluation finds the overall Results rating for the project to be Moderately Satisfactory. With respect to two main issues the Evaluation considered Sustainability with respect to project Outcomes as being Moderately Satisfactory and the project's Monitoring and Evaluation arrangements as being Moderately Unsatisfactory.

See table below for a compilation of all component ratings.

Table A: Summary of project ratings:

CRITERION	RATING
Project concept and design	Moderately Satisfactory (MS)
Project Governance	Unsatisfactory (U)
Project Implementation and Management	Unsatisfactory (U)
Country ownership/drivenness	Satisfactory (S)
Stakeholder participation in implementation	Moderately Satisfactory (MS)
Risk management	Moderately Satisfactory (MS)
Co-financing	Moderately Satisfactory (MS)
Cost-effectiveness	Moderately Satisfactory (MS)

CRITERION	RATING
M&E Arrangements	Moderately Unsatisfactory MU)
Overall Sustainability	Moderately Satisfactory (S)
Replication Communication	Moderately Satisfactory (S)
Objective 1: Prepare and agree on a Shared Aquifer Diagnostic Analysis (SADA) to jointly identify, understand and reach agreement on the priority issues, threats and root causes of the NSAS;	Satisfactory (S)
Objective 2: Address and fill key methodological, data and capacity gaps needed for strategic planning decisions, using appropriate technical approaches with a focus on isotopic techniques and applications under the supervision of the International Atomic Energy Agency (IAEA);	Satisfactory (S)
Objective 3:. Undertake the preparation of a Strategic Action Programme (SAP) to outline the necessary legal, policy and institutional reforms needed to address the priority threats and their root causes as identified in the SADA for the NSAS with a focus on the environmental aspects of aquifer management;	Moderately Satisfactory (MS)
Objective 4: Establish a framework for "enhancing" an agreed legal and institutional mechanism towards a NSAS convention for joint four-partite management and rational use of the shared NSAS System.	Moderately Unsatisfactory (MU)
OVERALL PROJECT RATING	Moderately Satisfactory (MS)

1. Introduction and Background

1.1 The Project Setting

The Project Document describes the Nubian Sandstone Aquifer System (NSAS) as one of the largest aquifers in the world covering approximately two million square kilometres of Northeast Africa in Chad, Egypt, Libya, and Sudan. The NSAS is the world's largest fossil aquifer system with its reserves estimated at 375,000 km3. In the arid desert areas of those countries that share the aquifer, groundwater is a primary source of water for human populations and the indigenous ecosystems. With growing population pressures, and decreasing water available

from other sources, there is increasing pressure to enhance the abstraction of this tremendously valuable resource that, under current climatic conditions and based on current knowledge, appears to be only marginally rechargeable. This increased pressure to use these shared groundwater resources, despite unclear knowledge of the transboundary impacts, represents a potential threat to a precious resource that if unchecked, could lead to deterioration of water quality and/or irrational water use with the potential to harm biodiversity, enhance land degradation processes or even lead to transboundary conflict.

1.1.1 Problems that the project seeks to address

This is a region that is wrought with water shortage amidst growing human populations. Destruction of ecosystems is leading to increased desertification and loss of habitat. One challenge in developing an adequate management strategy is the continued lack of sufficient knowledge about the aquifer needed to develop a rational use of the aquifer resources that can benefit the four countries. Further issues include poor management of water currently being exploited from the NSAS including loss of springs due to poor allocation of wells, change in the natural environment including species and habitats, poor understanding of local legislation and water rights, inadequate understanding of interactions between horizons, and impacts of development on the local and regional sustainability of groundwater. In general, there is a lack of a proper database and capacity to synthesize available information as a basis for determining and undertaking future investigations and developing strategies.

This MSP was a response to the above and is consistent with the GEF International Waters (IW) Focal Area which has, as one of its priorities, the protection and utilization of "shared" (transboundary) groundwater and ecosystems dependent on groundwater. Furthermore, the Operational Strategy places an emphasis on addressing transboundary water issues in Africa. The proposed project is consistent with GEF Operational Programme 9: Integrated Land and Water Multiple Focal Area. In addition, a rational utilization of the shared NSAS offers the opportunity to the NSAS countries to work collectively in managing not only the shared aquifer, but also in managing it inconsideration of groundwater dependent ecosystems (oasis, desert lakes etc.) that without cooperative management might otherwise be degraded. An appropriate use of the Nubian resource can also serve to prevent further land degradation in these fragile arid areas.

Vulnerability of the water resources of the NSAS systems is evident and amplified by planned expansion in southern Egypt and northern Sudan. An integration of the natural isotopes in the groundwater management programme is crucial to have early warning signals for these threats. Therefore a synthesis of existing groundwater data and the development of a monitoring network in all four countries will provide valuable information for the understanding and rational management of the NSAS. The establishment of a conceptual model for the aquifer system will be the basis for the planning of the management programme.

The IAEA has implemented national technical cooperation projects related to water resources management in the region for many years. Furthermore the IAEA has been working with three of the four countries(Egypt, Libya and Sudan) since March 2003 on a regional project funded by the IAEA for the NSAS. Based on this past and on-going cooperation, the IAEA has already established a good basis of cooperation with many of the key stakeholders in these countries.

1.1.2 Development objectives and outcomes of the project

The Long-term Goal of this MSP is to establish a rational and equitable management of the NSAS for sustainable socio-economic development and the protection of biodiversity and land resources. To achieve this goal, the Immediate Objectives of this MSP project as set out in the Project Document are as follows:

5. Prepare and agree on a Shared Aquifer Diagnostic Analysis (SADA) to jointly identify, understand and reach agreement on the priority issues, threats and root causes of the NSAS;
6. Address and fill key methodological, data and capacity gaps needed for strategic planning decisions, using appropriate technical approaches with a focus on isotope techniques and applications under the supervision of the International Atomic Energy Agency (IAEA);
7. Undertake the preparation of a Strategic Action Programme (SAP) to outline the necessary legal, policy and institutional reforms needed to address the priority threats and their root causes as identified in the SADA for the NSAS with a focus on the environmental aspects of aquifer management;
8. Establish a framework for developing an agreed legal and institutional mechanism towards a NSAS convention for joint four-partite management and rational use of the shared NSA System.

The overall expected results would contribute to strengthening the institutional, legal and analytical frameworks for the sustainable management and use of the shared NSAS. The project will result in a clear understanding of transboundary issues, problems and potential solutions (SADA), a process for and significant progress in achieving a jointly developed and agreed strategic approach and action programme(SAP) to address real and potential problems, as well as a framework for developing an appropriate legal mechanism e.g. a convention etc. to underpin transboundary cooperation represented by a strengthened Joint NSAS Authority. This enhanced framework and intensified cooperation will set the basis for better management of the shared aquifer resources. Links and networks between international and national organizations to ensure future co-operation will also be established. A full integration of the NSAS activities in the respective natural resource management programmes at a national and regional level will be promoted. The basis for establishing an operational monitoring system will be available to enable the observation of any changes in the water regime and related ecosystems. Consideration will also be given to the inter-relatedness of water resource management issues with the Nile River Basin in Egypt and Sudan and thus cooperation will be assured with the Nile Basin Initiative as appropriate.

The impact of the project should support the development of sustainable socio-economic conditions in an area that depends heavily on the availability of water. Furthermore, it will be beneficial to all involved countries in terms of the control of desertification and the protection of biodiversity.

The proposed duration of the MSP was to be 30 months. UNDP was the GEF Implementing Agency for the project. The International Atomic Energy Agency (IAEA) served as Executing Agency as well as the lead agency for the technical components of the project given its general expertise in the groundwater sector and its specific expertise in the utilization of isotope techniques. The project was to be coordinated in the field by a Project Implementation Unit (PIU).

1.1.3 Main Stakeholders

The Project Document identified the main stakeholders as the relevant Ministries mandated to lead on water policy in the NSAS countries. Representatives from these ministries have been instrumental in the development of this MSP. The scientific impetus with data and information on the Nubian originated to a large extent through the Joint Authority and the national water ministries in the four NSAS countries involved in aquifer research and through previous collaboration with the IAEA. A technical consultation workshop on the aquifer system and for the formulation of the MSP project was held at the IAEA in Vienna in March 2004 and was attended by national water resources officials and groundwater experts from Chad, Egypt, Libya and Sudan as well as representatives of the Implementing Agency, UNDP-GEF, the Executing Agency IAEA and representatives from UNESCO-ISARM and CEDARE.

Accordingly the direct stakeholders and participants in the project can be grouped as follows: (a) national officials in water, land and environmental administrations; in the water and land use sub-sectors; and in other national agencies at central and local levels of the country governments (b) local communities and the direct water and land users and beneficiaries, and (c) the sub-regional and bi-lateral bodies and in particular the Joint Authority.

Based on the above the MSP was to develop a full stakeholder involvement plan during the inception phase of the project. It was foreseen that the development of the SADA and the SAP would be a participatory process that would include important stakeholders as agreed during the inception phase.

1.1.4 Results expected

The MSP ProDoc foresaw the end of project situation where there was:

- for Component #1; an agreement reached on a SADA and a better understanding of the priority issues, threats and root causes of the NSAS.
- for Component #2; a Strategic Action Programme (SAP) which outlines the necessary legal, policy and institutional reforms needed to address the priority threats and their root causes as identified in the SADA for the NSAS.
- for Component #3; a draft agreement on a framework document for the establishment of an institutional mechanism for the NSAS.
- for Component #4; a strengthened regional/national coordination mechanism for integrated management and rational use of the NSAS System.
- for Component #5; an agreed monitoring and evaluation plan and subsequently completed evaluation of project progress and results based on project objectives and performance indicators.

1.2 The Evaluation

1.2.1 The GEF Monitoring and Evaluation Principles

In accordance with the monitoring and evaluation policy of the GEF[1], this evaluation is guided by, and has applied, the following principles:

Independence The Evaluator is independent and has not been engaged in the Project activities, nor was he responsible in the past for the design, implementation or supervision of the project.

Impartiality The Evaluator endeavoured to provide a comprehensive and balanced presentation of strengths and weaknesses of the project. The evaluation process has been impartial in all stages and taken into account all the views received from stakeholders.

Transparency The Evaluator conveyed in as open a manner as possible the purpose of the evaluation, the criteria applied and the intended use of the findings. This evaluation report aims to provide transparent information on its sources, methodologies and approach.

Disclosure This report serves as a mechanism through which the findings and lessons identified in the evaluation are disseminated to policymakers, operational staff, beneficiaries, the general public and other stakeholders.

Ethical The Evaluator has respected the right of institutions and individuals to provide information in confidence and the sources of specific information and opinions in this report are not disclosed except where necessary and then only after confirmation with the consultee.

Competencies and Capacities The terms of reference provided to the Evaluator appear in Annex 1 and the methodology for the assessment of results and performance is described below (section 1.3).

Credibility This evaluation has been based on data and observations which are considered reliable and dependable with reference to the quality of instruments and procedures and analysis used to collect and interpret information.

Utility The Evaluator has strived to be as well-informed as possible and this ensuing report is considered as relevant, timely and as concise as possible. In an attempt to be of maximum benefit to stakeholders, the report presents in a complete and balanced way the evidence, findings and issues, conclusions and recommendations.

1.2.2 Evaluation objectives and Terms of Reference

The Terminal Evaluation is intended to provide a comprehensive overall assessment of the project and serves as an opportunity to critically assess administrative and technical strategies,

[1] Global Environment Facility (2006) *The GEF Monitoring and Evaluation Policy*.

issues and constraints. The evaluation sets about attempting to provide answers to the following questions:

- Did the project achieve its objectives?
- Did it do it well?
- Are the results likely to be sustainable

Like all GEF Terminal Evaluations, this TE is being carried out:

- To promote accountability and transparency, and to assess and disclose levels of project accomplishments;
- To synthesize lessons that may help improve the selection, design and implementation of future GEF activities;
- To provide feedback on issues that are recurrent across the portfolio and need attention, and on improvements regarding previously identified issues; and,
- To contribute to the GEF Evaluation Office databases for aggregation, analysis and reporting on effectiveness of GEF operations in achieving global environmental benefits and on quality of monitoring and evaluation across the GEF system.

1.2.3 Mission activities and assignment timeline

The evaluation was conducted by a single independent evaluator and was scheduled to take place between August and November, 2011. The evaluation followed the standard UNDP/GEF guidelines stipulated for this activity and commenced near the conclusion of the project cycle. In particular the Evaluator benefited from the opportunity to attend the Final regional meeting of the Nubian (SAP) technical team which took place in Vienna on July 25-26, 2011. This opportunity to place 'name to face' for some of the key country representatives was invaluable for making introductions for the telephone interviews which followed.

1.3 Methodology and approach

1.3.1 Evaluation boundaries

By the time the Evaluator was engaged to attend the Final Regional meeting of the Nubian SAP there was only limited activity taking place in the Nubian project. The utility of a visit to the countries in the region was discussed and considered, however with no demonstration projects to visit and with continuing widespread regional instability from the "Arab Spring", the Evaluator did not anticipate any substantial added value that such a visit would bring to the evaluation process. Accordingly, the greatest reliance was placed on telephone interviews, follow-up emails and completed questionnaires which, in the end, proved to be a satisfactory and effective means of providing adequate background information and sufficient detail for the purposes of conducting the within evaluation.

A further boundary on the scope of this evaluation related to the technical aspects of the developed SADA and SAP which is not within the evaluator's terms of reference. However the process applied to produce the SAP as well as the likelihood of its sustainability, remains part of this evaluation.

1.3.2 The approach adopted

The evaluation process comprised four phases. The first phase was one of data and information gathering. This process started with a review of relevant documents made available electronically by the IAEA and participating project specialists. This was supplemented by attendance at the previously mentioned Final regional meeting of the Nubian SAP which took place in Vienna on July 25-26, 2011. More project documents were provided here and initial introductions were made to IAEA officials, project consultants and members of the SAP technical team. These were further supplemented by additional documents provided by the UNDP Bratislava Regional Centre. This proved sufficient to capture a broad assortment of background views and opinions at the beginning of the evaluation process.

The second phase focused on telephone interviews and questionnaires to key players representing participating agency partners, beneficiary countries and management officials. In addition, relevant websites were visited and studied throughout the course of the evaluation. The third phase consisted of analysis, emailing and drafting from home base. This phase concluded with the production of a draft Terminal Evaluation report which was forwarded to the IAEA and UNDP who shared it with Heads of Delegation of participating countries.

The fourth and final phase refined this draft in the light of received comments and resulted in the submission of this Final report. Guidance provided by GEF and UNDP evaluation documents was adhered to in the preparation of this terminal evaluation. As noted in the Acknowledgements, the Evaluator benefited greatly from the wide spectrum of views, opinions and advice that he received during the course of his work however the conclusions reached and the recommendations made represent the independent views of the Evaluator alone.

1.3.3 Documents reviewed and consulted

The Evaluator was provided with an initial list of documents in the Terms of Reference. Further advice on relevant documents, as well as the documents themselves in most cases, were provided by the IAEA and project consultants who attended the previously referred to Final Regional SAP meeting. References to documentation are noted, in most cases, in footnotes and the full list of documents reviewed and/or consulted by the Evaluator is in Annex 2.

1.3.4 Consultations

Subsequent consultations took place by phone and email and numbered some 20 individuals. These ranged from the key agency partners (IAEA, UNDP and UNESCO) to project personnel and consultants, various government officials, technical specialists and the UNDP Country Office in Egypt. Most telephone interviews followed the same pattern, namely, a brief introduction on the purpose of the mission followed by an identification of the relationship that the person interviewed had with the project, and his/her views on the project. Particular

emphasis was placed on whether the person being interviewed felt that the project had achieved its objectives, whether it had done this effectively, and whether the project's products and benefits were likely to be sustainable. Face-to-face consultations were were limited to the participants attending the Final Regional SAP meeting in Vienna. A full list of persons consulted by the Evaluator is found in Annex 3.

1.3.5 The rating system

GEF guidance requires certain project aspects to be addressed by a terminal evaluation and a commentary, analysis and rating is required for each of:

Project concept and design

Stakeholder participation in project formulation

Implementation approach

Monitoring and evaluation

Stakeholder participation

Attainment of Outcomes and achievement of Objective.

Each of the aspects has been rated separately with brief justifications based on findings. In addition, the various project elements have also been rated, as has the project as a whole.

The standard GEF rating system was applied, namely:

Highly Satisfactory (HS): The project has no shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency

Satisfactory (S): The project has minor shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency

Moderately Satisfactory (MS): The project has moderate shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency

Moderately Unsatisfactory (MU): The project has significant shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency

Unsatisfactory (U): The project has major shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency

Highly Unsatisfactory (HU): The project has severe shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency

1.4 Structure of this report

The Evaluator has made an effort to keep this report brief, to the point and easy to understand. It is made up of four substantive parts. Following the executive summary that encapsulates the essence of the information contained in the report, the first part provides the introduction and the background to the assignment. It starts with a brief introduction to the project and it then explains the purpose of the evaluation, exactly what was evaluated and the methods used.

The next part is the main substantive part of this report and comprises four inter-related sections. It presents the findings of the evaluation exercise in terms of the basic project concept and design, its implementation, administration and management, its achievements, results and impacts, and the potential for sustainability of the products and services that it produced. The findings are based on factual evidence obtained by the Evaluator through document reviews and consultations with stakeholders and beneficiaries.

The third part is the conclusions section which gathers together a summary of the ratings given and conclusions that had been reached throughout the rest of the report and augments them to create a cohesive ending arising from the investigation. This section in turn leads to the final section comprising the recommendations.

2 Findings: Project Formulation

2.1 Project Design

The Nubian project was designed in conformity with the priorities stated for the GEF International Waters (IW) Focal Area which advocate the protection and utilization of “shared” (transboundary) groundwater and ecosystems dependent on groundwater. It is also consistent with the GEF Operational Strategy which places an emphasis on addressing transboundary water issues in Africa. As an additional formality the Nubian project appears consistent with GEF Operational Programme 9: Integrated Land and Water Multiple Focal Area and is properly conceived to support GEF’s Strategic Priority #2 “Expand global coverage of foundational capacity building.”

The project was further intended to provide targeted learning in the frame of enhancing a joint management framework that would ensure sustainability of the Nubian intervention. The project was to address not only transboundary water management, but also the close linkages with land degradation and ecosystem protection.

In this regard the Project Document stipulates that the long-term goal of the project is to establish a rational and equitable management of the NSAS for sustainable socio-economic development and the protection of biodiversity and land resources. To achieve this goal, the Nubian MSP project followed the classical approach taken by GEF for this type of intervention. This approach envisaged the preparation of a Transboundary Diagnostic Analysis followed by the preparation of SAP which would identify policy, legal and institutional reforms and investments needed to address the priority transboundary problems.

These general principles were adapted to the present context of the Nubian MSP and can be restated as follows:

i. Prepare and agree on a Shared Aquifer Diagnostic Analysis (SADA) to jointly identify, understand and reach agreement on the priority issues, threats and root causes of the NSAS;
ii. Address and fill key methodological, data and capacity gaps needed for strategic planning decisions, using appropriate technical approaches with a focus on isotope techniques and applications under the supervision of the International Atomic Energy Agency (IAEA);
iii. Undertake the preparation of a Strategic Action Programme (SAP) to outline the necessary legal, policy and institutional reforms needed to address the priority threats and their root causes as identified in the SADA for the NSAS with a focus on the environmental aspects of aquifer management;
iv. Establish a framework for developing an agreed legal and institutional mechanism towards a NSAS convention for joint four-partite management and rational use of the shared NSAS System.

The proposed duration for the Nubian MSP was originally intended for 30 months, however as will be seen in subsequent sections of this report, the timescale proved to be inadequate and, in the case of the establishment of an agreed legal mechanism, - exceedingly ambitious. To their credit, the institutions providing oversight in the project quickly recognized the inherent deficiencies of this component and attempted to remedy the situation, albeit with limited success.

It is the Evaluator's view that the project's deficiencies in design were nonetheless capable of remedial intervention with proper risk management. Accordingly this evaluation will show that any failure to achieve project outcomes lies less in the field of project design than in other sectors such as risk management, project management, stakeholder involvement and adherence to the M&E Plan. These will be addressed in more detail in subsequent sections of this report.

Overall rating for the project concept and design is **Moderately Satisfactory.**

2.2 Linkages between the project and other interventions

The Nubian ProDoc mentions a number of water management initiatives that predate the current MSP and were on going in the NSAS at the time of project design. These initiatives were enumerated and specifically identify the Nubian Joint Authority as a beneficial link from which mutual benefits would be derived during further cooperation.

The NSAS region has experienced numerous interventions in the past two decades and has displayed significant baseline activity, especially at the national level. All these interventions collectively raised awareness in their respective countries and laid the groundwork for the transboundary Nubian MSP which followed. Below is a short sampling of some of these national interventions and the problems they attempted to address.

CHAD

Chad's groundwater resources are in general very poorly understood because of the lack of detailed studies on the country's different groundwater bodies. The national authorities have responded to this problem by adopting a national water resources strategy that will investigate the possibility of introducing state-of-the art technology to extract groundwater from aquifers economically. Some research has already been carried out on the geology and hydrogeology of Chad working from the north to the south of the country. Investigations concerning the NSAS have been conducted in the extreme northeast of the country. Chad has identified sites for monitoring wells in the aquifer area and is currently in the process of identifying donor funding for their implementation. Furthermore, additional domestic funding sources from the national petroleum and the poverty eradication funds can be mobilized for priority activities and installations in Chad under the NSAS cooperation.

EGYPT

Since groundwater is the only source of water outside the reach of the river Nile in the Egyptian desert, the role of groundwater has been given more emphasis in recent national water policies as manifested in the report from the Ministry of Water Resources and Irrigation (1998). Current research activities in order to enhance available water resources include methodology development for desalination of brackish groundwater, artificial recharge and storage for drinking, industrial, and agricultural uses. Egypt is installing 15 observation wells in the southern part of the NSAS in areas close to the Egypt-Sudan border. Past collaboration with the IAEA aimed to assess groundwater resources in the Farafra and Bahariya depressions in the Nubian Sandstone Aquifer for sustainable development of these desert regions. All these were essential for directing Government policy for developing new communities and population distribution outside the crowded Nile Valley.

LIBYA

Since 1970, the Libyan government has invested a lot of time and money in the field of water investigations and in building the infrastructure for agricultural projects in the coastal and desert areas. The massive oil exploration in the country provided a major source for updating hydrogeological data which was subsequently used to evaluate groundwater resources and which led to the discovery of three huge fresh water reservoirs in the Sahara desert; Hamada, Murzuq and Kufra basins.

Studies of these basins led to the implementation of several agricultural projects in remote areas in the desert and in Kufra a large irrigation programme has been launched for wheat production. All of these developments encouraged the Libyan authorities to continue studying the water resources in the three basins in detail and to seek more information from other neighboring countries sharing the basins.

SUDAN

The Nile River system, with the confluence of the White and Blue Nile rivers at Khartoum, is a major source of water for Sudan and forms an important north-south axis within the country. The fast growing population of the country and the switch of large parts of the population from sorghum to wheat as a staple food has meant that the Government is using more land in the

two northern states to grow wheat thereby putting a big strain on the limited water resources. Such economic activities are subject to both human misuse and naturally harsh conditions such as land degradation, desertification, and repeated droughts.

These adverse conditions are coupled with poorly developed infrastructure, long distances to markets, a shortage of public finance, and planning limitations, all of which serve to deter development.

A number of IAEA-assisted technical cooperation projects have been executed for some years, mainly to investigate the influence of the Nile River system and big seasonal wadis on the adjacent parts of the Nubian Sandstone Aquifer System (NSAS). While information gathered has been very useful and has also allowed for the updating of hydro-geological maps, there is still an urgent need for additional isotopic investigations in the NSAS area and other parts of Sudan.

By way of general summary, the IAEA was very actively cooperating with countries in this region to address water resource management issues. The IAEA was a partner and co-funder in the UNEP/OSS/GEF Iullemeden Aquifer project and UNEP/OSS/GEF Northern Sahara Aquifer project. It is also providing technical assistance to Nile Basin countries to develop a more accurate, complete water balance with activities currently focused on the water balance of Lake Victoria. Currently, the IAEA was the executing agency and principal co-funder of this MSP has already been working with three of the four NSAS countries (Egypt, Libya and Sudan) since March 2003 on a regional project which aims to promote and support the development of a framework for the sustainable management and use of the NSAS.

2.3 Country Ownership

The four NSAS countries already have a lengthy history of early cooperation on the management of the NSAS water resources. Egypt and Libya initiated the process in the early 1970s and formalized it in1992 with the creation of the Joint Authority for the Management of the NSAS System. Sudan joined the Joint Authority in 1996 and Chad followed in 1999. To date the Joint Authority remains the main political driving force for cooperation in the NSAS and provides the necessary umbrella ‘ownership’ coverage for the Nubian MSP.

It is important to note that the objectives of the Joint Authority were (i) to oversee strategic planning, (ii) to develop a NSAS monitoring programme and (iii) to exchange data and information on the respective water resources and extraction. The Nubian MSP complements the above objectives and attempts to provide additional transfer of ‘know how’ to the region. All of this will serve to benefit the Joint Authority and simultaneously leverage country ownership of the Nubian project.

Country ownership was further enhanced owing to the Joint Authority’s engagement of high level organizations in the respective countries and is built on agreements on data sharing, monitoring and exchange with incorporation of data in a regional information system. The four countries have adopted a regional monitoring network and agreed to continue the joint monitoring of the aquifer. A regional strategy has been formulated focused on joint studies and assessment of current and future impacts from growing extractions with recommended strategies to minimize negative impacts including cross-border conflicts, through e.g. optimisation of yield versus draw downs and protection of groundwater quality.

In order to implement common strategies, the Joint Authority requires further enhancement and strengthening. The Evaluator found that there is a generally held perception that the Joint Authority could benefit from taking a much more assertive and proactive view of its mandate and authority. The Nubian MSP project activities have attempted to meet this challenge and have provided the Joint Authority with better information and access to monitoring resources. There is reason to believe that the engagement with the Nubian MSP will serve to enhance the Joint Authority's confidence enabling it to appear as a stronger advocate for NSAS issues in the political arenas of the respective countries.

The Evaluator finds that there was a moderately high level of country ownership in the Nubian MSP which has its rationale, both in the institutional arrangements that were enhanced and also the in considerable number of SADA and SAP activities which mobilized a wide spectrum of technical resources and personnel.

The country ownership/drivenness is rated **Satisfactory**.

2.4 Governance: Implementation and Institutional Framework

The governance and management structure of the Nubian MSP was both ambiguous and convoluted. Surprisingly the Pro Doc makes only a cursory reference to this important component and one is forced to look further and seek guidance from other sources. These begin with Annex 1 of the Pro Doc which contains the PDF-A development report and a few more words on project governance but sheds little light on the composition of institutions, their mandate or authority.

These latter issues are first dealt with in a substantive way in the Inception Report from November 2006. Here the roles of the Implementing and Executing Agencies are well defined and first stated clearly. From a review of the aforementioned three documents these roles can be described as follows:

1. The Nubian MSP is to be implemented by the UNDP through its Bratislava Regional Centre (BRC) and is responsible for overall project delivery and reporting directly to GEF.

2. The MSP is to be executed by the International Atomic Energy Agency (IAEA) based in Vienna and was to lead on the technical components of the project given its expertise in the groundwater sector based on its utilization of isotope techniques. As the Executing Agency, IAEA is responsible for assuring that the project is conducted according to the project document and delivers the expected results; this includes responsibility for overall project management, working directly with the four countries and steering the technical components of the project. The Evaluator was informed that this was UNDP's first attempt to promote the IAEA as an executing agency for a GEF International Waters project.

The previously mentioned documents make further reference to the following additional project implementation arrangements:

3. The Joint NSAS Authority (JA) was to act as the lead coordinating Institution. The JA was established by a bilateral Egypt - Libya protocol dating from 1992 with a defined mandate and with plans for an Executive Director and permanent secretariat in Tripoli. Chad and Sudan joined the Nubian cooperation in 1998 and the Authority operates branch offices in the water ministries of the four countries. As described in the Inception Report, one of the main purposes of the Nubian MSP was to enhance, strengthen and activate the JA; including the legal and institutional framework, the management tools, addressing data gaps and enhance mechanisms and access for active joint use and communication to share the database and decision-support through the Nubian Aquifer model.

4. UNESCO and its ISARM partners as co-funding and cooperating Agencies.

5. Other potential partners such as CEDARE were to be involved as agreed on by the participating countries. In addition the JA would advise on detailed roles of other intergovernmental organizations and make recommendations on their exact involvement and cooperation.

Once again it is the Inception Report which first breaches the subject of governance in a meaningful way. Reference is specifically made to the creation of a Project Steering Committee (PSC) and there is an attempt to outline its composition and authority. However the report indicates the countries struggled with reaching a consensus on the composition of the PSC and did not clarify its authority during this meeting. Reference was made to a 'constitution' being agreed to for the PSC and that 'terms of reference' were 'to be conducted'. Neither were attached to the Inception Report and no meaningful reference is made to them again in any subsequent documents.

The above deficiencies were finally clarified during the First Meeting of the PSC where the role and composition of the PSC appears to have been specifically addressed and agreed upon. However one over arcing issue that appears to have dogged the project from start to finish is the blurring of distinctions between the role of the JA and the PSC in the MSP project. This issue was raised on several occasions during the evaluation process where various individuals commented on the fact that key members of the PSC were also members of the JA and it was unclear in which capacity they were acting during key project meetings. The Evaluator draws no conclusions from such commentary as no negative or positive impacts were adduced, however the issue is obviously a point of concern and the precise role of the JA should be addressed in any successor projects that may be designed.

During the course of the project there was one other PSC meeting convened in January 2009 although several references allude to the expectation that three such meetings would take place during the course of the project. Moreover there is evidence of repeated requests from UNDP to urgently call more frequent PSC meetings owing to serious management issues that were arising during project implementation.

The above governance issues were further complicated by the uneasy relationship that appears to have existed between IAEA and UNESCO. It is clear from the evaluation process that neither

institution had its expectations met from its perceived relationship with its counterpart in this project. Given the excellent institutional reputation that both organizations possess it would seem that their failure to arrive at a common consensus speaks less to their institutional skills and resources and more to their managerial shortcomings which rendered them unable to recognize and confront their issues within a reasonable period of time. Regrettably this did not happen and this raises questions as to the adequacy of the oversight role played by the PSC and the managerial role of the IAEA during critical times in the project.

It should have been manifestly clear at the very outset that the Nubian MSP was going to be a challenging project to implement in a regional and political environment not known for its conducive conditions for project implementation. This challenge was evident even before the events of the Arab Spring descended on the region and effectively brought all activities in the project to a halt.

With the benefit of hindsight one can now see how the strengths and weaknesses of some of the key agencies were mismatched for the task at hand. In particular the comparative advantages of the IAEA appear to have been misaligned when their unique and specific technical experience in isotope testing and modelling was partnered with the larger and more demanding role of project implementation of a GEF IW project. This proved to be a risky endeavour as the GEF IW management model has been a tried and refined model now for over 15 years and represents a specific skill set for successful IW project implementation in all parts of the globe. Unfortunately the IAEA was unable to demonstrate the specific experience nor the institutional management practices which allow for the type of rapid and robust responses necessary to conduct and administer multiple ongoing project GEF IW activities in several countries at the same time. The latter issue proved to be a significant deficiency and will be further addressed in the subsequent sections dealing with Management and Risk Assessment.

Project Governance is rated as **Unsatisfactory.**

2.5 Management Arrangements

The Pro Doc speaks of a Project Implementation Unit (PIU) to be created under the supervision of a regional coordinator, who would be supported by technical and administrative staff as well as international expertise as needed. The person would be responsible for reporting to the PSC and coordinating project activities on the ground in one of the NSAS countries. Anticipating SAP implementation at some future date, the Pro Doc envisioned that such a PIU "would be (also be) crucial for the eventual implementation of activities under a full sized project".

The Inception Report further elaborates on the PIU and indicates that it should be staffed by a project manager to be recruited by IAEA and initially supported administratively by IAEA HQ. The report continues, "The project manager is to be based initially in Vienna (in a follow-up GEF project, the project manager and any other project staff should be moved to an agreed site in the region) with significant travel in each country. There is a TOR already prepared and available, and the candidate should be Arabic, English and French speaking/writing".

From interviews and project documents it appears there was a 6-8 month delay in recruiting the Project Manager owing, at least in part, to a delay in the signing of the Nubian Pro Doc. It is also

clear from relevant interviews that the countries expected and wished to have the PIU based in one of the NSAS countries in the region. Unfortunately the countries were unable to formally agree on which country should host the PIU and as a result the decision was made to base the Project Manager in an office within the IAEA headquarters in Vienna.

There is no doubt the delay in the signing of the Pro Doc and indecision of where to host the PIU contributed significantly to the project encountering a slow start and delaying the development of a project 'presence' in the region. In turn, the move to Vienna also served to detach and remove the Project Manager from the 'on the ground' pulse of day to day management and the ebb and flow of project activities.

There is evidence in the minutes of the First Steering Committee meeting that project activities picked up considerably once the Project Manager was appointed. This is supported in the APR/PIR for 2007 as well. Unfortunately there did not appear to be a renewed push to relocate the Project Manager back to the region and the situation took on a 'best case scenario' approach where the person did what he could from the far abroad. This situation eventually took a turn for the worse when the Project Manager announced that he would leave his post in April of 2009. While there may be many reasons for a person to terminate one's contract the situation here suggests that there may be inherent IAEA institutional inflexibilities that contributed to the Project Manager's decision. Such a scenario would once again point to critical managerial failure and the lack of appreciation for the systemic consequences this would have on project implementation.

After some deliberation where a new search for a replacement manager was considered, the IAEA made the decision to manage the Nubian project 'in-house' from Vienna. Accordingly an IAEA staff member was assigned the managerial duties for the Nubian MSP which were in addition to his already existing responsibilities at IAEA. Unfortunately there is sufficient evidence to suggest that this decision contributed to further reducing the project profile and activity implementation in the region. Moreover the decision exposed internal practices in the financial/administrative culture of IAEA where the Technical Cooperation (management side) and the Nuclear Applications (technical side) did not demonstrate a sufficient level of cooperation thereby leading to further delays and inefficient delivery of project activities. This unfortunate state of affairs lasted till the end of the project and suggested managements's waning interest in organizing further project activities and convening a Third Project Steering Committee meeting as required.

As mentioned earlier the slow process of management detachment from the region did not appear to be met with any significant effort to reverse the situation nor did the full consequences of such benign attention appear to be fully appreciated. From the various project reports and evaluator interviews it would appear that the project was struggling significantly even before the events of the Arab Spring (2011) set in.

The Project Implementation and Management arrangement is rated **Unsatisfactory.**

2.6 Analysis of Logical Framework Approach

A GEF published reader guide describes the Logical Framework Approach (LFA) as an open set of tools for project design and management. Its purpose is to provide a clear, rational framework for planning the envisioned activities and determining how to measure a project's success, while taking external factors into account.

Unfortunately the Nubian Pro Doc did not contain an extensive LFA and the only reference to these tools appeared in the section under Monitoring and Evaluation which will be reviewed later in this report. Given the managerial problems encountered in the implementation of the Nubian MSP, it is the Evaluator's belief that a pre-existing LFA would have immensely benefited the management sector as well as the project governance institutions, especially the PSC and the Joint Authority.

2.7 Stakeholder Participation

The Pro Doc expressed a significant awareness of the need to involve input from key stakeholder groups to develop and implement the Nubian MSP. Preliminary assessments had already established that the main stakeholders would be the relevant Ministries mandated to lead on water policy in the Aquifer countries. The scientific impetus with data and information on the Nubian originated to a large extent through the Joint Authority and the national water ministries in the four NSAS countries that were involved in aquifer research and through previous collaboration with the IAEA.

These efforts were supplemented by further technical consultation workshops attended by national water resources officials and groundwater experts from Chad, Egypt, Libya and Sudan as well as representatives of the Implementing Agency, UNDP-GEF, the Executing Agency IAEA and representatives from UNESCO-ISARM and CEDARE. Thereafter the preparation of the draft MSP was coordinated by the IAEA and circulated to the countries and the international agencies for consideration.

The involvement of key stakeholder groups in the development and implementation of the Nubian MSP was made that much easier as the IAEA had already implemented national technical cooperation projects related to water resources management in the region for many years. Further the IAEA had been working with three (Egypt, Libya and Sudan) of the four countries since March 2003 on a regional project funded by the IAEA for the NSAS. This earlier IAEA cooperation served as an excellent platform for taking the Nubian MSP from the design to the implementation stage.

Based on these efforts, a full stakeholder involvement plan was prepared during the inception phase culminating in a major report in 2008. A key aspect of this report was a matrix presentation which classified stakeholders into different groups and graded their respective influence and importance. This in turn helped identify assumptions and risks which needed to be managed through project design and implementation.

The report foresaw the development of the SADA and the SAP through a participatory process involving all the important stakeholders agreed during the inception phase. These were grouped as follows:

(a) national officials in water, land and environmental administrations; in the water and land use sub-sectors; and in other national agencies at central and local levels of the country governments;

(b) local communities and the direct water and land users and beneficiaries, and

(c) the sub-regional and bi-lateral bodies and in particular the Joint Authority.

Eventually two successful National stakeholders meetings were conducted in Egypt and Sudan. The Second Steering Committee minutes report the participants appreciated their involvement very much and mentioned that it was the first time they were asked to participate in such high level meetings discussing important development plans.

The Project also sought to consult with and involve NGOs and civil society, but struggled to find the most effective way to do it in the NSAS region where NGOs and civil society are relatively new and somewhat controversial concepts. The Project also made attempts to implement some public awareness activities and outreach campaigns. However it was difficult for the Evaluator to assess the effectiveness of this work as there were no target groups or impact indicators used by the MSP to measure any success. In this regard a public awareness campaign would have benefited from a better strategic focus, however it would be fair to say that the overall efforts made during project implementation were adequate and commensurate with the social and political realities in the NSAS region.

Stakeholder participation at the project implementation level is rated **Moderately Satisfactory.**

2.8 Monitoring and Evaluation

The Pro Doc indicates that the monitoring of the project would be based on the project monitoring and evaluation plan as described in Component 5 "*Project Monitoring and Evaluation*." This was to be complemented by monitoring feedback from stakeholders, who would be consulted and supported to communicate with the Joint Authority and the Project Steering Committee on observed issues and specific objectives and interests.

The M & E Plan included the following Activities:

• Regular (quarterly) progress reporting to UNDP/GEF, IAEA as well as the Project Steering Committee,

• At least 3 meetings of the Project Steering Committee,

• Preparation of project implementation plan including budget (updated as needed,)

• Annual GEF APR/PIR,

• One independent project evaluation exercise (end of project.)

In actuality the Nubian project utilized a modest number of the above monitoring modalities which appeared to closely follow the fluctuating state of Project Management in the project. As mentioned previously, the first project manager was hired some time after project commencement and served in his capacity for approximately one year till January 2009. During his tenure (2008) it would appear that quarterly reports were indeed prepared and submitted to the responsible agencies and an APR for 2008 was prepared as well. Confirmation of this is to be found in the minutes of the Second SC meeting held in Vienna in January, 2009.

Following the project manager's departure there were no more SC meetings convened and further quarterly reports no longer appear to be evidenced. Annual APR/PIR reports continued to be filed to the conclusion of the project and were notable for the repeated requests from UNDP Country Office and the UNDP Regional Technical Advisor addressed to the IAEA requesting that they deal with escalating issues of project delivery slippage, management replacement and convening a meeting of the Steering Committee.

It is also unclear whether the project implementation plan setting out timelines for meeting the various objectives was ever updated on an annual basis. In retrospect this issue would appear to be moot as in the absence of further SC meetings there would no longer be a forum to review progress and/or slippage in the fulfilment of the annual work plan.

Given the above M&E developments encountered in the Nubian project it would appear that the IW Results Based Management Framework is of little assistance in circumstances when project oversight deteriorates. With the benefit of hindsight it is quite evident that the Nubian project was one instance where a Mid-Term Evaluation would have greatly benefited both the Implementing and the Executing Agency in coming to terms with the management issues they encountered.

The M&E arrangements are rated **Moderately Unsatisfactory.**

2.9 Cost-effectiveness

The Pro Doc describes the project as being cost effective with a highly leveraged co-funding component. The fact that the project redesigned its Outputs in the initial stage of the project and focused most of its resources on developing the key outputs of a SADA and SAP, certainly contributed to the project being very cost effective. Moreover the Nubian MSP benefited from the fact that there was a strong baseline to build upon the already existing Joint Authority, national commitments, on-going IAEA projects and planned co-funding as well as the linkage with the ISARM initiative and other transboundary aquifer projects in the region.

Finally from a management/administrative point of view the decision to locate the PIU at the IAEA headquarters in Vienna no doubt contributed to a significant saving in administrative overhead however, as was noted earlier, this came at a significant price in effectively delivering

other outputs in the project.

The cost-effectiveness is rated **Moderately Satisfactory**.

2.10 UNDP Comparative advantage and role as Implementing Agency

UNDP Comparative advantage and role as Implementing Agency UNDP's involvement in the region can be traced back to at least 2003 when it agreed to work with the IAEA to promote and support the development of a framework for the sustainable management and use of the Nubian aquifer systems among the countries that share the aquifer. This arrangement brought together the comparative strengths of two major institutions, UNDP with its substantial experience in delivering GEF IW projects and IAEA with its unique technical capabilities in the use of isotope techniques as a tool for expanding and consolidating scientific knowledge for aquifer systems.

As Implementing Agency, UNDP was responsible to the GEF for the timely and cost-effective delivery of the agreed project outputs. It was to achieve this through its understandings with the governments of the participating countries and its contractual arrangement with the IAEA as Executing Agency. UNDP had an obligation to ensure accountability, and its efforts in this respect were spearheaded by the UNDP/RBEC Regional Support Centre in Bratislava. Within the project the Egyptian Country Office played an important role in supporting project delivery in the region and to the PIU in particular during the time a Project Manager was deployed in the region.

One major shortcoming identified elsewhere in this evaluation was that project oversight did not improve the project's M&E and adaptive management approach, and in so doing did not fine-tune the log frame to bolster the project's effectiveness and efficiency. To be sure, there were several recorded instances where UNDP drew escalating management issues to IAEA's attention however the lack of assertive UNDP follow-up eventually contributed to the slow spiral of diminished project delivery and scaled down outputs. In this respect there does not appear to be a single source event which would account for this development but rather a systemic pattern of behaviour where neither agency appreciated the gravity of project management risk that was developing and not taking timely and effective steps to mitigate and reverse these developments.

2.11 Replication Approach

The Nubian project represents one of GEF's initial attempts to develop mechanisms and approaches for the cooperative management of transboundary/shared aquifer resources. The Project Document states that the project will draw on lessons from other GEF transboundary groundwater projects in the region with the expectation that the resulting lessons from this NSAS project would benefit efforts to manage other transboundary aquifers.

In this context, it was expected that efforts would be made to cooperate and share information with other transboundary water initiatives in the region (Nile, Iullemeden, NW Sahara etc.) This was in part to be assured through the involvement of organizations that are actively engaged in these other initiatives (UNESCO, FAO, OSS, etc.) The project was to also seek cooperation with the UNDP Train/Sea/Coast programme and in particular serve as a pilot activity for their

new Training Module on TDA/SAP development. The project was also to establish cooperation with IW Learn and explore possibilities to develop learning tools for groundwater management. Finally, the project was to be presented and discussed at regional fora like the biannual Arab Water Conference as well as at relevant national water resource management related meetings.

There is evidence the Nubian project benefited from the aforementioned UNDP Train/Sea/Coast programme to the extent that TDA/SAP training materials were provided to the project during a TDA/SADA workshop/meeting in Khartoum in 2007. There is also reference to the draft Guarani Aquifer TDA being used during the Nubian TDA/SADA development as well. In addition the Nubian Project Manager visited Libya on 25-27 May 2008 to participate in the Third International Conference on Managing Shared Aquifer Resources in Africa. This conference was organized by the General Water Authority of Libya, the Observatoire du Sahara et du Sahel (OSS) and UNESCO-IHP.

While the Nubian project undoubtedly benefited from these modest encounters there did not appear to be any systemic approach to share such information with other transboundary water initiatives in the region. While there was no specific requirement in the Pro Doc to develop a replication strategy per se, it must be noted that some attempts to exchange information did in fact take place as mentioned in the TDA/SADA meeting reports referred to above.

The replication is rated Moderately **Satisfactory.**

2.12 Risks and risk management

The Pro Doc provides a good outline of the risk categories, their anticipated levels and mitigation measures that might be encountered during the course of the project. These ranged from policy and management risks to risks related to the scientific approach for investigation, assessment and for ensuring the direct usefulness of technical work as a basis for effective and affordable management of the NSAS. It was recommended such risks be addressed via a two-fold project focus:

- Policy/management approach: strategic planning and commitment building;
- Scientific approach: technical emphasis on practical approaches, including a focus on modern isotope hydrology techniques as part of a more management-focused data collection and assessment effort.

A detailed breakdown of the risks that could influence the project results were included in the in the form of a half page table containing risk categories, risk levels and mitigation proposals. A review of their content suggests the risks reflect mainly the policy uncertainties related to creating and implementing a joint management framework for the NSAS System by the four countries.

At the ‘scientific’ level, it would appear that the SADA and SAP working groups were successful in remaining focused in their approach and did not appear to suffer from an overemphasis on

any costly studies or obscure data collection. An example of their focused approach was their success in advancing further knowledge about the NSAS and establishing that there was little to no evidence of transboundary pollution risks in the NSAS. Such conclusions would require further study to confirm the same as they would undoubtedly have wide policy sector impact on future management of the NSAS system.

The 'strategic planning and commitment building sector' proved to be a more challenging endeavour as the effort to enhance the status of the Joint Authority and develop a larger framework agreement required a more tighter, collaborative effort with strong project leadership to manage this process. Such risks were foreseen in the Pro Doc. This is an important issue and this evaluation continues to underscore deficiencies in such project leadership together with lack of robust Steering Committee oversight.

In addition the evaluation finds that there did not appear to be sufficient initiative from the JA at the outset to articulate what it needed from the project or where it proposed to be when the project ended. None of this appears in any form of position paper or submission to the Inception meeting (or subsequent SC meetings), leaving the participating agencies to grapple with an elusive and somewhat nebulous objective of 'enhancement' to which they had all agreed. From a legal perspective it would have been much more preferable had the project been tasked to conduct a functional analysis of the JA to determine whether it has the necessary mandate and resources to fulfil the somewhat exalted management role of the NSAS for which it is being groomed. The resultant findings would have been much more useful in determining what political interventions are necessary to 'enhance' the JA to the status to which it aspires. Regrettably neither the Inception meeting nor the two Steering Committee meetings were able to redact this issue to a series of specific activities where the JA would be a willing participant in its own analysis.

The resultant activities undertaken in Component 3 focused instead on the preparation of legal overviews and identifying individual challenges faced by the participating countries in developing their own IWRM approaches to water management. Whereas the value of this as an incremental approach should not be underestimated, the countries should nonetheless retain a clear focus and leverage their national legal studies to lobby for a reassessment of the capacity of the JA itself. The NSAS deserves to be managed in a form and manner commensurate with the importance the aquifer has in the region in all of its sector usage. As a result it is recommended that leadership and management skills for senior officials, especially in the JA, be a field for future focus and should remain a priority in future Nubian SAP implementation.

The Risks and Risk management approach is rated **Moderately Satisfactory.**

2.13 Financial Planning and Co-financing

The Project was supported by two major institutional sources; the GEF and IAEA. Financial and in-kind contributions from UNESCO and national funding from the NSAS states; Chad, Egypt Sudan and Libya were intended to match and exceed the GEF funding for this Project. The procurement/disbursement process was handled by the IAEA and is fully subject to audit. In

addition the project budget obtained significant relief during revisions at the Inception Phase with PSC agreement to focus not on the development of a Convention as stipulated in the Pro Doc but simply to provide enhanced support to the existing institutional Joint Authority for the NSAS.

Although the main financial streams committed by participating agencies did not all begin to flow immediately at project commencement, the IAEA was fortunate to be able to adapt to the circumstances and was able to coherently organize early project activities from its own co-financing sources. More significant problems were encountered later in the project when project delivery slowed down considerably to the point where no-cost extensions were considered. By the end of 2011 there were significant unspent GEF funds remaining in the project with GEF in a position to receive an as yet undetermined refund estimated to be in the range of $360,000 USD (source 2011 APR).

In addition there was a general consensus that National in kind co-financing was both necessary and generous and contributed significantly to the implementation of various project activities. In addition there was the anticipated cash/in kind contribution from UNESCO however it wasn't clear to the Evaluator how this contribution was eventually made and calculated.

A breakdown of the project sources of financing as taken from the Pro Doc and the last APR appears below. It shows the original project budget and project status as of June 30, 2011.

Sources of Financing	**Budget at ProDoc USD**	**Final Budget USD**
GEF	1,000,000	1,000,000
Governments of NSAS basin	6,283,100	6,283,100
IAEA	618,000	807,926
UNESCO	50,000	50,000
Total	**7,951,100**	**8,141,026**

The financial planning and co-financing is rated **Moderately Satisfactory**.

3. Findings: Results and Impacts

3.1 Attainment of Objectives

The normal departure point for an evaluation of achieved project results is the LFA in the Pro Doc. However, as has been discussed earlier, the Nubian Pro Doc did not contain a pre-existing LFA and attempted to express some of this content in the section dealing with Monitoring and Evaluation (M & E Plan).

The Nubian M & E Plan did provide a suite of pre-agreed general, process, stress reduction and environmental status indicators on the achievement of the overall and immediate project objectives. However these mostly focused on the development of the SADA and SAP were of limited use to the project as a whole.

The project Inception Report would normally confirm or amend the LFA however a review of the Nubian IR shows that the meeting did not discuss the subject of an LFA and focused instead on developing a project implementation plan with merely a linear time frame for attaining project activities.

The next guide as to the whereabouts of relevant LFA information would be in the annual series of APRs. A review of the 2009-11 APRs to which the Evaluator had access did provide some useful benchmarks however these fell well short of the type of indicators normally associated with a properly developed LFA.

Accordingly this evaluation used a multiplicity of sources to gauge project results and relied upon a combination of documents including the M & E Plan, the APRs and self- assessments provided during the evaluation. The information gleaned from these sources was supplemented and corroborated through consultations by email and telephone discussions.

The Pro Doc describes the Overall Objective of the Project as the "*Rational and Equitable Management of the NSAS Towards Sustainable Socio-economic Development and the Protection of Biodiversity and Land Resources".*

This became the departure point for defining the four Immediate Objectives which in their expanded form read as follows:

i. Prepare and agree on a Shared Aquifer Diagnostic Analysis (SADA) to jointly identify, understand and reach agreement on the priority issues, threats and root causes of the NSAS;

ii. Address and fill key methodological, data and capacity gaps needed for strategic planning decisions, using appropriate technical approaches with a focus on isotopic techniques and applications under the supervision of the International Atomic Energy Agency (IAEA);

iii. Undertake the preparation of a Strategic Action Programme (SAP) to outline the necessary legal, policy and institutional reforms needed to address the priority threats and their root causes as identified in the SADA for the NSAS with a focus on the environmental aspects of aquifer management;

iv. Establish a framework for developing an agreed legal and institutional mechanism towards a NSAS convention for joint four-partite management and rational use of the shared NSAS System.

Efforts to achieve the four objectives under this MSP were to involve the implementation of activities under Five Components as follows:

Component 1: Preparation of Shared Aquifer Diagnostic Analysis (SADA) and Addressing Gaps in Capacity and Data

Component 2: Preparation of a Strategic Action Programme (SAP)

Component 3: Establishment of a Framework for developing the Legal and Institutional Mechanism/ - Convention for the NSAS

Component 4: Project Management

Component 5: Project Monitoring and Evaluation

Component 1: Preparation of Shared Aquifer Diagnostic Analysis and addressing gaps In Capacity And Data

This component was to essentially try to achieve objective 1, which is to *prepare and agree on a Shared Aquifer Diagnostic Analysis (SADA) to jointly identify, understand and reach agreement on the priority issues, threats and root causes of the NSAS* through the preparation of the SADA and objective 2, *Address and begin filling key methodological, data and capacity gaps needed for strategic planning decisions, using appropriate technical approaches with a focus on isotopic techniques and applications under the supervision of the International Atomic Energy Agency (IAEA) through addressing gaps in capacity and data*. The component was to be structured so that efforts to fill in data gaps would be initiated early in the project to feed into the TDA process to the degree possible in the time frame.

The ***Outcome*** of this component would be an agreement reached on a SADA and a better understanding of the priority issues, threats and root causes of the NSAS.

The Pro Doc contains an exhaustive list of activities/outputs expected from the successful completion of this component. The development of the SADA remained faithful to this list and followed well-defined procedures established by GEF for conducting transboundary diagnostic analyses. The basic elements were training for national counterparts in GEF methods and establishing planning documents for key components of the SADA report (causal chain, governance, and stakeholder analyses). Unique to this project was the collaborative development of a regional groundwater model to provide a technical basis for evaluating transboundary risks. As a final activity, national SADA meetings were held to discuss issues of national concern in a stakeholder forum.

The development of the groundwater model deserves special mention owing to the collaborative and interactive exercise involving national program coordinators and technical staff from the four countries in the region. An internationally recognized expert in hydrogeological modelling led the modelling team and was assisted by a hydrogeological modeller from the region. Modelling concepts were introduced at a regional workshop attended by participants from all countries. The model itself was developed over a five-month period in Vienna in 2009, which included the participation of all NSAS countries in three regional workshops at various stages in the model development.

The objective of the modelling effort was to produce a regional model of the aquifer which would

have the capability to predict the extent of drawdown, or decrease in aquifer level, due to abstraction.

This objective was designed to meet the needs of the SADA component of this project by anticipating the transboundary effects of abstraction under a variety of future development scenarios. An additional criterion was for the model to be useful in the SAP phase of the project and beyond as a tool for member countries to evaluate the effects on the aquifer of alternative development scenarios as they work through the adaptive management of the shared aquifer.

A review of relevant project outputs indicates that the Nubian modelling study confirmed that the risk of transboundary declines in aquifer levels is low, however there is sufficient uncertainty in the model caused by the lack of hydrological data in the region thereby necessitating that the countries continue and intensify such data collection in the future.

Perhaps the single greatest benefit realized by the SADA was the recognition that the immediate, direct transboundary threat of water-level declines due to cross border extraction are lower than originally thought. This has inspired a variety of related benefits including the recognition that water management strategies can be directed toward preventing rather than mitigating both transboundary and national water management problems.

The satisfactory completion of the SADA was universally acknowledged by all relevant officials interviewed in the project. Moreover the SADA findings served as an excellent platform for the next stage in the project being the development of the Strategic Action Programme (SAP).

The successful completion of Component #1 and attainment of Project Objective #1 and #2 is rated as **Satisfactory**.

Component 2: Preparation of a Strategic Action Programme (SAP)

This component was to achieve Objective 3, which is to *undertake the preparation of a Strategic Action Programme (SAP) to outline the necessary legal, policy and institutional reforms needed to address the priority threats and their root causes as identified in the SADA for the NSAS with a focus on the environmental aspects of aquifer management.*

As such the SAP was to provide a regional vision for the NSAS and propose the means to achieve this goal through objectives, management actions and targets. Toward this end the NSAS had already established that the Joint Authority would co-ordinate the activities of the countries and the Nubian SAP fully supported this role. From the review of interim reports it can be established that the SAP was developed through the extensive use of national working groups in each country which prepared their respective National Reports and identified priority national actions that were later consolidated into the Nubian SAP.

To assist reaching the SAP vision for the NSAS there were three overarching water resources and ecosystem quality objectives which were agreed upon:

Water Resource / Ecosystem Objective 1: To manage the shared aquifer in a sustainable and equitable way for the benefit of the NSAS countries on the basis of joint regional planning in order to minimise negative effects within and between countries, anticipating the challenges including increasing population, needs of agricultural expansion, and climate change.

a. To strengthen the role and capacity of the Joint Authority to effectively manage the shared aquifer.

b. To achieve water-efficient use priorities and activities and to reduce the negative impacts of anthropogenic activities on groundwater regime, levels, and quality.

c. To enhance the NSAS resilience to adapt to climate change impacts.

Water Resource / Ecosystem Objective 2: To mainstream environmental aspects in the integrated management of the NSAS to conserve the dependent ecosystems and reduce the risk of loss/damage to biodiversity.

Water Resource / Ecosystem Objective 3: To utilize the Nubian aquifer resources on a sustainable socio-economic development basis.

a. To enable integrated transboundary and national socio-economic development activities in the NSAS region, such as implementing appropriate agricultural, industrial and municipal practices to protect the water resources and allow growth.

b. To manage the aquifer and its ecosystems in such a way as to reduce threat from human migrations and associated detrimental effects.

The SAP identified over one hundred management activities, actions and targets to strengthen the regional and national capacities of the countries to achieve the objectives and the vision for the NSAS. Moreover there was an extensive Monitoring and Evaluation section for SAP Implementation developed as well. Key specific Process, Stress and Environmental Indicators were prepared together with an outline of “next steps” for going forward. It is anticipated that the majority of these management actions will take place under the co-ordination of the Joint Authority and with the expected full co-operation between national institutes and the responsible government authorities.

The Nubian SAP has now been agreed upon at the technical level. Still required is the all important government endorsement in each country together with the need to further develop a more detailed understanding of the costs and benefits of the management actions outlined in the SAP. This in turn will enable the identification of gaps and the need to secure additional funding. In addition it will be necessary for the four countries to develop corresponding National Action Plans that reflect the regional goals and objectives in the NSAS. Once again it is expressed that should be done under the close supervision and co-ordination of the Joint Authority.

In summary, the Nubian SAP appears to be an effective document which can serve as a major and significant step in the preparation of a more substantive SAP along traditional GEF requirements. This SAP was produced during some of the most difficult times of the project during which there were lengthy pauses in implementation activities and political turmoil in the region. In form and substance it more closely resembles a "SAP outline" as it falls short of the SAP envisioned in the logical framework developed during the project. In addition it suffered from the need to meet project closure deadlines and, in the Legal and Institutional component, to better suit the needs of the member states. Nonetheless the SAP provides a fairly detailed road map for further SAP development and implementation. Perhaps its best contribution lies in that it identifies a range of pilot/demonstration activities to be undertaken in one or more countries with the expectation that the results will be shared and used to prepare a more detailed SAP program going forward.

The successful completion of Component #2 and attainment of Project Objective #3 is rated as **Moderately Satisfactory.**

Component 3: Establishment of a Framework for developing the Legal and Institutional Mechanism/ - Convention for the NSAS

The Pro Doc describes this component as supporting the achievement objective 4, *"To establish a framework for developing an agreed legal and institutional mechanism towards a NSAS convention for joint four-partite management and rational use of the shared NSAS System".*

The conceptualization of this component underwent several evolutionary phases since it was first discussed at the project Inception meeting held in Tripoli in the summer of 2006. Even at this early stage it was evident that not all countries had a common vision of what a new Institutional Mechanism and a NSAS convention would entail. Most of the concern centered around the future role of the Joint Authority and its relationship within any new legal mechanism/structure to be designed within the framework of the project.

This issue was revisited and received broader discussion at the First Project Steering Committee / Joint Authority Meeting held in Cairo on December 16-18th, 2007. Once again the countries grappled with the need to develop a regional vision for the NSAS system and the need to conduct an assessment and evaluation of the existing legal framework and legislation in NSAS countries which would not diminish the existing role and status of the Joint Authority. Given the lack of consensus on approach the countries agreed to once again defer commencement activities in this Component pending further consultations with home governments.

Finally in March of 2008 the Joint Authority, at its tenth meeting held in Tripoli, modified the title of Component 3 from “developing” to “enhancing the legal and institutional framework, etc”. Record of this event is found in the Minutes of the Second Project Steering Committee held in Vienna in January of 2009. The minutes of this meeting go on to say that, “ All modifications accepted and approved by IAEA, UNESCO and UNDP”.

Following the March 2008 Joint Authority meeting in Tripoli the project began to make up for lost time by quickly developing TORs for legal experts which resulted in the hiring of two such experts in each country. The activities which followed consisted of the development of a set of four national legal reports and a review of these reports by UNESCO’s lead consultant. The summary of the findings of the national reports and their context in the regional setting were eventually presented at a regional Legal and Institutional meeting held in Vienna in October of 2010. Elements of this summary were later incorporated into the draft Nubian SAP. The meeting also felt that additional work was still needed to synthesize and build upon the national legal reports and that this work should be concluded and presented by UNESCO’s consultant at a final project meeting. As of July 2011 this work had not yet been completed however minutes of the Final Regional SAP meeting held that month continued to reaffirm the importance of this assignment and maintained the expectation that it will be concluded.

In summary it should be noted that there was almost unanimous consensus among all the interviewed participants that this Component was far too ambitious, as originally conceived, for an MSP project this size. The early meetings (Inception and first Steering), all provide ample evidence of the parties struggling to find common ground on the scope of this Component and the degree of political will necessary to move towards developing a convention on the NSAS.

In addition, it was made clear to the evaluator that although UNESCO played a main role in delivering the results for Component 3, there was confusion and differences of opinion between the agencies as to how this component was to be delivered and at what pace. Once again it would appear that institutional communication problems lay at the heart of these delays and undoubtedly led to frustrated expectations between IAEA and UNESCO themselves, and with their country counterparts as well.

The successful completion of Component #3 and attainment of Project Objective #4 is rated as **Moderately Unsatisfactory**.

Component 4: Project Management

The Pro Doc indicates this component would address management issues necessary to support project implementation and hence would support the other components above as well as the four main objectives. The purpose of this component was to manage project implementation efficiently and effectively and also to build institutional capacity, with a focus on strengthening the Joint Authority. The outcome of the component was intended to be a strengthened regional/national coordination mechanism for integrated management and rational use of the NSAS System.

For a review of this component please see the section Management Arrangements previously referred to in 2.5 above.

Component 5: Project Monitoring and Evaluation

The Pro Doc describes this component as essentially an extension of component 4 and an activity that would be one of the major tasks of the PIU Project Manager. The outcome of this component was to be an agreed monitoring and evaluation plan and a subsequent end of project evaluation of project progress and results based on project objectives and performance indicators.

For a review of this component please see the section Monitoring and Evaluation previously referred to in 2.8 above.

3.2 Fact Findings

After the completion of a full range of key interviews, desk reviews, completed questionnaires the Evaluation finds that the project:

- The project successfully completed a SADA and provisional SAP of sufficient quality allowing it to move forward and engage competent donor authorities for sources of further development and implementation funding.
- The project suffered from the combined lack of country agreement to the stationing of a PIU and Project Manager in the field, and from insufficient political will at IAEA and UNDP to make this issue a project 'deal breaker' for the countries.
- Producing a TDA/SAP and addressing legal review aspects in the framework of a MSP (limited time, limited resources) and, in a challenging political environment was too ambitious and too difficult.
- There appeared to be good participation from the countries in the SADA and SAP – although difficult to ascertain how many people were actually involved. Participation from lead 'ministries' and/or key agencies was recognized as being substantial.

- The SADA was successful in clearly identifying the root causes and main issues for the NSAS.

- The Nubian SAP in its current form would be considered an early stage draft by GEF standards. To implement a true SAP there is a need for more 'poof of principles'. The current outline of a SAP recognizes this deficiency by identifying a range of pilot activities to be undertaken in one or more countries with the expectation that such results will be shared and used in the preparation of a more detailed SAP.

- The PSC displayed early adaptive and pragmatic management by recognizing that new supra-institutions were not necessary in the region and that the Nubian MSP should focus on enhancing the role of the Joint Authority.

- The relationship between IAEA and UNESCO on Component 3 was insufficiently clear at the outset of the project as to respective responsibilities, expectations and budget. This was further compounded by mutual failure to address this issue in a timely manner at the outset of the project.

- The SADA identified the complex nature of legal obstacles, vested interests and financial obstacles impeding aquifer management which hinder cooperation in the region.

- Countries need to share data in order to jointly manage shared water resources. Lack of a regional database will minimize future cooperation among countries.

- Proper sampling schedules among countries need to be further enhanced.

- Two recurring problems were associated with the model: sufficient training which was never provided and no 'hand-over' plan of the model was ever developed despite numerous requests from the countries to do so.

- The scientific orientation of the project contributed to a better understanding of the aquifer but did not necessarily lead to further agreement on a cooperation framework which requires more involvement from policy makers than scientists.

- The project contributed to an overall increase in scientific and general understanding of the NSAS in the region.

- Language capacities differed widely among the countries in the region and the project suffered from access to a common language in the project. Insufficient attention was given to accommodate Chad's requirement for more French language materials. More consideration should have been given to exploring the possibility of using Arabic as a universal language of communication within the project and during project activities.

- The project advanced the evolution of the concept of the "NSAS Countries" to that of a more mature, self-assured regional voice.

- The project confirmed IAEA's unique scientific and technical skills in isotope testing and modelling expertise as a basis for further groundwater studies.

- The project website was never developed to be of any value to the participant countries or to the general public.

- The project confirmed UNDP-GEF's vital advocacy role in promoting International Waters projects and acting as a catalyst for wider donor support.

- The project confirmed UNDP-GEF's lead role in providing policy leadership and substantial financial support.

- The time frame of this MSP shows that it was insufficiently long enough to build the necessary confidence among countries needed to sustain cooperation in this politically sensitive region. The project results that were obtained notwithstanding a less than hospitable political environment **speak persuasively to the need for a follow-up project.**

4. Sustainability

At the commencement of the Nubian project there was consensus agreement that the establishment of the Joint Authority for the Nubian Sandstone Aquifer System would lay the foundation for the sustainability of project activities. It was intended that the Joint Authority would be further strengthened during the course of the project and would assure the sustainability of project benefits after the project's completion. Finally it was anticipated that clearly demonstrated benefits would encourage the member countries to provide the modest financial means necessary to sustain a more active and effective Joint Authority.

In addition it was foreseen that sustainability of project activities and post-project implementation would be assured by the continued involvement of key stakeholders during the project activities. Further, public awareness activities, targeted at important stakeholders would ensure the development of broad level support for jointly managing the NSAS. Based on the strong support of the four governments and other stakeholders, it was anticipated that the Nubian project could lay the foundation for a full GEF project to support incremental elements of SAP implementation and/or the support of other donors interested in facilitating cooperative management of shared water resources in Africa.

The Project Document also anticipated a number of risk factors that would influence future sustainability of project achievements. Such risks included the following:

- Possible failure to adequately define jointly planned mining and protection of the non-renewable and unrelated resources of the Nubia aquifer.

- The time-consuming and complex process for the development of a NSAS legal and institutional framework. This work is complicated by current gaps in international groundwater law especially in relation to unrelated and non-renewable groundwater.

- Possible failure to attract high political attention and priority at regional, national and local levels.

The development of the SAP recognized and responded to such risks with a series of recommendations and a list of realistic next steps designed to assure the gains of the Nubian would be sustained. These included:

- Attempt to have the SAP endorsed in the partner countries at the highest political level possible.
- Utilizing the SAP as the basis for a larger SAP implementation project, likely consisting of national demonstration projects which have promise for replication within individual countries and/or regionally.

The emphasis on developing practical demonstrations that can be replicated elsewhere was particularly well discussed in a series of final meetings devoted to SAP approval. This practical approach now provides sufficient detail and direction for the countries to begin designing a mix of projects relating to agricultural and pastoral activities. Monitoring and modeling activities were singled out for particular attention emphasizing the need to focus on a specific location, developing tools that can be used elsewhere and designing well defined outcomes.

The aforementioned approach, if adequately addressed, gives much greater confidence to expect that the Nubian SAP will attract further international attention and much needed additional donor support in the future. Taking into account the strictures of time and project resources the evaluation finds that the issue of sustainability was adequately addressed given the political context within which the Nubian region currently finds itself and the consequent stress this has placed on the functioning of the Joint Authority.

The overall sustainability of project outcomes is rated as **Moderately Satisfactory.**

5. Lessons Learned

There are many lessons that can be drawn from the above assessments and while most are specific to the project at hand there are others which may have a broader generic value which may be applicable to other ground water projects. A list of some of the more important lessons learned from this MSP are as follows:

1. Clear, focused project management is essential and frequent communication between executing and implementing agencies is necessary to keep the project on track.

2. A project that involves four countries is a sufficiently complex project that requires a full time dedicated project manager and preferably located in the region in one of the participating countries.

3. There is a greater need for better consultations with countries at the design stage of a project to identify potential contentious issues and ensure that participating countries are aware of the implications a given draft MSP will have on the treatment of such issues in the project.

4. The importance of a sound scientific basis, including knowledge of transboundary issues (if any) as a basis for building cooperation and any enhancing of legal and institutional basis.

5. IAEA's aquifer model proved to be an open, transparent and agreed-upon platform on which to analyze aquifer data and model it. The process of developing the model for the Nubian served as a useful instrument to bring the partner countries together and compelled everyone to discuss and agree upon the terms of analysis of the data. This successful approach is recommended for similar groundwater projects.

6. There is still a need to consider the appropriate application of the TDA/SAP methodology to groundwater.

7. GEF best practices would suggest that the TDA/SAP should be seen as an iterative process consisting of a 'preliminary' analysis with a draft SAP which is refined with practical inputs from Demonstration projects.

8. Unlike transboundary river commissions It is not clear what a transboundary groundwater institution should look like. No definitive model exists and the Nubian MSP proved to be a pioneering effort.

9. Developing regional frameworks for the management of shared water resources normally takes a long time to be achieved. Expecting that a cooperation framework could be achieved in three years of negotiations was an overly optimistic target.

10. Scientific approaches can minimize management conflicts among countries sharing water resource aquifers.

11. International cooperation which fosters transparency between the four NSAS countries creates trust and willingness for greater cooperation in the future.

12. Continuous capacity building is essential to ensure sustainability of efficient management of shared resources.

13. Cross border cooperation among technical people can help create the necessary enabling environment for policy makers to make political decisions for the collective benefit of all citizens in the affected countries.

14. The role of international agencies as mentoring agents in the NSAS region is mutually beneficial to all concerned.

15. The Nubian MSP confirmed the need for more adaptive and flexible financial procedures when administering and implementing activities in complex and diverse field conditions.

6. Recommendations

- Having project management deployed in the region is extremely critical and future SAP development and/or implementation should be conditional on NSAS countries agreeing to base a future PIU and project manager in the region.
- It is recommended that leadership and management skills for senior officials, especially in the JA be included in future SAP implementation activities.
- Continued regional instability needs to be balanced against the risk of significant momentum loss if follow-on activities are delayed indefinitely.
- Particular attention needs to be paid to language issues in the region with sufficient budget allocations needed for more translations of project outputs and activities into Arabic and French.
- The Nubian SAP provides a fairly detailed road map for further SAP enhancement and eventual implementation. It is recommended that countries seek to obtain early political support to enhance the SAP in order to undertake the full range of pilot activities leading to a better policy document for country endorsement.
- Without a follow-on project for SAP implementation there may not be sufficient motivation on the part of the NSAS countries to continue project efforts in a cohesive way. Much assistance is still required to enhance the Joint Authority as it appears to have ceased activity after the CEDARE project was concluded and only revived when the present Nubian MSP was announced.
- Given the potential cost benefit involved there is sufficient justification to warrant including a Mid-Term evaluation for all MSP projects.

7. Assessment Summary and Ratings

CRITERION	SUMMARY COMMENTS	RATING
PROJECT FORMULATION		
Project concept and design	The Nubian project was designed in conformity with the priorities stated for the GEF International Waters (IW) Focal Area. Its drawbacks were lay in the over ambitious objectives and outcomes expected for an MSP of this size.	**Moderately Satisfactory (MS)**
PROJECT IMPLEMENTATION		
Project Governance	The governance and management structure of the Nubian MSP was both ambiguous and convoluted. Institutional strengths and weaknesses of some of the key agencies were not well aligned.	**Unsatisfactory (U)**

CRITERION	SUMMARY COMMENTS	RATING
Project Implementation and Management	There appeared to be a systemic inability by the NSAS countries and the IAEA to recognize the risks resulting from failure to host the PIU and Project Manager in the region.	**Unsatisfactory (U)**
Country ownership/drivenness	The Evaluator finds that there was a moderately high level of country ownership in the Nubian MSP which has its rationale, both in the institutional arrangements that were enhanced and also the in considerable number of SADA and SAP activities which mobilized a wide spectrum of technical resources and personnel.	**Satisfactory (S)**
Implementation Approach		
Stakeholder participation in implementation	The involvement of key stakeholder groups in the Nubian MSP was made that much easier owing to IAEA's considerable experience in the region. Involvement of NGOs and civil society was modest as such concepts are still relatively new in the region.	**Moderaely Satisfactory (MS)**
Risk management	At the 'scientific' level, it would appear that the SADA and SAP working groups were adaptive and successful in remaining focused in their approach throughout the project. The 'policy/management' approach required a more tighter, collaborative effort with strong project management and oversight to guide this process.	**Moderately Satisfactory (MS)**
Project finances		
Co-financing	Adequate co-financing was available however there were numerous deficiencies in actual financial management and planning .	**Moderately Satisfactory (MS)**
Cost-effectiveness	Redesigning Outputs in the initial stage of the project and focusing available resources on developing the key outputs of a SADA and SAP made project more cost effective though less productive.	**Moderately Satisfactory (MS)**
Monitoring and Evaluation		
M&E Arrangements	A modest number of monitoring modalities were utilized in the project. The absence of adequate project oversight and lack of regular SC meetings had a distinct negative impact on the project.	**Moderately Unsatisfactory (MU)**

CRITERION	SUMMARY COMMENTS	RATING
SUSTAINABILITY		
Overall Sustainability	Issues of sustainability were adequately addressed given the political context within which the Nubian region currently finds itself and the consequent stress this has placed on the functioning of the Joint Authority.	**Moderately Satisfactory (S)**
Replication Communication	While there was no specific requirement in the Pro Doc to develop a replication strategy per se, some attempts to exchange information did in fact take place as mentioned in several TDA/SADA meeting reports.	**Moderately Satisfactory (S)**
PROJECT RESULTS : Attainment of Objectives with reference to the Indicators		
Objective 1: Prepare and agree on a Shared Aquifer Diagnostic Analysis (SADA) to jointly identify, understand and reach agreement on the priority issues, threats and root causes of the NSAS;	Agreement reached on a SADA and a better understanding of the priority issues, threats and root causes of the NSAS.	**Satisfactory (S)**
Objective 2: Address and fill key methodological, data and capacity gaps needed for strategic planning decisions, using appropriate technical approaches with a focus on isotopic techniques and applications under the supervision of the International Atomic Energy Agency (IAEA);	Comprehensive training, field work, isotope testing and modelling exercises conducted resulting in contribution to increased knowledge base and capacity building in the NSAS.	**Satisfactory (S)**
Objective 3:. Undertake the preparation of a Strategic Action Programme (SAP) to outline the necessary legal, policy and institutional reforms needed to address the priority threats and their root causes as identified in the SADA for the NSAS with a focus on the environmental aspects of aquifer management;	The SAP is now an effective document for the preparation of a more substantive SAP along traditional GEF requirements. This SAP was produced during some of the most difficult times of the project during which there were lengthy pauses in implementation activities and political turmoil in the region. Nonetheless the SAP provides a fairly detailed road map for further SAP development and is especially valuable for its identification of a proposed range of demonstration activities which will be useful in preparing a more detailed SAP program going forward.	**Moderately Satisfactory (MS)**

CRITERION	SUMMARY COMMENTS	RATING
Objective 4: Establish a framework for "enhancing" an agreed legal and institutional mechanism towards a NSAS convention for joint four-partite management and rational use of the shared NSAS System.	The conceptualization of this component underwent several evolutionary phases and was significantly delayed in its implementation. The resultant activities focused on the preparation of legal overviews and identifying individual challenges faced by the participating countries in developing their own IWRM approaches to water management. As an incremental delivery they remain a valuable contribution. The overall delivery of this component was substantially constrained by the lack of inter-agency communication, elusive management and over ambitious design and delivery targets.	**Moderately Unsatisfactory (MU)**
OVERALL PROJECT RATING		**Moderately Satisfactory (MS)**

Annex 1

EVALUATION REPORT: SAMPLE OUTLINE
Minimum GEF requirements[1]

Executive summary
- Brief description of project
- Context and purpose of the evaluation
- Main conclusions, recommendations and lessons learned

Introduction
- Purpose of the evaluation
- Key issues addressed
- Methodology of the evaluation
- Structure of the evaluation

The project(s) and its development context
- Project start and its duration
- Problems that the project seek to address
- Immediate and development objectives of the project
- Main stakeholders
- Results expected

Findings and Conclusions
(In addition to a descriptive assessment, all criteria marked with (*) should be rated[2])

- **Project formulation**
  - Implementation approach (*)(i)
  - Analysis of LFA (Project logic /strategy; Indicators)
  - Lessons from other relevant projects (e.g., same focal area) incorporated into project implementation
  - Country ownership/Driveness
  - Stakeholder participation (*)
  - Replication approach
  - Cost-effectiveness
  - UNDP comparative advantage
  - Linkages between project and other interventions within the sector
  - Management arrangements

- **Implementation**
  - Implementation approach (*)(ii)
  - The logical framework used during implementation as a management and M&E tool
  - Effective partnerships arrangements established for implementation of the project with relevant stakeholders involved in the country/region

[1] Please refer to GEF guidelines for explanation of Terminology
[2] The ratings will be: Highly Satisfactory, Satisfactory, Marginally Satisfactory, Unsatisfactory

- Feedback from M&E activities used for adaptive management
- Financial Planning
- Monitoring and evaluation (*)
- Execution and implementation modalities
- Management by the UNDP country office
- Coordination and operational issues

- **Results**
  - Attainment of objectives (*)
  - Sustainability (*)
  - Contribution to upgrading skills of the national staff

Recommendations

- Corrective actions for the design, implementation, monitoring and evaluation of the project
- Actions to follow up or reinforce initial benefits from the project
- Proposals for future directions underlining main objectives

Lessons learned

- Best and worst practices in addressing issues relating to relevance, performance and success

Annexes

- TOR
- Itinerary
- List of persons interviewed
- Summary of field visits
- List of documents reviewed
- Questionnaire used and summary of results

Annex 2 List of documents reviewed and consulted

1. Nubian MSP Project Document
2. Report of Inception Meeting July 16-20, 2006 - Tripoli, Libya
3. First SC Meeting minutes, December 16-18, 2007 – Cairo, Egypt
4. Second SC Meeting minutes, January 26-27, 2009 – Vienna, Austria
5. Chad report May 2010
6. SADA Report, September 2010
7. Draft SAP Report, June 2011
8. Minutes Final Regional SAP meeting July 25-26, 2011
9. Chad Legal and Institutional Report, 2009
10. Libya Legal Regulation of Water, 2010
11. Egypt Legal and Institutional Report, 2010
12. Sudan Legal and Institutional report, 2009
13. Technical baseline meeting 2006
14. SADA/SAP training course report 2007
15. Modelling meeting report 2007
16. Stakeholder Analysis 2008
17. Causal Chain Analysis 2008
18. Nubian Governance Analysis 2008
19. Project annual progress report 2009
20. Project APR/PIR report 2007
21. Project APR/PIR report 2008
22. Project APR/PIR report 2009
23. Project APR/PIR report 2010

Websites;

http://www-naweb.iaea.org/napc/ih/IHS_projects_nubian.html

ftp://napc-nap:sUPh4w4d@ftp.iaea.org

Annex 3 List of persons interviewed/questionnaires reviewed

	Name	Organization / Institution / Position
1	Pradeep Kumar Aggarwal	IAEA Programme Manager (Water Resources) Lead TO
2	Vladimir Mamaev	GEF Regional Technical Advisor, UNDP Europe and the CIS
3	Eric Cole	IAEA Department of Technical Cooperation Project Management Officer
4	Spyridon Kleitsas	IAEA Technical Officer – Project Analyst
5	Raya Stephan	UNESCO IHP Legal framework consultant
6	Katarina Hadad	UNDP Programme Associate Bratislava Regional Centre (BRE)
7	Andy Garner	IAEA NAPC
8	Mohamed Bayoumi	Egypt UNDP Country Office
9	Osman Mustafa Ahmed	Sudan NPC Groundwater and Wadis Directorate
10	Abd Alla Mohammed Kheir	Sudan Ministry of Irrigation and Water Resources
11	Lutfi Ali Madi	Libya Executive Director JASAD
12	Ismail Musa	Chad NPC
13	Adoum Acyl Mahadjir	Chad
14	Nahed El Arabi	Egypt Director Research Institute for Groundwater
15	Sameh Afifi	Egypt Research Institute for Groundwater
16	Akram Fikry	Egypt Research Institute for Groundwater
17	Mirey Atalah	UNDP Environment Finance Group (BRE)
18	Paul Gremillion	Independent Consultant SADA
19	Peter Whalley	Independent Consultant SAP
20	Martin Bloxham	Independent Consultant