English & Arabic

English	Arabic
Appropriate resources: Resources that contribute to the sustainability of project outcomes. Appropriate resources are locally available, environmentally sound, low cost, culturally acceptable, technologically appropriate	**الموارد الملائمة:** المصادر التي تساهم في استدامه نتائج المشروع. الموارد الملائمة تكون متاحة محليا ، سليمة بيئياً منخفضة التكلفة ، ومقبولة حضارياً ، وذات تكنولوجيا ملائمةً
Beneficiary: A person or group whose lives the project plans to improve in some way	**المستفيد:** اي شخص او مجموعه يخطط المشروع لتحسين حياتهم بشكل او بآخر.
Budget: A budget is a plan of itemised project expenses that helps allocate resources	**الميزانية:** الميزانية هي خطه بند مصروفات المشروع التى تساعد على تخصيص الموارد.
Concept note: The project concept note describes the ideas about what can be done within a specified period of time, to deal with a particular problem or situation; a situation that requires more time and resources than is normally available to an organization. In other words, the project concept note represents a collective vision of those directly involved in planning the project, and describes the rationale, goals, objectives, activities, and expected outcomes of the project	**مفهوم المذكرة:** مفهوم مذكرة المشروع يصف الأفكار حول ما يمكن القيام به خلال فتره زمنيه محددة ، التعامل مع المشكلة او الموقف لوضع يتطلب عادة مزيداً من الوقت وموارد أكثر من المتاح. وبعبارة أخري ، فان مفهوم المشروع يمثل رؤية جماعية للمتداخلين مباشره في تخطيط المشروع ، ويصف الاسباب والغايات والاهداف والانشطه والنتائج المتوقعة من المشروع
Deliverables: See Outputs	**المسلمات:** أنظر النتائج
Evaluation: Evaluation is a planned, systematic process that assesses an achievement by preset criteria. Evaluation determines to what extent the achievements (results, impacts, outputs, outcomes) are comparable with the original intended purposes, and what lessons can be learned for the next planning and management cycle	**التقييم:** التقييم عملية مخططة ومنظمة لتقييم انجازاً بناء على مجموعة من المعايير. التقييم يحدد مدي الانجازات (المتحصلات ، الآثار ، المخرجات ، والنتائج) المقصودة ، وما هي الدروس التي يمكن استخلاصها للتخطيط المقبل ودورة الإدارة

Executing agency: An organization that carries out a project with the support of other organizations or governments. (See also implementing agency)	**الهيئة المنفذة:** المنظمة التى تنفذ المشروع بمساعده منظمات اخري او حكومات. (انظر ايضا الهيئة المطبقة)
Gantt chart: A Gantt chart is a visual project design and management tool which lists all project tasks and their relationship to time. Designing a Gantt chart helps you to analyse, schedule and monitor tasks, and allocate resources on time and efficiently. Henry Gantt (1861-1919) was an American engineer who invented and used this simple technique for the first time which has been used ever since under his name by all managers and planners	**مخطط غانت:** مخطط وأداة تصميم وإدارة المشروع يتضمن جميع المهام وعلاقتها بالوقت. غانت مخطط يساعد على تحليل جدول المهام ، ومتابعه ورصد الموارد في الوقت المناسب وبكفاءه. هنري غانت (1861-1919) مهندس أميركى مخترع هذه التقنية البسيطة المستخدمة تحت اسمه من قبل جميع المديرين والمخططين
Goal: The goal describes in broad terms what the project hopes to achieve. In other words, it describes how the situation will change as a result of your project being implemented	**الغاية:** توصف الغاية بعبارة عامه عن ما يأمل المشروع فى تحقيقه. وبعبارة أخري تصف كيفية تغيير الوضع نتيجة أن المشروع قيد التنفيذ
Impact: Impact is a significant and direct influence. Project impact generally describes effects that will continue beyond the timeframe of the project or beyond the region where the project is situated, and refers to the broader development, research or policy implications that result from the project. Consider the following questions: How might the project influence policy formulation and implementation? How might it impact development processes at the local, national and regional levels? How might it affect the sustainability of the local economy over the longer term? Could the results be used in other settings? What contribution could they make to existing technical and scientific knowledge?	**الأثر:** تأثير كبير ومباشر. اثر المشاريع عموما يصف الاثار التي ستظل خارج الاطار الزمني للمشروع او خارج المنطقه التي يقع المشروع ، وتشير إلى زيادة التطوير والبحوث والسياسات العامة الناشئة عن المشروع. بحث الأسئلة التالية : كيف يمكن ان يؤثر المشروع فى صياغة وتنفيذ السياسات؟ كيف يمكن ان يؤثر في عمليات التنميه المحليه والوطنيه والاقليميه؟ كيف يمكن ان يؤثر علي استدامة الاقتصاد المحلي علي المدي الطويل؟ هل يمكن استخدام النتائج في مواقع اخري؟ اي اسهام يمكن ان تقدمه التقنية والمعرفة العلمية؟
Implementing agency: An organization that carries out a project with the support of other organizations or governments. (See also executing agency)	**الهيئة المطبقة:** المنظمة التى تنفذ المشروع بمساعده منظمات اخري او حكومات. (انظر ايضا الهيئة المنفذة)

Indicator: A measure that can be used to determine the performance of functions, processes, and outcomes over time. It should be easy to measure, practical and sensitive to the smallest changes of performances	**المؤشر**: المقياس الذي يمكن ان يستخدم في تحديد اداء المهام والعمليات والنتائج علي مر الزمن. وينبغي ان يكون سهل القياس وحساس لأدنى تغيير فى الأداء
In-kind contribution: This term generally refers to a financial contribution to a project made by the project proponents, partners, or stakeholders	**مساهمة عينية**: ويشير هذا المصطلح عموما الي المساهمه ماليا في المشروع المقدم من مؤيدي المشروع والشركاء ، او اصحاب المصالح
Input: See 'Resource'	**المدخلات**: انظر 'المصدر'
Lead partner: See 'Project proponent'	**شريك رئيسي**: أنظر 'أنصار المشروع'
Logical Framework Approach (LFA): The Logical Framework Approach is an objective-oriented project planning method to help those who want to prepare and implement projects in planning, assessment, follow-up and evaluation of projects in order to ensure good and long lasting results	**نهج الاطار المنطقي:** نهج الإطار المنطقي هو نظام التخطيط بالأهداف لتصميم المشروعات يساعد الذين يرغبون في اعداد وتنفيذ مشاريع في مجالات تخطيط وتقييم ومتابعة المشاريع من أجل ضمان جودة ودوام النتائج
Methodology: The methodology section describes how your project will be planned and implemented in order to achieve your goals and objectives. It includes the strategies, activities, and timelines for the project. This section also describes what will be done, by whom, and when	**المنهجية:** المنهجية قسم يصف كيفية تخطيط وتصميم المشروع من أجل أن يحقق أهدافه ومقاصده. وتشمل الاستراتيجيات والانشطه ، والجداول الزمنيه للمشروع. يصف هذا الجزء ايضا ما ينبغي عمله من قبل من ومتي
Milestones: A milestone is a scheduled significant time or event in a project when certain activities are completed, their outputs are delivered	**المعالم**: المعلم هو محدد المدة الزمنية المناسبة أوحدث بالمشروع عند الانتهاء من بعض الأنشطة والنواتج المقدمة.

Monitoring: Monitoring is a planned, systematic process that closely follows a process and compares the actual values with the expected ones. Monitoring the GEO process makes sure the environmental assessment reaches its intended purposes within the scope of allocated resources (time, financial, human, informational, technical etc.)	**الرصد:** الرصد هو عملية مخططة ومنظمة لمتابعة ومقارنة القيم الفعلية بالمتوقعة. عمليه الرصد الجغرافي تضمن وصول التقييم البيئى للأغراض المقصودة في نطاق الموارد المخصصة (زمنية ومالية وبشرية وتقنيه وإعلامية الخ)
Objective: Objectives describe the benefits of the project in specific, measurable terms. Project objectives should be able to be assessed, even if not all of them lend themselves to quantitative analysis. They are generally associated with project 'outputs,' i.e. 'to train 8500 forestry workers in appropriate management practices in riparian areas'	**الهدف:** الأهداف تصف فوائد المشروع المحددة القابلة للقياس. اهداف المشروع يجب ان تكون قابلة للتقييم ، حتى لو ليست كلها تصلح للتحليل الكمي. عاده ما تكون المشاريع مرتبطة 'بالمخرجات' مثلاً '' لتدريب 8500 من العاملين في الغابات بممارسات الإدارة الملائمة في المناطق الساحليه'
Outputs: The outputs are the short-term, or immediate results of the project	**المخرجات:** والمخرجات هى نتائج المشروع قصيرة المدى
Outcome: The outcome of the project addresses broadly how the situation or problem will change as a result of project implementation. The outcome of the project is therefore reflected in the project goal	**النتيجة:** نتائج المشروع توضح كيفية تغير الوضع أو المشكلة نتيجة تنفيذ المشروع. نتائج المشروع تنعكس فى الغاية
Parallel task: A parallel task does not depend on the completion of other tasks within a certain period of the project. E.g. creating a website to communicate results	**مهمة بالتوازي:** وهى المهمة التى لا تتوقف علي انجاز المهام الاخري خلال فتره زمنيه معينه في المشروع. مثلا انشاء شبكه لإتصال النتائج
Participatory development: An approach that maintains that improving the social, economic and environmental situation must entail active involvement and decision making on the part of those most directly affected by the initiative	**التنمية القائمة علي المشاركه:** نهج يري ان تحسين الحالة الاجتماعية والاقتصادية والبيئية يجب ان تتضمن المشاركة وصنع القرار من جانب البلدان الاكثر تضررا من هذه المبادره

Partners: Those organizations that have direct accountability for planning and implementing the project. Unlike a legal or business partnership, the cooperative arrangement to participate in a joint project normally lasts on a formal basis only for the duration of the project.	**الشركاء:** تلك المنظمات التي لها المسؤولية المباشرة عن تخطيط وتنفيذ المشروع. خلاف الشراكة القانونية والأعمال التعاونية في مشروع مشترك تستمر عاده علي اساس رسمي فقط خلال مدة المشروع
Primary contact: Staff members in one's own organization, professional colleagues, agencies.	**الاتصال الأولي**: الموظفين بمنظمة مملوكة ، الزملاء المتخصصين والوكالات
Project: A project can be defined as an initiative to achieve specific goals that are related to, but go beyond, the normal mandate of an organization or institution, and require additional resources beyond the usual capacity of the organization or institution. A project is designed to meet an identified need. The word 'project' comes from Latin: *projectum* **'** something thrown forth, **'** from *pro-* **'**forward**'** + combining form of *iacere* (pp. *iactus*) **'**to throw**'**	**المشروع:** المشروع يمكن ان يعرف كمبادرة لتحقيق أهداف محدده ذات صله ، وتتجاوز القدرة البشرية العادية لأية منظمة أو مؤسسة ، وتتطلب موارد اضافيه تتجاوز قدرة المنظمة أو المؤسسة العادية. المشروع يهدف الي تلبية الأحتياجات المحدده. كلمه 'المشروع' تاتي من اللاتينية : بروجيكتوم' ما ألقى الي الامام '+ الجمع شكل ياسيري (ياكتوس) 'رمي'
Project Cycle: The project cycle covers the life of a project from identification of needs and priorities until the completion of work and evaluation of results. Main steps include: project identification, preparation, appraisal/negotiation, implementation and follow-up and evaluation	**دوره المشروع:** دوره المشروع تتناول حياه المشروع من تحديد الاحتياجات والاولويات حتي الانتهاء من العمل وتقييم النتائج. الخطوات الرئيسية في المشروع : تحديد المشاريع وتقييمها والإعداد والتفاوض والتنفيذ والمتابعه والتقييم
Project design: A planning process that defines the key elements and structure of a project	**تصميم المشروع**: عمليه التخطيط التى قد تحدد العناصر الأساسية وتشكيل المشروع

Project implementation: This refers directly to project activities. These would typically include non-administrative activities of staff or consultants that deal with the substance of the project, training for staff or participants involved in the project, research, and production of resource materials or reports	**تنفيذ المشروع:** هذه اشاره مباشره إلى أنشطة المشروع. وتشمل أنشطة غير إدارية للموظفين أو الاستشاريين المتعاملين مع جوهر المشروع ، تدريب الموظفين والمشاركين في هذا المشروع ، البحوث ، وإنتاج المواد المرجعية او التقارير
Project management: This refers to all aspects of management and administration associated with coordinating the project. It typically includes staff time and communications for meetings with project team members and other stakeholders about project management issues, accounting and record keeping, and travel related to project management	**اداره المشاريع:** وينطبق هذا علي جميع الجوانب التنظيميه والاداريه المرتبطه لتنسيق المشروع. وعاده ما يتضمن وقت الموظفين والاتصالات لعقد اجتماعات مع اعضاء فريق عمل المشروع والمعنيين الآخرين بشان قضايا اداره المشاريع والمحاسبه ومسك الدفاتر والسفر المتعلقة بإدارة المشروع
Project proponents: Those who are directly involved in making plans and in actively supporting and implementing the project. A person or group that puts forward a proposal	**أنصار المشروع:** يشاركون مشاركه مباشره في وضع الخطط ودعم المشروع وتنفيذه. اي شخص او جماعه تقدم مقترح
Project proposal: A document that describes the details of a potential project, including the outcomes, outputs, major risks, costs, stakeholders and an estimate of the resources and time required. Project proposals are often solicited by a formal Request for Proposals (RFP) by donor agencies, private clients	**المشروع المقترح**: وثيقة تصف تفاصيل المشروع المحتملة ، بما في ذلك نتائج المخرجات الرئيسية والمخاطر والتكاليف والمعنيين وتقدير الوقت والموارد المطلوبة. مقترحات المشاريع تطلب طلبًا رسمياً من قبل الوكالات المانحة أو العملاء
Rationale: The rationale section of a project proposal outlines why the project is an appropriate way of addressing the issue, and why the project is suitable given the available resources	**المنطق**: يتضمن القسم المنطقي الخطوط العريضة لاقتراح المشروع وأسباب مناسبة المشروع لمعالجة موضوع ما ، ولماذا هذا المشروع مناسب نظرا للموارد المتاحة
Resource: Resource is anything – not only money and material - that is needed to reach the project objectives. Resources are also referred to as 'inputs'.	**المورد:** المصدر اي شيء ليس فقط المال أو المواد لتحقيق أهداف المشروع. يشار للمصادر أيضاً بالمدخلات .

Responsibility Matrix. When a project entails a number of partners and stakeholders, it is sometimes useful to prepare a responsibility matrix that outlines who is responsible for implementing specific categories of activities, who is kept informed, who will advise, and the timeline for all of these. An example of a responsibility matrix can be found in the tools section of this course	**مصفوفة المسئولية:** عندما المشروع يتضمن عددا من الاطراف والجهات المعنيه ، يكون في بعض الأحيان من المفيد أعداد مصفوفة المسئولية التي تحدد من هو المسئول عن تنفيذ فئات محددة من الأنشطة ، من يعلم ، من يقدم المشورة والزمن لكل منها. مثال مصفوفة المسئولية يمكن العثور عليها في قسم أدوات هذه الدورة
Responsibility: A duty, a course of action demanded and entrusted by other members of the project	**المسئولية**: واجب لإجراء المطلوب والمعهود من الاعضاء الاخرين في المشروع
Role: A role in a project can be defined as a function, a position which has characteristic behaviour	**الدور:** يعرف الدور في المشروع بالوظيفة ، وهو عمل له سلوك مميز
Secondary contact: An individual or organization recommended by primary contacts	**الاتصال الثانوى:** الفرد أو المنظمة التي أوصي بها الإتصال الأولى
Sector: A distinct category of society characterised by its particular role and relationship with society and the economy. For example, government is part of the public sector; corporations are usually part of the private sector.	**القطاع**: فئة متميزة في المجتمع مميزة بدور محدد وعلاقتها بالمجتمع والاقتصاد. فعلي سبيل المثال ، ان الحكومه جزء من القطاع العام. والشركات عادة جزء من القطاع الخاص
Sequential task: A sequential task that depends on the completion of another task. For example you can not start proof-reading a document before you complete the narrative	**المهمة المتسلسلة:** وهى المهمة التي تتوقف علي انجاز اي مهمه اخري. فعلي سبيل المثال لا يمكنكم البدء في تصحيح وثيقة قبل اكتمال السرد
'SMART' objective: Objective which is specific (S), measurable (M), achievable (A), realistic (R) and time-bound (T)	**الهدف الذكى:** هدف محدد ، يمكن قياسه ، واقعى ، ومحدد زمنيا

Stakeholders: Those who have an interest in the project, because they will be directly or indirectly involved in it, or because they will be affected by it. They have a 'stake' or an investment in the process and the outcome	**المعنيين:** من لهم مصلحه في المشروع ، سواء مباشرة أو غير مباشره ، أو لأنهم سيتأثرون به. لهم منفعة أو الإستثمار في هذه العمليه ونتائجها
Strategies: Strategies provide a broad picture of what will be done to achieve goals, and generally include the main organizational approaches required for both programme management and programme implementation	**الاستراتيجيات:** الإستراتيجيات تقديم صوره عامه لما يمكن عمله لتحقيق اهداف عامه ، وتشمل الطرق الرئيسية التنظيمية اللازمة لإدارة وتنفيذ البرامج
Sustainability: The capacity to continue operations with the resources available after project funding has ended	**الاستدامة:** القدرة علي مواصله العمليات بالموارد المتاحة بعد إنتهاء تمويل المشروع
'SWOT' analysis: An analytical planning and management tool which lists the project's (or organization's, individual's) internal strengths (S), weaknesses (W), as well as explores the external opportunities (O) and threats (T)	**تحليل (سوت)**: أداة تخطيط وإدارة تحليلية تعرض القوه الداخلية للمشروع (او المنظمة ، والفرد) ونقاط الضعف وكذلك بحث الفرص الخارجية ، والتهديدات
Synergy: The increased capacity for action resulting from the combined efforts of individuals or groups with complementary skills and resources, achieving more together than could be done separately.	**التعاون**: ازدياد القدرة علي العمل نتيجه تضافر جهود الافراد او الجماعات مكمله بالمهارات والموارد ، تحقيق المزيد كمجموعة عن ما يمكن عمله علي حده
Task: Tasks are specific actions that need to be undertaken to achieve objectives	**المهمة:** المهام هى إجراءات محددة التي يتعين القيام بها لتحقيق الأهداف
Win-win situation: A situation in which two or more groups each meet their own distinct interests through collaboration or conflict resolution	**وضع التوفيق**: حاله وجود فئتان أو أكثر تلبى مصالح مشتركة عن طريق التعاون وفض المنازعات

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IFPRI Virtual Learning Room – Free online courses (e.g. How to write a convincing proposal?)
http://learning.ifpri.org/

International Development Research Centre, Canada
www.idrc.ca

International Institute for Environment and Development, UK
http://www.iied.org/

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World Bank Global Small and Medium Enterprise Programme Application Guidelines
www.worldbank.org

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Case Study - Lake Manzala, Egypt

Improving Lake Manzala's Water Quality through Lake Manzala Engineered Wetland

1. Basic information

1.1. Basic information about the proposed project

Project Title	**Improving Lake Manzala's Water Quality through Lake Manzala Engineered Wetland**					
Project Acronym (abbreviation)	LMEWP					
TIMEFRAME	START	1-1-2006	END	31-12-2007	DURATION	24 month

1.2 Information about project proponent / lead partner organization

Organization Name:	Drainage Research Institute	
Address:	Delta Barrage , Cairo, Egypt	
Date established:	1975	
Hours of operation:	9 a.m. to 3 p.m.	
Website:		
Name and title of contact:	Prof. Hussam Fahmy	
Phone: (202) 2189383	**Fax:** (202) 2189153	**Email:** dri@dri-eg.org

2. Project Description and Summary

This project, being implemented by the Egyptian Environmental Affairs Agency, is demonstrating an approach to achieving sustainable development while addressing deteriorating water quality in Lake Manzala. The project will empower local residents and build the capacity of nongovernmental organizations and government institutions to achieve Egyptian self-sufficiency in an innovative technology. The project's specific objectives include:

(a) promote sustainable development by enhancing environmental and economic opportunities at the local and national levels

(b) construct and operate a demonstration wetland that will treat 25 000 to 50 000 cubic meters of wastewater per day before entering Lake Manzala

Lake Manzala is located on the North-Eastern edge of the Nile Delta. The lake discharges to the Mediterranean Sea west of Port Said and the Suez Canal. The Lake is exposed to pollutants from industrial, domestic, and agricultural sources. Five major drains carry irrigation return flows to the lake. Bahr El Baqar Drain is the largest and most polluted of the five drains, it travels 150 kilometres from Cairo to Lake Manzala and drains approximately 270 000 hectares. The average flow of approximately three million cubic meters per day carries particulates, nutrients, metals, organics and toxic compounds from spent irrigation waters, municipal and industrial discharge, and non-point sources of pollution.

Pollutant inflows to Lake Manzala have severely impacted the lake and threaten the Mediterranean Sea. Efforts to protect the lake include improved wastewater treatment of municipal and industrial point sources, primarily in Cairo. In addition, alternatives have been considered for directly treating polluted drain water before it enters the lake. The Lake Manzala Engineered Wetland Project creates artificial transitional zones between terrestrial and aquatic systems. They trap sediments and pollutants, cycle

nutrients, and reuse treated water in agriculture. Engineered wetlands are anticipated to provide an economically and environmentally sound alternative to traditional wastewater treatment facilities.

The Egyptian Environment Affairs Agency (EEAA) has initiated the design and construction of a 20 hectares engineered wetland, operated in year 2001. The Global Environmental Facility / United National Development Program (GEF/UNDP) funds the project, with a main objective of treating 25 000 m^3 per day of the polluted drainage water as a demonstration for low cost technique for wastewater treatment to protect the ecology of Lake Manzala and Mediterranean Sea.

Site description

Lake Manzala, the largest of Egypt's Mediterranean wetlands and the most productive for fisheries, is located in the north-eastern corner of the Nile delta. Manzala is generally rectangular in shape, about 60 km long and 40 km wide, and has an average depth of 1.3 m. It is separated from the Mediterranean Sea by a sandbar, through which it is connected to the sea by three channels (bughaz).

The salinity in the lake varies greatly; while it is low near drain and canal outflows in the south and west, it is high in the extreme north-west. Brackish conditions predominate over much of the remainder of the lake. Over 1 000 islands of varying sizes are scattered throughout the lake.

The three main habitats are reed-swamps, saltmarshes and sandy areas. The reed-swamps of *Phragmites* and *Typha*, with associated submerged water-plants (e.g. *Potamogeton* and *Najas*), are found extensively in the less saline portions of the lake in the south and west and fringing many islands. Saltmarshes of *Juncus* and *Halocnemum* occur on the northern (coastal) margins of the lakes and some islands. Sand formations are occupied by several plant communities, e.g. coastal dunes. Open water and mudflats are also important habitats for birds. Large areas in the north-west of the lake have been turned into fish-farms, while much of the southern part of the site (south of 31°10″ N) has been divided into large plots and drained, in preparation for its conversion to agricultural use.

A total of 3.7 km^3 of fresh water (mostly from agricultural drainage) flow annually into Lake Manzala from nine major drains and canals. The most important of these are Faraskur, Al Sarw, Baghous, Abu Garida and Bahr El Baqar. Of all the drains discharging into Lake Manzala, Bahr El Baqar drain is the most polluted. It carries a mixture of treated and untreated waste-water originating from Cairo and contributing much to the deteriorating water quality of the lake. Bughaz El Gamil is the main connection between the lake and the Mediterranean. Several other less important sea connections have recently been enlarged.[10]

Activities

1.Capacity building

This component will increase capability for sustainable development in managing Lake Manzala, including local and national participation. This involves activities to:

(a) strengthen and promote community involvement in environmental management activities
(b) build capacity and develop human resources to ensure that the engineered wetland can be operated and replicated on a regional scale
(c) disseminate lessons and experiences of the project at global, national, and community levels

[10] BirdLife International 2005 *BirdLife's online World Bird Database: the site for bird conservation.* Version 2.0. Cambridge, UK: BirdLife International. Available: http://www.birdlife.org (Accessed 11 June 2006)

2.Engineered wetland technology

This component will demonstrate a low-cost, efficient method of treating large bodies of water in Egypt and promoting a cleaner Mediterranean Sea. This will involve:

(a) completing preconstruction planning and activities
(b) constructing the demonstration wetland treatment system, sediment pond, engineered wetlands, and aquaculture facility
(c) implementing innovative wetland technology
(d) establishing a monitoring and evaluation system to enable the Egyptian Environmental Affairs Agency to maintain the wetlands' expected performance levels

In addition, biomass will be harvested and processed into marketable products. The clean effluent water will be used for an aquaculture facility to produce juvenile fish stock for the lake and other aquaculture ventures.

Benefits

1. Reduce pollution flowing into Lake Manzala and the Mediterranean Sea, protect diversity and enhance habitats of fish, bird, and other aquatic species Reduce emissions of greenhouse gases from anoxic drain water.
2. Improve economic well-being and health of local residents Strengthen local and national institutions in project delivery and implementation
3. Demonstrate sustainable, low-cost alternative to traditional waste treatment and increase environmental awareness of local citizens.[11]

SEVEN STEPS

STEP 1: Identify, State and Clarify the Problem:

The water quality of Lake Manzala is poor. The polluted water threatens:
(1) Health - causing diarrhoea, hepatitis, kidney failure and other water born diseases (e.g. malaria)
(2) Economy – due to (a) Absence of high value fish varieties with lake water sweetening
(b) Sedimentation which makes fishing difficult for large fishing boats
(c) Weakened livestock which is threatened by contaminated drinking water
(3) Habitats – resulting in losing ecosystem services and the international status of being 'Important Bird Area'
(4) Mediterranean Sea - as Lake Manzala communicates with the Mediterranean Sea

STEP 2: Analyze the Problem by Gathering Facts and Information:

The pollution is directly related to the incoming drainage water discharging mixed industrial, communal and agricultural contaminants into the lake.

Five major drains carry irrigation return flows to the lake. The Bahr El Baqar Drain is the largest and most polluted one. It travels 150 kilometres from Cairo to Lake Manzala and drains approximately 270 000 hectares, including Cairo. The average flow is approximately three million cubic meters per day.

[11] IW LEARN: International Waters Learning Exchange and Resource Network:
http://www.iwlearn.net/iw-projects/Fsp_112799468063/view?searchterm=None (Accessed 11 June 2006)

The water carries particulates, nutrients, metals, organics and toxic compounds from used irrigation waters, municipal and industrial discharge, and non-point sources of pollution. In addition, the local communities living on the five big and several smaller islands in the lake generate further pollution.

STEP 3: Develop Alternative Solutions:

Efforts to improve Lake Manzala's water quality included:

1. Improving the current wastewater treatment of municipal and industrial point sources, primarily in Cairo
2. Treating the polluted drain water directly before it enters the lake
3. Creating an engineered wetland with artificial transitional zones between terrestrial and aquatic systems which could trap sediments and pollutants, cycle nutrients, and reuse treated water in agriculture

1. Improving the current treatment process and installing new facilities

To further improve wastewater treatment of municipal and industrial point sources, primarily in Cairo would require improving the current treatment process and installing new facilities which are resource intensive and very expensive large scale investments.

However, even if the improvement of current facilities and the installation of new ones had been implemented satisfactorily, the pollution of Lake Manzala would still persist because of the small villages disposing raw sewage directly to the drains connected with the Lake. Moreover, hundreds of scattered houses along the drain-banks would also continue contributing to non-point pollutions.

2. Direct treatment of the polluted drain water before it enters the lake

For this solution, we need to consider that treating polluted water is much more effective and economic when the treatment takes place as close as possible to its source rather than being far away, a long distance down the drain.

In addition, this solution would also require finding appropriate treatment technologies that could cope with mixed (domestic, agriculture and industrial) pollutant loads. Separating different types of pollutant is the key of selecting treatment facility at a reduced cost. Mixing more than one pollution type also means increasing treatment cost.

3. Engineered wetland

Having studied other engineered wetlands, it is anticipated that this solution could provide an economically and environmentally sound alternative to traditional wastewater treatment facilities (e.g. items 1 & 2).

Other similar engineered wetland projects studied for sewage treatment in Egypt are:

1. Abu Atwa, Ismailia Governorate - Constructed wetland
2. Samaha village (12 000) – Subsurface wetland with alum application and sand filtering

Benefits of engineered wetlands:

1. The treated water may be reused in agriculture production and aquaculture
2. Harvested vegetations from the wetland – e.g. reed, cattail - may be recycled through bio-gas production or as fodder when environmentally safe

STEP 4: Select the Best Solution:

The Egyptian Environment Affairs Agency has selected the engineered wetland as the best solution based on the following:

- The reduced treatment cost compared with the high costs of conventional treatment options
- The availability of lands for wetland constructions (donated from government)
- Flexibility of wetlands for treating mixed wastewater which can not be achieved through conventional treatment techniques
- The model value of replacing high cost, difficult-to-operate sophisticated conventional treatment systems with more low or no maintenance natural systems, i.e. wetlands

STEP 5: Design a Plan of Action:

The Egyptian Environmental Affairs Agency (EEAA) has translated the engineered wetland idea into a project with the following goals:

- To improve the health conditions of communities living around Lake Manzala
- To provide a non-conventional water source for fishing, irrigation, and raising livestock
- To protect the Mediterranean Sea through improving the Lake Manzala water quality

EEAA has approached the Global Environmental Facility / United National Development Program (GEF/UNDP) for funding to construct a wetland that could treat 25 000 m^3 per day of polluted drainage water as a demonstration of low cost technique for wastewater treatment to protect Lake Manzala and the Mediterranean Sea.

STEP 6: Implement the Solution:

GEF has provided funding to construct the engineered wetland. An Environmental Impact Assessment (EIA) study was conducted prior to the project implementation

The construction included the following infrastructures:

- Pump station with screw pumps.
- Two sedimentation ponds - 1.5 m depth
- Ten free water surface cells (250x50x0.5 m) for secondary treatment.
- Two reciprocating gravel bed cells for tertiary treatment.
- Two fingerling ponds
- Four fish farms for fish production
- Two drying beds for pond dredging sediments

STEP 7: Evaluate the implemented solution:

To evaluate LMEWP a follow-up performance evaluation project was initiated by NWRI with the same project partners and stakeholders as above.

The performance evaluation project had two major goals:

1. To assess the feasibility of wetland treatment systems for improving drain water quality, public health, and the aquatic ecology of Lake Manzala
2. To assist the transfer of wetland treatment technology to other parts of Egypt

A performance evaluation included a research project with the following objectives:

- To carry out a sensitivity analysis for a computer model - PREWet - to find out what major parameters affect the wetland's capacity of treating pollutants
- To compare the computer model results with field results
- To study the applicability of the PREWet model to estimate pollutant removals for constructed wetland design purposes

3. Functions of the Proposal

3.1. Project background

Egypt is making tremendous efforts to conserve water through increasing water use efficiency and the reuse of low quality water in irrigation. The recycling of water seems to provide a great opportunity for obtaining additional water resources. One of the potentially recycled water sources is treated municipal and industrial wastewater. Treated wastewater of appropriate and consistent quality is essential for irrigation to protect the environment and human health and to provide predictable crop growth. The treated wastewater quality could be controlled through the treatment techniques.

Lake Manzala Engineered Wetland Project **(**LMEWP) main objective is to introduce wetland technology through a demonstration project. This technology has been successful for several years in developed countries. The project should treat 25 000 cubic meters per day of the heavily polluted water of Bahr El Baqar drain. The full scale project would generally improve the lake-drain water quality, and all related environmental and health conditions. It would also promote sustainable development through enhancing environmental and economic opportunities at the local and national levels.

The main targets of the project can be summarised as follow:

1. Lake Manzala Water Quality Improvement
2. Treating a part of Bahr El Baqar Drain Water
3. Introducing new and economic Wastewater Treatment Systems

Evaluation of the performance of the LMEWP as a low cost treatment technology to improve polluted drainage water quality before dumping to the lake is a very important step before its replication in different locations specially, near village as a low cost treatment technology.

3.2. Project rationale

Arid countries - such as Egypt and other Middle East countries - are facing a water scarcity crisis. The crisis requires these countries to optimize the use of all available water resources**.** The reuse of drainage water is becoming an increasingly important water source in Egypt. However, large quantities of water in the drainage network can not be used as the water is polluted. Constructed wetlands, however, could be used to treat the polluted water as wetlands trap sediments and pollutants, cycle nutrients, and reuse treated water in agriculture.

3.3. Overall project goals

- To protect the Mediterranean Sea through improving the Lake Manzala water quality
- To provide a non conventional water source to fulfil different requirements such as fishing and irrigation
- To improve the health conditions of communities living around Lake Manzala

3.4. Project objectives

The full scale project would generally improve the lake-drain water quality, and all related environmental and health conditions. It would also promote sustainable development through enhancing environmental and economic opportunities at the local and national levels.

The main goals of the project can be summarised as follow:

1. Lake Manzala Water Quality Improvement
2. Treating Bahr El Baqar Drain Water
3. Introducing new Wastewater Treatment Systems

3.5. Project impacts

The project's intended impacts include:

1. Improved water quality of Lake Manzala and consequently the Mediterranean Sea
2. Enhanced environmental and economic opportunities at the local and national level
3. Development of a transferable model of wetland treatment technology to other parts of Egypt
4. Safe and clean fish fingerling for safe fish production to replace the risky polluted fish currently produced from the Lake area.

4. Staffing and Organizational Information

4.1 Project proponents and partners

1. National Water Research Centre through Drainage Research Institute and Central Laboratory for Environmental Quality Monitoring CLEQM
2. Ministry of Environmental Affairs through EEAA

4.2. Project stakeholders

1. Ministries (Ministry of Water Resources and Irrigation MWRI, Ministry Of Environmental Affairs MOEA, Ministry Of Health MOH), MWRI is concentrated on treated drainage water reuse in irrigation as a water saving strategy. MOEA is interested in the protection of Northern Lakes, the environment of the drains as well as conservation of Lake Manzala. MOH fights water born dieses and works on reducing the infection with malaria
2. Farmers and fishers
3. NGOs NGO's helps in establishment of water user associations and crops – fish marketing, public awareness and future operation of similar projects
4. Universities for scientific research in water soil, flora and fauna, socio-economic and operation and maintenance manuals

5. Project Methodology

5.1. Work Packages

Work Package No	Work Package title	Responsible Partner	Involved Partners
WP1	Project Administration and follow up	DRI	
WP2	Field activities	DRI	CLEQM
WP3	Reporting activities	DRI	CLEQM
WP4	Research Activities	NWRC	Universities
WP5	Establishment of Constructed operational guidelines	NWRC	CLEQM
WP6	Egyptian Wetland initialization	NWRC	EEAA
WP7	Finance management	NWRC	

Plan of Activities

Work-package No	Action No	Start (mm/yy)	End (mm/yy)	Description of activities, components, means	Responsible Partner	Involved Partners	Location	Expected output / deliverables
WP1	1	1/2006	1/2006	Project action plan (project activities, time frame, resources, equipments, regulatory requirements....;;	DRI	CLEQM	DRI (Cairo)	Project action plan
	N	2/2006	2/2006	Designing the monitoring plan				Monitoring plan
WP2	1	1/2006	4/2006	Preparing filed lab	CLEQM			Prepared filed lab
	2	5/2006	10/2007	Field trips for sampling (water, sediments, plants, fish) according to the monitoring plan	DRI	CLEQM	Project area	Samples collection
	3	5/2006	10/2007	Samples analysis	CLEQM		CLEQM Lab.	Samples analysis results
	4	5/2006	10/2007	Field analysis	DRI	CLEQM	Project area	Analysis results
WP3	1	5/2006	10/2007	Data interpretation and statistical analysis	DRI		DRI (Cairo)	Data Interpretation
	2	2/2006	12/2007	Monthly Report	DRI		DRI (Cairo)	Reports
WP4	1	5/2006	12/2007	Water quality ,Agronomy, Hydraulic, And other topics could be studied	NWRC			Research results
	2							

5.2. Timetable

Year	2006												2007												2008											
Months	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec
No months (1,2,3,...) *																																				
Work Package 1																																				
- Action 1.1	→																																			
- Action 1.n		→																																		
Work Package 2																																				
- Action 2.1	—	—	→																																	
- Action 2.2					—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	→													
Action 2.3					—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	→													
Action 2.4					—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	→													
Work Package 3																																				
- Action 3.1					—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	→										
- Action 3.2		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	→										
Work Package 4																																				
- Action 4.1																																				
- Action 4.n																																				
Work Package 5					—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	→										
- Action 5.1																																				
- Action 5.n																																				
Work Package 6																																				
- Action 6.1																																				
- Action 6.n																																				

6. Project Management

Results

The following infrastructures, physical outputs were developed as a result of the project:

- Pump station with screw pumps
- Two sedimentation ponds - 1.5 m depth
- Ten free water surface cells (250*50*0.5 m) for secondary treatment
- Two reciprocating gravel bed cells for tertiary treatment
- Two fingerling ponds
- Four fish farms for fish production
- Two drying beds for pond dredging sediments
- Complete construction of the wetland treatment system
- Implementation of innovative wetland technology

Other results related to capacity building and follow up are as follows:

- Strengthening community involvement in environmental management
- Developing the personnel capabilities to ensure optimum wetland operation
- Experiences dissemination at global, national, and community levels
- Establishing the wetlands monitoring and evaluation system

7. Project Outcomes

- Improving Lake Manzala water quality and thus protecting the Mediterranean Sea water
- Providing a non conventional water source
- Improving the health conditions of communities living around Lake Manzala

8. Monitoring and Evaluation

Project monitoring activities	**Indicators used**	**Responsibility**	**Dates**
Operation of the system	Number of Problems	Field manager	On going activity
Setting appropriate water quality sampling frequencies	Appropriate Frequency	management	3/2006, 12/200
Sampling and lab. Analysis of water quality parameters	Values of the analysed parameters	Field staff Lab. staff	On going activity
Project evaluation activities	**Indicators used**	**Responsibility**	**Dates**
Assessing the system performance	Treated water quality	Project Management	monthly

9. Project Budget

9.1. Project costs per items and partner (in Euro)

Partner	Personnel	Meeting, conferences, seminars	Travel and accommodations	Promotion and publication	External expertise and audit	Equipment materials and rents	Operational costs	Others	Total
DRI	100,000	50,000	100,000	50,000	50,000	200,000		100,000	800,000
CLEQM	80,000	50,000	100,000	50,000	50,000	200,000	50,000	50,000	600,000
EEAA	100,000	50,000	50,000	50,000	50,000	50,000	50,000		400,000
Total	280,000	150,000	250,000	150,000	150,000	450,000	100,000	150,000	1,800,000

9.2. Project costs per year and partner (in Euro)

Partner	2006			2007			Total (Euro)
	Donor contribution	Other sources	Total	Donor contribution	Other sources	Total	
DRI	300,000	100,000	400,000	300,000	100,000	400,000	800,000
CLEQM	200,000	100,000	300,000	200,000	100,000	300,000	600,000
EEAA	100,000	50,000	150,000	100,000	50,000	150,000	300,000

Project Proposal

Environmental Management of Floating Fish Cages within Nile Branches, Egypt

1. Basic information

1.1. Basic information about the proposed project

Project Title	Environmental Management of Floating Fish Cages within Nile Branches					
Project Acronym (abbreviation)						
TIMEFRAME	START	1-1-2006	END	31-12-2006	DURATION	12 month

1.2. Information about project proponent / lead partner organization

Organization Name:	Environment and Climate Research Institute	
Address:	Delta Barrage.P.O. Box 13621, Kalyiobia, Egypt	
Date established:	1998	
Hours of operation:	8 hours/day	
Website:		
Name and title of primary contact:	Prof. Laila M. Abed**,** Director	
Phone:020-2182070	**Fax:**020-2182070	**Email:** Icre@ Maktoob
Name and title of additional contact	Mohamed Abedl-Meguid	
Phone:020-2184757	**Fax:**020-218-2182070	**Email:** Abdel_Meguid@Maktoob

2. Project overview or summary

In Egypt, the fish culture is an old activity and it remained in lowest general interest as long as captive fisheries provided a ready supply of fish in an adequate way. However, with the increase of the human population in the last 60 years, and the resulting increasing pressure on the natural resources, fish farming has received more attention; especially that fish is considered as the cheapest animal protein to the Egyptian populace.

Currently, fish farming in Egypt ranges from the traditional village type ponds and hosha systems, to modern governmental and private fish farm. With the modern technologies, fish can be raised in earthen ponds, concrete ponds, or above-ground PVC or steel tanks. Also, integrated agri-aquaculture systems over conventional farming systems have been used to increase the farm productivity and profitability without any net increase in water consumption. Moreover production of fish in floating cages has been established in the Nile River and its branches because it is simple technology and does not need additional water economically feasible under Egyptian conditions. In both Rosetta and Damitta branches there are many legal and illegal floating fish cages. There are benefits of such culture including increases in farm productivity and profitability without any net increase in water consumption. However there is much concern about an environmental hazard if discharged pollutants to water. This negative impact is based on the assumption that can be summarized as follows:

1. Toxic substances, either naturally present or added to the feed (components) before, during

or after processing or regenerated within the feed by decomposition during its storage may be toxic to other organisms including plants and the human

2. Aquaculture drainage water may contain residues of hormones, pesticides, herbicides, antibiotics or chemical compounds associated with fish treatments; can cause serious problems to the ecosystem and the human health
3. Bad operation of the floating fish farm associated with over stocking of fish in the cages may cause negative impacts on the water quality
4. Nutrients in the effluent waters from floating fish cages are primarily derived from feed waste (fines/dust and feed not eaten by fish), and excreted and faecal wastes. Usually, such nutrients discharged are in form of NH_4. However, during the process of equilibrium if NH_3 exceeds to certain level it may toxic to the human and other organisms

3. Functions of the Proposal

3.1. Project context or background to the issues/problem

1 Environmental concerns
2 Complains to decisions makers
3 Conflicts among water beneficiaries
4 Fish farming is a very important component for the Egyptian economy
5 Nile water quality threats

3.2. Project rationale

Floating fish cages are considered the main source for fish protein within their areas as well as neighbouring communities. However, the in-correct implementation of these cages caused lots of environmental threats to these areas. Therefore, accurate and comprehensive assessment of these cages is considered a very essential basic step towards improving their management. Thereafter, and based on various stakeholders' consultations, guidelines for management these cages can be performed based on scientific, realistic, and socio-economic investigations. This methodology with the mentioned sequence ensures the applicability and technical sound of the final product (guidelines).

3.3. Project impact

Improve the quality of life.

3.4. Overall project goal

Management of floating fish cages within Nile branches without causing any negative environmental impacts.

3.5. Project objectives

1 Improve the hydraulic efficiency
2 Improve the water quality status
3 Increase fish productivity and animal protein
4 Improve socio-economic status
5 Reduce water born disease
6 Increase public awareness
7 Involvement of different stakeholders in conflicts resolution

4. Staffing and Organizational Information

4.1. Information about the project proponents and partners

1. Institution : Environment and Climate Research Institute

Name of Project Leader : Prof. Laila M. Abed**,** Director

Postal Address: Delta Barrage.P.O. Box 13621, Kalyiobia, Egypt

Email : eacri@idsc1.gov.eg
Type of Institution : Research

2. Institution : Strategic Research Unit

Name of principal Investigator : Prof. Dr. Nahla Aboul-Fotoh, Director

Postal Address: Delta Barrage.P.O. Box 13621, Kalyiobia, Egypt
Type of Institution : Research

3. Institution : Central Laboratory for Environmental Quality Monitoring

Name of principal Investigator : Prof. Tarik A. Tawfic, Director

Postal Address: Delta Barrage.P.O. Box 13621, Kalyiobia, Egypt

Type of Institution : Research

4.2. Information about the project stakeholders

The project will create the necessary co-ordination mechanisms to develop implementation with seven stakeholders involved as the following:

1 Fish farmers
2 Fishermen
3 Neighbouring community
4 Local authority for drinking water
5 MWRI
6 Ministry of Health
7 Youth

5. Project Methodology

5.1. Work Packages

Work Package No	Work Package title	Responsible Partner	Involved Partners involved
WP1	Collecting the most recent data and papers concerning the floating fish cages.	**(ECRI)**	
WP2	Field data collection	**(ECRI)**	
WP3	Data analysis	**(CLEQM**)	
WP4	Writing the reports	**(ECRI)**	**(CLEQM**)
WP5	Environment assessment for the current situation.	**(SRU)**	
WP6	Implementing participatory strategy to create consultation environment for information sharing.	**(SRU)**	
WP7	Develop Guidelines for managing floating fish cages.	**(SRU)**	**(ECRI)**
WP8	Guidelines Report	**(SRU)**	**(ECRI) (CLEQM**)

Plan of Activities

Work-package No	Action No	Start (mm/yy)	End (mm/yy)	Description of activities, components, means	Responsible Partner	Involved Partners	Location	Expected output / deliverables
WP1	1			Collecting background data information from different sources such as library, net, authorities	**(ECRI)**		Local and international	Get more reliable data
	1			Collecting water and hydrosoil samples	**(ECRI)**		Rossetta and Damitta Branches	
	2			Collecting biological samples such as planktons, fish and benthic organism	**(ECRI)**		Rossetta and Damitta Branches	
	3			Measuring the hydraulic efficiency	**(ECRI)**		Rossetta and Damitta Branches	
	4			Determine the aquatic weed infestation	**(ECRI**)		Rossetta and Damitta Branches	
	1			Determine the water quality parameters such as, temperature, turbidity, pH, dissolved oxygen, electrical conductance, total dissolved solids, major nutrients (ammonia, and orthophosphates), all major cations (Ca^{+2}, Mg^{+2}, Na^{+} and K^{+}), anions (Cl^{-}, NO_2^{-}, SO_4^{-2}, $HCO_3^{-}$and CO_3^{2-}), total suspended and volatile solids, chemical oxygen demand, oil and grease and Heavy metals.	**(CLEQM**)		(CLEQM)	
	2			Determine Total Coliform (TC) and Fecal Coliform (FC) as well as the phytoplankton and zooplankton densities for surface water samples will be determined.	**(CLEQM**)		(CLEQM)	

	3			Determine Biacumulation of pollutant within the tissue of fish will be measured.	**(CLEQM**)		(CLEQM	
	4			Determine the quality of the sediment will be considered during the field investigation (Mechanically and chemically).	**(CLEQM**)		(CLEQM	
WP4	1			Writing the preliminary and final reports about data analyses	**(ECRI)**	**(CLEQM**) **(SRU)**	The main building of Research Center	
WP5	1			Assessment of the current environmental status of the fish cages	(SRU)	(ECRI)		
	2			Writing the assessment report	(SRU)		The main building of Research Center	
	1			Development of Participatory strategy	(SRU)		The main building of Research Center	
	2			Implementing Strategy through workshops, field meetings	(SRU)		Rossetta and Damitta Branches	
WP7	1			Carry out consultation meetings with various stakeholders	(SRU)		Rossetta and Damitta Branches	
	2			Develop Guidelines	(SRU)		The main building of Research Center	
WP8	1			Writing guidelines report	(SRU)	(ECRI)	The main building of Research Center	

6. Project results

Activities	Expected Results	Performance Indicators	Critical Conditions (Assumptions and Risks)
Raw data	Report	Existence of report	Field campaign goes smooth on time, problems for data collection
Assessment	Assessment report	Existence of report	Reliable data, data error produce wrong assessment
Implementing participatory strategy	Report, meeting, workshop	Documentations for participatory work	stakeholders are motivated the need of stakeholders unsatisfied
Guidelines for managing	Report, guidelines	Existing guideline report	Acceptance of the guideline Unacceptable guideline

6.1. Project Outcomes

1 Planning and managing floating fish cage activities for the benefit of the Egyptian communities who are welling to improve the water quality, fish productivity and increase the animal protein to the Egyptian populace
2 Efficient use of water resources in the best way from a socio-economic and environmental point of view
3 Create mechanisms to develop implementation with all stakeholder involved within the Nile River to improve QoL

7. Monitoring and Evaluation

Project monitoring activities	Indicators used	Responsibility	Dates
Data collection	Papers and reports	researchers	Previous data
Field data collection	reports	expertise	Recent data

8. Project Budget

8.1. Project costs

Total budget resources required for the project duration are **81 500** Euro.

8.1.1. Project costs per items and partner (in Euro)

	Personnel	Meeting, conferences, seminars	Travels, accommodation	Promotion, publication	Equipment	Operational costs	Total
ECRI	9000	6000	1000	1000	7000	4000	28000
CLEQM	9000	-	-	-	-	13000	22000
SRU	9000	2500	2000	1000	7000	10000	31500
Total	27000	8500	3000	2000	14000	27000	81500
%	33.1	10.4	3.7	2.5	17.2	33.1	100

Brief Evaluation of the Project Proposal

In general the project is quite clear and focused however a number of improvements could be made. The project overview provides some useful background information, however the actual problem that the proposal seeks to address could be made more clearly. It might be better to make the description of the negative impact more general rather than describing in detail information about toxic substances etc.

The proposal would benefit from being more clearly focused around a significant issue – then a case can be built up showing how certain activities can improve the problem and deliver other benefits besides.

In this case the problem could be summarized as “un-managed fish farming using floating cages in Nile branches”. The proposal aims to establish effective mechanisms for management of fish farming in these locations to reduce negative environmental impacts. Try to avoid describing particular technical issues unless it is essential to describe these to demonstrate the main problem.

The project objectives could also be further clarified and elaborated. Terms such as “hydraulic efficiency” might have little meaning to someone who has no technical expertise. The importance of stakeholder consultation is mentioned in the proposal – more could be said about this element of the project. Clearly management guidelines are only useful if they are to be implemented by the right stakeholders – the objectives could therefore be amended to reflect this.

The role of stakeholders in the project could also be developed – there’s a good opportunity to use stakeholders to carry out some of the collection of water samples and testing. In addition it may be worth considering whether the project could aim to develop guidelines and then pilot implementation of the guidelines to test their effectiveness. This would add another dimension to the project but would help in measuring the impact and offers scope for replication.

The project could also be consistent in terms of matching the outcomes, activities and expected results. One way to consider this is to look at what will be achieved at the end of the project and work backwards from this.

Project Proposal

Utilizing Local Made Geo-technical Geo--synthetics in Protecting Side Slopes of Open Water Channels from Seepage, Erosion, Sedimentation, and Instability, Egypt

1. Basic information

1.1. Basic information about the proposed project

Project Title	Utilizing Local Made Geo-technical Geo--synthetics in Protecting Side Slopes of Open Water Channels from Seepage, Erosion, Sedimentation, and Instability					
Project Acronym (abbreviation)	Protecting Side Slopes of Open Water Channels from Seepage, Erosion, Sedimentation, and Instability					
TIMEFRAME	START	march/2006	END	march/2008	DURATION	24 months

1.2. Information about project proponent / lead partner organization

Organization Name:	Construction Research institute	
Address:	Delta Barrage, Elkalubia,Egypt,13621	
Date established:	1976	
Hours of operation:	35 /week	
Website:		
Name and title of primary contact:	Prof. Ashraf ElAshail	
Phone: 002-02-2186992	**Fax:** 002-02-2188508	**Email:**
Name and title of additional contact	Assoc. Prof. Yehia Barakat	
Phone: 002-02-2185568	**Fax:** 002-02-2188508	**Email:** yehia_barakat@yahoo.com

2. Project overview or summary

Water conservation and sustainable water supply is a primary goal of the Egyptian government. The Ministry of Water Resources and Irrigation took the lead in that regard and established the National Water Research Center (NWRC), which oversees the activities of 12 research institutes. Water channels act as veins for delivering and distributing water for different purposes. Egypt has two networks of water channels; one for irrigation canals and the other for drainage purposes with the necessary control structures. The size of the canals network has grown tremendously in the past two decades in order to meet all the water needs in Egypt. However, there is a never-ending demand for irrigation and other usages of water to fulfil the goals of future development plans. This contradicts with the fact that Egypt has a constant share of River Nile water, which granted a change in strategy within the Egyptian irrigation school. They started to think into two parallel ways, developing new water resources, and executing water conservations plans through the enhancement and rehabilitation of canal network in order to cut down the water losses.

The Egyptian network of canals comprises all sizes of canals that range from the small farm canal (Meska) up to the large navigation canals (Rayaah). Most of those canals run through the old Nile Delta with its well-known low-permeability silty clay soil. However, a significant part of it runs through high-permeability sandy soil, especially in the newly developed reclamation areas. The silty clay soil, that composes the canal embankments in the Nile Delta acts as a natural barrier to water. This results in a great reduction in the losses of the precious canal water due to seepage. This seepage process not only causes big water losses in the irrigation system but also results in, in many cases, local failures in canal embankments. Thus, leads to additional economic losses in the form of rehabilitations costs, local flooding of farms and communities…etc. Moreover, in many of the newly developed reclamation areas the irrigation canals may lie very close to the drains network in the area. The water quality in the drains network is usually lower than the standards due to the human and industrial waste disposing purposes. The seepage of canal water into the drains network results in mixing the high quality canal water with the drains low quality water. Although, the irrigation engineers in Egypt have been trying to maximize the reuse of drainage water in irrigation, this still represents a severe loss of water quality through the irrigation system. It also represents a major environmental problem that has to be thoroughly investigated in order to reduce its effect.

The seepage flow through canal embankments causes the migration of the fine particles of the embankments, with the seepage flow, creating what is known as the piping phenomenon. This phenomenon results in internal erosion of the embankments and usually leads to gradual failure. The irrigation experts at the Ministry of Water Resources and Irrigation have been facing and trying to resolve this problem on a case-by-case basis utilizing several rehabilitation techniques. These techniques vary depending on the nature of the soil profile at the site and the levels of surface and ground water in the surrounding areas. Some of these techniques are constructing a supporting soil block to enhance the embankment stability, using a system of sheet pile walls or slurry walls to cut off the seepage flow, constructing an intercepting drain to collect the seepage flow, or a combination of any of them. In most cases, the option of supporting soil block is considered the most economical one. Using an engineering-designed block of soil, with the necessary filter, to replace the failed part of the embankment serves two purposes. The first purpose is embankment reconstruction while the second is seepage control. This in turn reduces the migration of the fine particles (internal erosion), which consequently increases the stability of the embankments.

The soil block usually consists of two parts. The first part (mixture of cohesive and cohesionless soils with enhanced engineering properties) acts as a supporting block whose purpose is to increase the stability of the embankment. The second part is an engineering-designed filter (of suitable gradation) whose function is to protect against internal erosion of the embankments. A major defect of this technique is the necessary measures to execute while having water in the channel. This usually causes a significant delay in the execution schedule as well as an increase in rehabilitation cost. Therefore, it is of great benefit to the owner to reduce the excavation activities in the canal bed and side slopes. This may be achieved through using advanced filter systems and installation technologies, which do not require large excavating regions and whose installation cost may be economically visible.

The geo-synthetics are engineering materials that have been developed through the past two decades or so, and have since been extensively used in engineering practice. They are usually manufactured by recycling the human and industrial waste, and that itself presents an environmental value to the society. Two well-known kinds of geo-synthetics that have been successfully used in civil engineering applications which are: geo-grids and geo-textiles. With the development of these materials, new technologies have also been introduced which added to their good engineering properties and low processing costs. Considerable research has been conducted on developing these new technologies in areas such as embankment's reinforcement using geo-grids or geo-textiles, geo-textile filters, and more

recently, canal lining using a combination of geo-textiles and concrete (known as Concrete Mattress).

Implementing the proposed project should help to reduce the water losses through irrigation system, enhance the stability of the canal embankments, and prevent erosion either surface or internal. This would result in valuable and sound water conservation as well as environment improvement measures. A reach of 100.50 m of a small canal will be chosen to conduct a pilot project of lining using geo-synthetics.

3. Functions of the Proposal

3.1. Project context or background to the issues/problem:

Many cases of slope failure due to seepage or existence of problematic soil such as soft clay or dispersive soil have been investigated by the Construction Research Institute (CRI). Three sites are selected to clarify the significance of such research project. The first is, Elesmailia canal, which has a length of 120 km before splitting into Suez irrigation canal and Port said canal. A major portion of that canal runs through poorly graded sandy soil, which results in seepage losses that were estimated as high as 45% of its discharge. The second case is at Ganoub Elkantara canal in Sinai, which is part of the Elsalam canal project. The soil profile in this case contains layers of problematic soil in the form of dispersive soil and soft clay. The third case is at the site of one of the major canals in upper Egypt known as Elbahr Elusifi. This case presents the effects of meandering flow on cross section scour and deposition and the successive failures that result from them.

Esmailia Canal
This is considered the main source of water for the newly developed areas in more than five governrates in Northern Egypt. In addition to the irrigation needs, the canal also supplies these areas with their industrial as well as drinking water needs. In order to meet the increased water demands in these areas, the canal is continuously upgraded by increasing the hydraulic cross section and/or water level to increase the canal discharge. The first stage of the canal upgrade aimed at supplying the water demand for 392000 Feddans, while the second stage aimed at adding another 400000 Feddans. The current canal cross-section, which represents the end of the second stage, has a bed width of 40 – 47 m, water depth of 3.5 – 4.5 m and side slopes 2:1. The third stage aims at increasing the cultivated area to 832000 Feddans, while the final stage aims at adding 250000 Feddans. The maximum discharge of the canal under investigation is approximately 197 m^3/s (17 million m^3/day) to irrigate an area of more than 450000 Feddans. The design bed slope is 6.5 cm/km in average.

Due to the continuous canal upgrading, the water level in the canal was raised, which led to raising the ground water level in the nearby-cultivated areas causing severe environmental problems. Some of these areas were badly affected, especially between kilometer 54,000 and kilometer 73,000 since the cultivated lands lie below the canal water level. The increase in ground water level caused problems to farmers in these areas, such as water logging, created bonds, and growing weeds.

Ganoub Elakantara Canal
In this site, problematic soil, in the form of dispersive soil and soft clay, dominated the soil profile. This case study includes an irrigation canal having a bed width of 10.0 m, a maximum water depth of 2.75 m, and a side slope of 3:1. The canal cross section is lined by gabions of gravel. According to the owner, the canal side slopes were stable until a parallel drain was constructed. The drain bed width is 5.0 m and the maximum water depth is 0.25 m. On the completion of the drain excavation, the instability problem started to show up in forms of drain side-slope failures, collapse of embankment surface, and collapse of the gabions on the canal side slopes. The failure process was initiated by salt leaching through the

soil mass of the drain embankments, followed by a successive migration of fine particles leading to a complete failure in some sections of the drain.

Elbahr Elusifi Canal

Elbahr Elusifi is the main source of Irrigation, domestic and industrial needs of Elfayoum governorate. The canal is a natural canal (not man made) and has a bed width of 44 – 46 m, water depth of 7 – 9 m and side slopes of 1:1. The canal has a unique feature, that its path contains several curves (meandering path). Because of such meandering soil, erosion occurs at almost every curvature throughout the path, creating side slope failures. Due to these failures, the local farmers have been complaining about their land losses.

3.2. Project rationale

The general theme of the project can be stated as "Water Conservation and Environmental Improvement Measures through Seepage and Erosion Control". This in fact is of strategic importance to the government of Egypt and the National Water Research Center as the research house for the Ministry of Water Resources and Irrigation. Implementing the ambitious future economic development plans of Egypt necessitates adopting a real and well-executed water conservation plan. This plane has to take into consideration the huge loss through the canals network, the resulting embankments failures and their environmental impacts.

The end and ultimate product of the proposed project is to provide the irrigation engineers at the Ministry of Water Resources and Irrigation with new economically visible technologies to resolve field problems. At the same time, the whole society will benefit through water conservation and environmental improvement measures. In order to achieve that goal, the above mentioned sites, where the seepage flow caused sever problems are selected as pilot projects for the study. The sites will be thoroughly investigated and the proposed new technology of canal lining under water, embankments reinforcement, and geo-textile filters will be tested, with the proper instrumentation installed. All the observation before, during and after installation will be thoroughly recorded and analyzed. Technical reports, with the proper recommendations and specification for the design and installation procedures will be prepared. Economical comparison between the typical and new technologies will also be reported so that it may be used as a guide for interested business investors.

3.3. Project impact

The impact of this project will be positive for the farmers at the end of the channel due to the enhancement of the channel transportation efficiency and will be negative for the framers at the beginning of irrigation canal due the problem of land evacuation in some situation. Also the enhancement of the channel embankment will increase the efficiency of transportation hence the embankments are used as a road way for most cases. The out of the research proposal may be used in the regional area which have the same characteristics and environmental conditions. The out put of the project will be sustainable hence the geo-textile has an expanded life cycle.

3.4. Overall project goal

The main goal of this research proposal will increase the efficiency of irrigation and drainage network performance in problematic areas.

3.5. Project objectives

The main objectives of such project is protecting of irrigation and drainage water courses against seepage losses, erosion, sedimentation and instability using the geo-technical geo-synthetics. This will be achieved through the following sub-objectives:

- Surveying number of sites where the seepage flow caused embankment internal erosion and/or failure.
- Collecting and analyzing all the necessary data at each site regarding soil profiles, surface and ground water conditions, and seepage flow condition.
- Investigating the reasons that lead to embankment failures at each site.
- Redesigning of the failed canal embankments at the surveyed sites with the proper seepage control measures using geo-synthetics.
- Lining a canal using a system of geo-textile and concrete mix (concrete mattress) and monitoring its behaviour after installation.
- Preparing the necessary technical as well as economical reports, with the proper recommendations and specifications for the design and installation procedures.
- Providing the suitable specifications needed for the improvement of the geo-synthetics industry in Egypt to finally produce an applicable local made geo-synthetics.

4. Staffing and Organizational Information

4.1. Information about the project proponents and partners

Project Proponent

The Construction Research Institute (CRI), Delta Barrage, Egypt, is one of the twelve research institutes within the National Water Research Center of the Ministry of Water Resources and Irrigation (MWRI). CRI is specialized in the field of geo-technical and structural engineering. The construction research institute has four departments. These departments are: Soil Mechanics and Foundation, Irrigation Construction, Material, and Structural dynamic. CRI has a broad experience in drilling and monitoring activities in many places all over Egypt. The Construction Research Institute, National Water Research Center – Ministry of Water Resources and Irrigation, is the main authority responsible for implementing the project ”Utilizing Local Made Geo-technical Geo-synthetics In Protecting Side Slopes of Open Water Channels from Erosion, Sedimentation, and Instability”.

The following is a partial list of the research and consulting projects conducted by the CRI staff:

- The exploratory geo-technical studies at the site of the gigantic pump station, stilling basin, and El-Sheikh Zayed canal path of the South of Egypt Project.
- The Geo-technical studies to strengthen the El-Salam canal embankments west of Suez Canal.
- The Geo-technical studies for the Construction of the new El-Saff canal from intake to kilometer 24.00.
- The geo-technical studies of Lake Moot in El-Wady El-Gaded.
- The geo-technical and structural studies to widen the El-Lahoon lock at
- El-Lahhon power station site.
- The geo-technical studies at the site of Syriaquos Barrage and lock.
- The geo-technical studies of Wady Karkar Dam at Aswan.
- The geo-technical studies of the secondary dams near the High Aswan Dam.
- The structural studies for the construction of a retaining wall at Yosef Sea in front of Qayet-bay Mosque in Fayoum.
- The geo-technical studies for the lining of El-Postan canal.

- The geo-technical studies of West El-Nobaria drain.
- The geo-technical and structural studies to strengthen the bridge at Damietta Dam.
- The geo-technical studies to upgrade the navigation of Damietta Nile branch.
- The geo-technical studies of the new Damietta canal.
- Strengthening of the foundations of Bahr El-Bakar Syphone using the technique of sand drains.
- Many studied for the side slope stability of irrigation and drainage canals through out Egypt and their rehabilitation.
- Technical and research studies of earth reinforcement to upgrade the water channels cross sections.

And last but not least the CRI is involved, as a consultant, in most of the important national projects such as development of South of Egypt project, El-Salam canal project, and other MWRI's projects to achieve the safest and most economical operating conditions of the structures. Furthermore, the CRI conducts geo-technical studies for the structures executed by other ministries and governmental agencies in Egypt. CRI will make the next resources available for the implementation of the project:

- Laboratory equipments available at the following labs:
- Soil Mechanics and Foundation Engineering Laboratory
- Construction Modelling Laboratory
- Properties of Material Laboratory
- Chemical Laboratory
- Computer Laboratory
- Field equipments such as drilling rig, field testing machines, etc.
- Vehicles for field investigations to collect the necessary data, supervise the field pilot project, and exchange visits with experts from the other governmental and private sectors.
- Qualified and experienced personnel trained at different international and national universities as members of the research teams.

The construction Research Institute will conduct the required field and lab investigation in addition to numerical studies to achieve the objective of this proposal.

Project Partners

The partners will be the interested sectors at the Ministry of Water Resources and Irrigation in addition the interested ministry involved with the project such as transportation etc. MWRI is responsible to save water demands at the field site for the farmer and it has a very qualified staff that may help in conducting of this project. The Ministry of Transportation used the road that constitutes the water courses embankment which may have a lot of problem due to these embankments failure. Their contribution may be feeding back the available data that could serve this study.

4.2. Information about the project stakeholders

The major stakeholders are the farmers, Ministry of water Resources and Irrigation, and Ministry of Transportation.

5. Project Methodology

5.1. Work Packages

Plan of Activities

As discussed earlier the proposed project emphasizes three major new technology applications: using geo-synthetics to reconstruct soil-reinforced canal embankments, using geo-textile filters to protect against embankments internal erosion due to migration of fine particles, and using concrete mattress in canal lining under water. These applications are described next.

Work-package No	Action No	Start (mm/yy)	End (mm/yy)	Description of activities, components, means	Responsible Partner	Involved Partners	Location	Expected output / deliverables
WP1	1	March/2006	April/2006	Preparation and transportation of the required equipment to the field	CRI	CRI	Project area	Starting the field investigation
	2	Aprile/2006	December/2006	Geo-technical investigation with required field tests	CRI	CRI	Project area	Carrying out the field test and obtaining the required soil sample
	3	May/2006	January/2007	Lab tests	CRI	CRI	CRI Lab	Identifying the required soil parameters and soil profile
	4	January/2007	March/2007	Geo-technical report preparation	CRI	CRI	CRI	Technical report
WP2	1	April/2006	October/2006	Hydraulic measurement	CRI	CMRI	Project area	Field measurements
	2	October/2006	December/2006	Seepage losses estimation and evaluation	CRI	CMRI	CRI &CMRI	Percentage of losses
WP3	1	March/2007	October/2007	Model verification and numerical study	CRI	CRI	CRI computer Lab	Factor of safety and solution technique with generalized specification
	2	October/2007	March/2008	Reporting	CRI	CRI	CRI	Technical Reports

6. Project results

Activities	Expected Results	Performance Indicators	Critical Conditions (Assumptions and Risks)
Seepage losses	Minimizing seepage losses and facing the main problem that may raise in the case of lining under water	% Efficiency	- Complete survey for the failed water courses - Estimate the risk that may happen if the project not realized
Erosion	Minimizing the erosion and soil immigration (internal erosion)	Efficiency	
Instability	Increasing the stability of the embankment and side slope	Factor of safety	

6.1. Project Outcomes

The main outcomes of this research project will be:

1. Better performance of the network of irrigation canals in Egypt.
2. Reducing the losses in irrigation and drainage water channels, improving their efficiency and maximizing the benefits of the Egyptian share of River Nile. This will save more water for the future development plans and help in improving the usage of irrigation water in Egypt.
3. Stabilizing the side slopes of unstable water channels and minimizing the probable erosion whether internal or surface.
4. Improving the environmental protection measures through introducing a useful and environmental friendly new industry of manufacturing geo-synthetics using recycled human and industrial waste.
5. Introducing the new industry in the market creates new investment opportunities that help in improving the overall economic situation in Egypt.
6. The new investments create plenty of employment opportunities for the Egyptians, which assist in improving the economic development of the whole society.

7. Monitoring and Evaluation

Monitoring and evaluation of this project will be conducted through three pilot projects one for each problem that will be studied. The studied problems are seepage losses, erosion, and instability of the embankment and side slope.

Project monitoring activities	Indicators used	Responsible	Dates
Seepage losses	discharge	CRI and HRI	6 months
Erosion	Scour depth or piping evolution	CRI and HRI	6 months
instability	Lateral and vertical movement	CRI	6 months
Project evaluation activities	**Indicators used**	**Responsible**	**Dates**
Seepage losses	% efficiency	CRI and steering committee	1 month
Erosion		CRI and steering committee	1 month
instability	Factor of safety	CRI and steering committee	1 month

8. Project personnel

C.V. upon request.

9. Project Budget

9.1. Project costs

Total budget required for the project is 241 500 Euro.

9.1.1. Project costs per items and partner (in Euro)

	Personnel	Meeting and conferences	Travel and accommodation	Promotion and publication	External expertise and audit	Equipment and material and rents	Operational coasts	others	Total
Proponent	35000	9000	6000	4000	5500	100000	25000	10000	194500
Partner 1	10000	3000	1000	1500	2500	20000	5000	4000	47000
Total	45000	12000	7000	5500	8000	120000	30000	14000	241500
%	18.63	4.69	2.89	2.27	3.31	49.68	12.42	5.79	100

Brief Evaluation of the Project Proposal

The proposal is well presented and the document is very comprehensive. Much of the content of the proposal is quite technical and this makes it difficult to read for the non-technical person. It is worth keeping this in mind when drafting a proposal for donor – try to avoid using too much technical language unless it is completely necessary.

The project title is very long and also quite technical. Ideally the title should describe very briefly what the project aims to do – however it is important not to overload the title with too much information. The general theme of the project mentioned in Section 3.5 might actually make a better title.

The project section that provides an overview is quite long and would benefit from being edited down. Much of the information that is included is very specific – it's better in this section to aim for a broad picture rather than anything too detailed. Just aim to cover: what the problem is, the impacts of the problem and a brief summary of why the proposed solution is the best one.

Section 3 also goes into quite a lot of detail including technical language that is difficult for the non expert. Rather than describe in detail specific problems for each canal it could be appropriate to provide a summary with the geographic information attached in a map as an Annex (if the donor permits supporting documents in this way).

Section 3.6 could be more focused on what the outcome of the project will be – in terms of more effective and sustainable management of water resources. In the section about project objectives there is quite a lot of information that actually describes activities such as collecting and analyzing – it's better to present this information separately.

Section 6 of the proposal is quite strong. The project outcomes are well described and very clear. It might be worth reviewing the proposal – taking into consideration that these outcomes are really what the

project aims to achieve and working back from them. So that in order to stabilize the slope, it's necessary to deliver a clear set of activities, starting with survey. The proposal describes the new investments that will be created by the project – if this is a realistic outcome it might be necessary to be clear about what activities can be carried out to support this.

Project Proposal

Effective management of the aquatic weeds infestation and its impacts in Nasser lake by using remote sensing and geographic information system, Egypt

1. Basic information

1.1 Basic information about the proposed project

Project Title	**Effective management of the aquatic weeds infestation and its impacts in Nasser lake by using remote sensing and geographic information system (GIS)**					
Project Acronym (abbreviation)						
TIMEFRAME	START	(01/2006)	END	(01/2008)	DURATION	24 months

1.2 Information about project proponent / lead partner organization

Organization Name:	Channel Maintenance Research Institute (CMRI) - NWRC	
Address:	Delta Barrage.P.O. Box 13621, Kalyiobia, Egypt	
Date established:	1975	
Hours of operation:	8 Hours	
Website:	www.nwrc-egypt.org	
Name and title of primary contact:	Prof. Dr. Mohamed Bakry	
Phone:	**Fax:**202 2189596	**Email:** Bakcmri@hotmail.com
Name and title of additional contact	Dr. Hosam Ibrahim	
Phone:	**Fax:** 202 2189596	**Email:** Hosamm32@hotmail.com

2. Project overview or summary

The current lake's water quality now is satisfactory for all uses. However, recent observations in Nasser lake showed the appearance of weeds and algae in scattered locations. The existence of such species is an indicator of possible water quality deterioration in the lake. Moreover the growth of algae would cause real threats to the water quality and consequently the aquatic life in the whole lake on the long run. Besides, If water quality is deteriorated and became unsuitable for some uses, the water budget for the whole country will be severely unbalanced. Therefore, the conservation of water quality in this huge reservoir should be greatly considered. Several measurements can be taken to preserve the original conditions, and even to restore the water quality of the lake.

Channel Maintenance Research Institute (CMRI) proposes to study by using remote sensing (satellite

images) and geographic information system (GIS) technologies in distinguishing and mapping the distribution of aquatic weeds in the main Khores. The final satellite images covered the studied Khores will show the location and the percentage of aquatic weeds distribution. The intensive aquatic weed infestations may cause a lot of problems by creating losses of water as well as the fishery productions, retardation of flow, interference with navigation, health hazards and alteration in the physico-chemical characteristics of both water and hydro-soil.

3. Functions of the Proposal

3.1 Project context or background to the issues/problem

Lake Nasser provides about 95%of Egypt's water resources. The Lake was formed after the construction of Aswan High Dam, and started to fill since 1967. The Lake is considered as the safety element for Egyptians against threats of both droughts and floods. The Lake is characterized by its very long extension and narrow width as shown in the given map.

The Lake is monomictic with a single circulation period in winter. However, it is stratified in the top 15 meters during summer. The current lake's water quality now is satisfactory for all uses. However, recent observations in the lake showed the appearance of weeds and algae in scattered locations. The existence of such species is an indicator of possible water quality deterioration in the lake. Moreover the growth of algae would cause real threats to the water quality and consequently the aquatic life in the whole lake on the long run. Besides, If water quality is deteriorated and became unsuitable or some uses, the water budget for the whole country will be severely unbalanced Therefore, the conservation of water quality in this huge reservoir should be greatly considered. Several measurements can be taken to preserve the original conditions, and restore the water quality of the lake.

This project is introducing a scientific approach for assessing the potential threat to water quality in the lake, and also investigates the necessary practical action to be taken to conserve the lake's water quality.

3.2. Project rationale

1. Monitoring the aquatic weeds infestation in Nasser Lake Khores by using GIS
2. Monitoring the physical and the chemical parameters in the water and the sediment

3.3. Project impact

1. Enhancing the water quality in the Lake
2. Effective management of the aquatic weeds in the Lake
3. The impact of drainage system on groundwater to control contamination through water seepage to the Lake

3.4. Overall project goal

1. Monitoring the aquatic weeds infestation in Nasser Lake Khores by using GIS
2. Monitoring the physical and the chemical parameters in the water and the sediment

3.5. Project objectives

Predicting the aquatic weeds infestation during the near future (five years) all-over the studied Khores.

4. Staffing and Organizational Information

4.1 Information about the project proponents and partners

Project proponents
High Aswan Dam Authority, the Ministry of Water Resources and Irrigation.

Project participants
Channel Maintenance research Institute, High Aswan Dam Authority.

A brief description of the Principal organization
Channel Maintenance Research Institute (CMRI) is conducting design of open channels and maintaining of the open channels covering the irrigation and drainage networks in n Egypt. CMRI carried out several studies using remote sensing (satellite images) and geographic information system (GIS) technologies in distinguishing and mapping the distribution of aquatic weeds in the main Khores.

Project Manager
Name: Prof. Mohamed Fawzy Bakry
Title: Director of Channel Maintenance Research Institute-NWRC
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Principal Investigators
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4.2. Information about the project stakeholders

Channel Maintenance research Institute, High Aswan Dam Authority.

5. Project Methodology

5.1. Work Packages
The proposed study will be undertaken within 2 years as the following:

The first year
Study the aquatic weed problems in Nasser Lake will be carried out to formulate one question “What are the type of the aquatic weeds and their infestations along the lake?

In order to answer this question, data will be collected on the following items:

1. Establish and develop a comprehensive geo-referenced database for Nasser lake concerning the type of aquatic weeds and their infestation. The database will depend on:
   1 Collecting data from published papers concerning the aquatic weeds infestations along Lake Nasser
   2 Collecting data from some authorities such as Ministry of Agriculture, Ministry of Water Resources and Irrigation, etc.
   3 Detecting the most heavily infested locations along Nasser lake that cause serious problems.
   4 Defining the history of the presence of weeds in the lake for several years ago
   5 Using the collected data, new modern technologies that contain a set of satellite images could be integrated with the GIS for distinguishing and mapping the distribution of the aquatic weeds

2. Determine the potential negative impacts of excessive aquatic weeds infestations along the proposed study areas

3. Monitor water quality, algae types, and other species along Nasser lake which affect on the weed growth

4. Determine the pollution sources qualitatively and quantitatively

The second year

The second year will focus on the following:

1 Testing the most appropriate tools/methods to control the aquatic weed infestations. It will be standardized by a group of experts in order to translate the shared vision into concrete action

2 Conducting series of training courses under the foregoing programs for the benefit of the staff to meet the challenge of water resources management, types of aquatic weeds, problems of aquatic weeds, and methods for aquatic weed control

Plan of Activities:

Work Package No	Work Package title	Responsible Partner	Involved Partners involved
WP1	Establish and develop a comprehensive geo-referenced database for Nasser lake concerning the type of aquatic weeds and their infestation The database will depend on: • Collecting data from published papers concerning the aquatic weed infestations along Lake Nasser a. Collecting data from some authorities such as Ministry of Agriculture, Ministry of Water Resources, etc. b. Detecting the most heavily infested locations along Nasser lake that cause serious problem c. Defining the history of the presence of weeds in the lake for several years ago d. Using the collected data, new modern technologies that contain a set of satellite images could be integrated with the GIS for distinguishing and mapping the distribution of the aquatic weeds		
WP2	Determine the potential negative impacts of excessive aquatic weed infestations along the proposed study areas		
WP3	Monitor water quality, algae types, and other species along Nasser lake which affect on the weed growth		
WP4	Determination of pollution sources qualitatively and quantitatively		
WP5	Testing the most appropriate tools/methods to control the aquatic weed infestations. It will be standardized by a group of experts in order to translate the shared vision into concrete action		
WP6	Conducting series of training courses under the foregoing programs for the benefit of the staff to meet the challenge of water resources management, types of aquatic weeds, problems of aquatic weeds, and methods of aquatic weed control		

Work-package No	Action No	Start (mm/yy)	End (mm/yy)	Description of activities, components, means	Responsible Partner	Involved Partners	Location	Expected output / deliverables	
WP1	1	1/2006	7/2006	Establish and develop a comprehensive geo-referenced database for Nasser lake concerning the type of aquatic weeds and their infestation The database will depend on: a.Collecting data from published papers concerning the aquatic weed infestations along Lake Nasser	CMRI			Implementing a data base for aquatic weeds infestation in Nasser Lake Khores	
	2	1/2006	7/2006	b. Collecting data from some authorities such as Ministry of Agriculture, Ministry of Water Resources, etc.	CMRI	AHDA		Implementing a data base for aquatic weeds infestation in Nasser Lake Khores	
	3	1/2006	7/2006	c. Detecting the most heavily infested locations along Nasser lake that cause serious problem.	CMRI	AHDA		Implementing a data base for aquatic weeds infestation in Nasser Lake Khores	
	4	1/2006	7/2006	d. Defining the history of the presence of weeds in the lake for several years ago.	CMRI			Implementing a data base for aquatic weeds infestation in Nasser Lake Khores	
	5	1/2006	7/2006	e. Using the collected data, new modern technologies that contain a set of satellite images could be integrated with the GIS for distinguishing and mapping the distribution of the aquatic weeds	CMRI			Determine locations of overgrowth aquatic weeds and detect their negative potential impact on the ecosystem in lake Nasser	

WP2	1	1/2006	1/2007	Determine the potential negative impacts of excessive aquatic weed infestations along the proposed study areas	CMRI	AHDA		Determine locations of overgrowth aquatic weeds and detect their negative potential impact on the ecosystem in lake Nasser	
WP3	1	2/2006	7/2006	Monitor water quality, algae types, and other species along Nasser lake which affect on the weed growth	CMRI			Extend the knowledge of the environmental factors and their key roles in determining the biomass allocation in aquatic weeds	
WP4	1	1/2006	1/2007	Determination of pollution sources qualitatively and quantitatively	CMRI			Extend the knowledge of the environmental factors and their key roles in determining the biomass allocation in aquatic weeds	
WP5	1	1/2007	1/2008	Testing the most appropriate tools/ methods to control the aquatic weed infestations. It will be standardized by a group of experts in order to translate the shared vision into concrete action					
WP6	1	6/2007	7/2007	Conducting series of training courses under the foregoing programs for the benefit of the staff to meet the challenge of water resources management, types of aquatic weeds, problems of aquatic weeds, and methods of aquatic weed control				Improve the capacity building of staff in water resources management issues by providing series of training courses concerning the aquatic weeds and their control	

Year	1												2											
Months	**jan**	**Feb**	**mar**	**apr**	**may**	**jun**	**jul**	**aug**	**sep**	**oct**	**nov**	**dec**	**jan**	**feb**	**mar**	**apr**	**may**	**jun**	**jul**	**aug**	**sep**	**oct**	**nov**	**dec**
No months (1,2,3,...)																								
- Work Package 1																								
- Action 1.1																								
- Action 1.2																								
- Action 1.3																								
- Action 1.4																								
- Work Package 2																								
- Action 2.1																								
- Work Package 3																								
- Action 3.1																								
- Work Package4																								
- Action 4.1																								
- Work Package 5																								
- Action 5.1																								
- Work Package 6																								
- Action 6.1																								

6. Project results

Activities	Expected Results	Performance Indicators	Critical Conditions (Assumptions and Risks)
- Collecting data from some authorities such as Ministry of Agriculture, Ministry of Water Resources, etc. -Defining the history of the presence of weeds in the lake for several years ago. -Using the collected data, new modern technologies that contain a set of satellite images could be integrated with the GIS for distinguishing and mapping the distribution of the aquatic weeds - Detecting the most heavily infested locations along Nasser lake that cause serious problem	Establish and develop a comprehensive geo-referenced database concerning types of aquatic weeds and their infestations in lake Nasser and its khores.		Creating a data base for all activities. Training institute staff for carrying out the GIS analysis and remote sensing technologies
-Determine the potential negative impacts of excessive aquatic weed infestations along the proposed study areas -Monitor water quality, algae types, and other species along Nasser lake which affect on the weed growth	Extend the knowledge of the environmental factors and their key roles in determining the biomass allocation in aquatic weeds		Support the ministry to protect the water resources environment in Nile River.

Activities	Expected Results	Performance Indicators	Critical Conditions (Assumptions and Risks)
-Determination of pollution sources qualitatively and quantitatively	Determine locations of overgrowth aquatic weeds and detect their negative potential impact on the ecosystem in lake Nasser (especially water losses and fish production)		Support of the minister of irrigation and water resources. Support the decision maker in selecting the time and the required budget for aquatic weeds management
-Testing the most appropriate tools/methods to control the aquatic weed infestations. It will be standardized by a group of experts in order to translate the shared vision into concrete action	Determine the aquatic weeds controlling methods (manual - mechanical) in order to find the most required appropriate control methods in each determined location		Using consultants for insuring the availability of the out put. Support the ministry to protect the water resources environment in Nile River.
-Conducting series of training courses under the foregoing programs for the benefit of the staff to meet the challenge of water resources management, types of aquatic weeds, problems of aquatic weeds, and methods of aquatic weed control	Improve the capacity building of staff in water resources management issues by providing series of training courses concerning the aquatic weeds and their control.		

6.1. Project Outcomes

The outcome of the project addresses how the results are expected to change the situation the project addresses. The outcome of the project is therefore reflected in the project goal.

7. Monitoring and Evaluation

Project monitoring activities	Indicators used	Responsibility	Dates
Using a specific soft ware for analyzing the satellite images	-Using consultants for verifying the accuracy of the out put results	CMRI	1/2006 - 1/2007
Measuring the physical and the chemical parameters in water surface and different depths from water surface and also from the sediment	Using the Egyptian allowable standard for law 48/1982 for the measurable allowed some parameters in irrigation and drainage watercourses	CMRI	1/2006 - 1/2007

Project evaluation activities	Indicators used	Responsibility	Dates
Every six months	Initial results reports	CMRI	6 &12 /2006 - 6 / 2007
End of the project	Final report	CMRI	12/2007

8. Project personnel

Name	Position/Title	Qualifications relevant to the project	Experience relevant to the project
Prof. Dr. Mohamed Fawzy Bakry	Director of Channel Maintenance Research Institute-NWRC		
Dr. Magdy Mohamed Hosny	Associate Prof. Researcher, Channel Maintenance Research Institute-NWRC		
Dr. Hosam Mahmed Ibrahim	Associate Prof. Researcher, Channel Maintenance Research Institute-NWRC		
Dr. Salwa Abou Elella	Researcher, Channel Maintenance Research Institute-NWRC		

9. Project Budget

9.1. Project costs

9.1.1 Project costs per items and partner (in Euro)

Estimated budget: L.E. 0.3 Millions Euro (L.E. 0.15 Million Euro yearly for 2 years)

Brief Evaluation of the Project Proposal

The project proposal is well though out and clearly presented. Although the scope of activity is quite technical the amount of technical language is limited – in some cases specific language is used (e.g. Khores) that would be difficult for a reader with no prior understanding.

In setting out the project overview it can be useful to begin with a sentence that describes what the project aims to do, such as: "Lake Nasser provides 95% of Egypt's fresh water – this project aims to utilize technology to manage invasive weed species that can threaten this resource."

The section on project context contains some technical language that could be difficult for non technical personnel to understand. This same section makes a number of points that underline the importance of the project in terms of maintaining effective management of water resources – and the potential of

Project Proposal

Geo-Information Management System for Evaluating the River Nile Banks Stability (GISNB)

1. Basic information

1.1 Basic information about the proposed project

Project Title	Geo-Information Management System for Evaluating the River Nile Banks Stability					
Project Acronym (abbreviation)	GISNB					
TIMEFRAME	START	1/2006	END	1/2008	DURATION	24 months

1.2 Information about project proponent / lead partner organization

Organization Name:	Survey Research Institute	
Address:	308 Al Ahram Street Al-Talbia Giza.	
Date established:		
Hours of operation:	From 8:0 a.m to 3:0 p.m	
Website:		
Name and title of primary contact:	Prof. Dr. Maha Tawfik, director of Institute.	
Phone: 5849283	**Fax:** 5849297	**Email:** SRI_NWRC@yahoo.uk.co
Name and title of additional contact	Dr. Hanan Farag, Head of GIS unit.	
Phone: 5849283	**Fax:** 5849297	**Email:** Hanan_Farag@yahoo.com

2. Project overview or summary

The stability of River Nile banks has a major economical, environmental and social influence on the people living along the river banks. Banks' stability comprises many hydraulic, spatial and temporal parameters varying continuously, which enhances the need of Geo-Information system capable to store, manipulate, analyze spatially and update diverse data easily and efficiently.

Furthermore, the management of the large amount of data related to the River Nile Banks needs to be stored in well organized system. In addition, the variation of data spatially and temporally requires a system capable of updating these data regularly. The system will provide a full power of managing spatial and attribute data offering an appropriate tool for studying the stability of the River Nile banks.

Researchers, technicians, water sector organizations and decision makers will be involved in this project. Their contribution will be in controlling the irrigation and drainage systems and providing their experience. The most beneficiaries will be the land owners along the river banks. The initial proposed project will cover the pilot area along the Nile River banks.

This project is enhancing the proper controlling of the irrigation and drainage systems based on the stability of the river banks. So, it is expected to be expanded along the River Nile banks from Aswan to Delta after implementing the results of the proposed methodology. The suggested project can be considered as a pilot project which can be addressed in other region suffering from the instability of river banks.

To execute the suggested project, experts in the field of geo-technical engineering will be involved. They provide the data concerning the soil properties of the banks. Also, experts in hydraulic theories are needed for proper implementation of the project outputs, to help decision makers in selection of the best sites for construction the hydraulic structures and the technical contribution of the directories of irrigation and drainage system in the pilot area.

The SRI will provide the surveying equipment required GIS software, facilities, space, supplies and the qualified staff in the field of survey and GIS. This staff will be contributed in data collection and construction the geo-information system. In addition, the project will need a technical support in the fields of hydraulic and geo-technical engineering and the co-operation of the directories of irrigation, drainage and water sectors authorities.

3. Functions of the Proposal

3.1 Project context or background to the issues/problem

The management process for the river banks stability should take into account the economical, environmental and social influences on the people living along the river banks. Banks' stability comprises many hydraulic, spatial and temporal parameters varying continuously, which enhances the need of Geo-Information system capable to store, manipulate, analyze spatially and update diverse data easily and efficiently. The system will provide a full power of managing spatial and attributes data offering an appropriate tool for studying the stability of the River Nile banks.

3.2 Project rationale

The project will develop the methodology for compiling a geo-information system to a slope stability program. This will develop decision support system capable of evaluating the stability of any section along the River Nile banks. The developed system will be able to store and retrieve data easily and in a limited time according to any future field variations or observations.

3.3 Project impact

The project has different influences in the environmental and social scale. The land owners who are living along the river banks are considered the main sector affected by the project outcomes in order to protect their land, homes and their agricultural activities. The organizations responsible for building the hydraulic structures are indulged with the project in order to design adequate structures capable of efficient controlling of irrigation and drainage in the study area. After implementing the project outputs, an assessment will be presented to be applied in region suffering of the same problems. The project first phase will be applied in a pilot area and then expand to cover the river banks from Aswan to Delta.

3.3. Overall project goal

Developing a Management Information System to analyze the stability of River Nile banks and to define the priority of River banks sites which need banks protection.

3.4. Project objectives

- Define the significant parameters influencing bank stability along the Nile River
- Customize a geo-information system to store, organize and manipulate the data describing any particular section along the river banks
- Develop a code that permits the retrieval of geometric, hydraulic and geotechnical properties from the geo-database to be analyzed by a slope stability program in order to assess the stability of the river banks.
- Present the results of the engineering code in an integrated geographical framework that relates the information and results to their spatial location along the river banks.
- Execute the proposed methodology on a pilot area for developing engineering code capable of assessment the stability of any river banks.

4. Staffing and Organizational Information

4.1. Information about the project proponents and partners

The researchers who work in the survey institute are in charge in designing the geo-database and the proposed methodology, engineers and technicians collect the field data needed using survey instruments, analyze queries of geo-database and implement the outputs of the project. In addition experts are involved in the hydraulic and geotechnical designs to provide the adequate information needed for assessing the river banks stability. Construction Research Institute (CRI) is considering one of the research institutes of the National Water Research Canter (NWRC) which has a great experience in the field of geo-technical studies. Also, Hydraulic Research Institute (HRI) is the research institute concerning mainly with the hydraulics studies. In addition, Water sector authorities play significant role in controlling the irrigation and drainage systems in the pilot area studied.

4.2 Information about the project stakeholders

The main stakeholders involve in the project are the land owners along river banks, they report the actual situation of the banks and any sudden modifications .Organisations responsible of building the hydraulic structures on the river banks provide valuable consultations regarding hydraulic impact in the area studied. Staff of SRI institute plays an active role in executing the project based on their experience in the survey and GIS domains. Directories managing the irrigation and drainage systems in the pilot area offer great support to the project by supplying expert staff needed in the evaluation of the river banks stability.

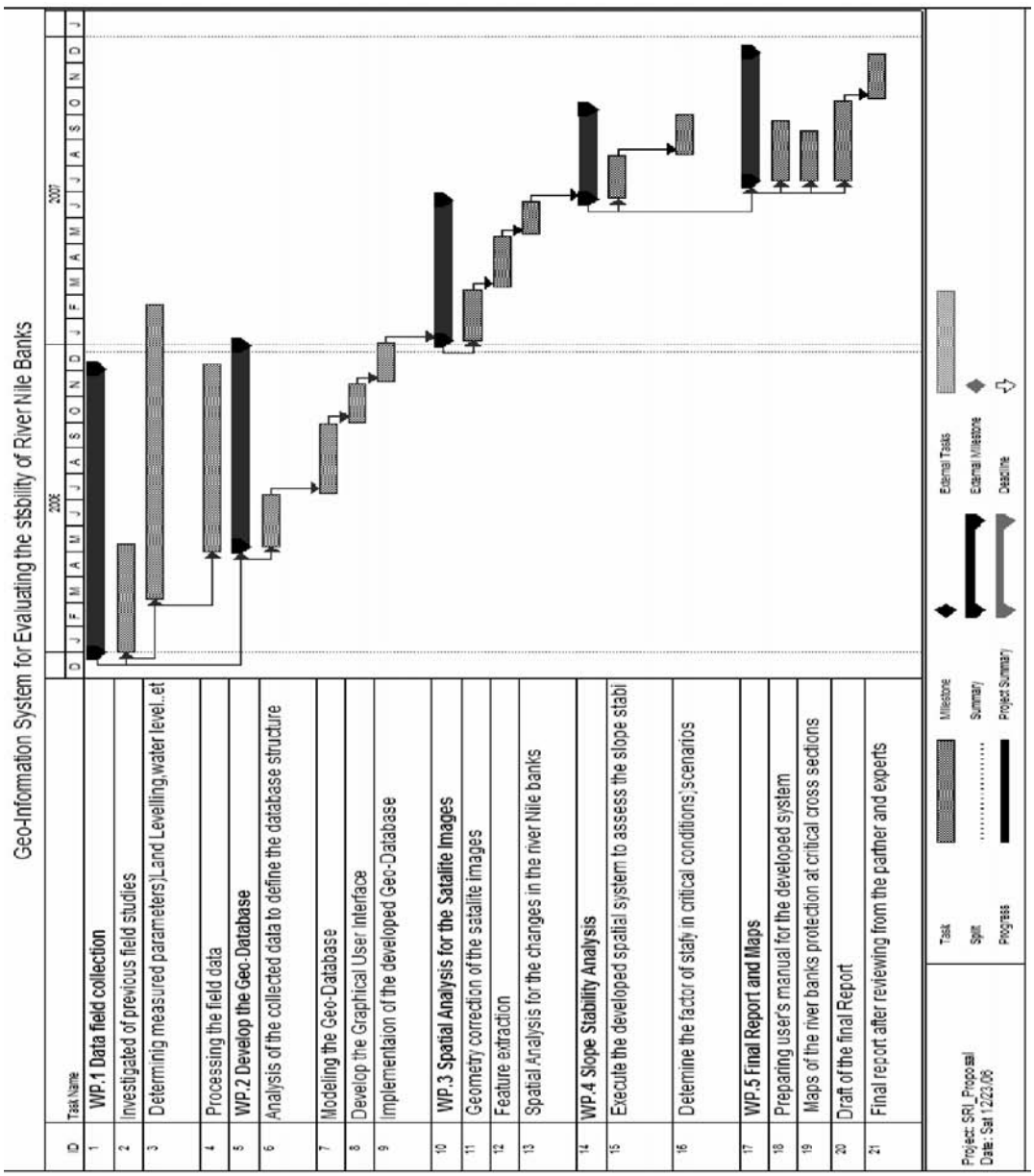
5. Project Methodology

5.1 Work Packages

Work Package No	Work Package title	Responsible Partner	Involved Partners involved
WP1	Data field collection	SRI Staff CRI Staff HRI Staff	Hydraulics and geotechnical experts (CRI), (HRI)

WP2	Develop the Geo-Database	SRI Researchers	
WP3	Spatial Analysis for the Satellite Images	SRI Researchers	
WP4	Slope Stability Analysis	CRI Staff	
WP5	Final Report and Maps	SRI Staff CRI Staff HRI Staff	Hydraulics and geotechnical experts (CRI), (HRI)

The detailed project activities plan is described in the next chart and the critical activities are determined.



6. Project Results

In this section the project expected results will be described. In addition, four progress reports (every six months) will be published. User's manual guide for the developed system and information maps are one of the expected project outputs.

Activities	Expected Results	Performance Indicators	Critical Conditions (Assumptions and Risks)
Data field collection	Technical report of the field measured data	Follow up system based on the time scheduling plan for the activities through defining Critical Path Method (CPM)	-Financial Support -Permanent Qualified Staff
Develop the Geo-Database	Information reports which present the actual situation and the prediction of the future changes.		Financial, Human and physical resources
Spatial analysis for the Satellite Images	Maps of the river Nile banks.		-Financial resources -Permanent Qualified Staff
Slope Stability Analysis	Factor of safety (F.S) of the slope stability in critical condition		

6.1. Project Outcomes

The expected project outcome is enhancing the controlling of the irrigation and drainage systems based on the stability of the river banks. So, it is expected to be expanded along the river Nile banks from Aswan to Delta after implementing the results of the proposed methodology. The suggested project can be considered as a pilot project which can be addressed in other region suffering from the instability of river banks.

7. Monitoring and Evaluation

Project monitoring activities	Indicators used	Responsibility	Dates
The validation of the geo-database	Capability of the system to support the updated data	SRI researcher	Jan 2007
The acquisition of surveying field data	Reviewing of integrated field data and comparing with the satellite images	SRI, CRI researcher	

IPTRID

The International Programme for Technology and Research in Irrigation and Drainage (IPTRID) is an international multi-donor programme, co-managed by partner organizations, created in 1990 at the request of the International Commission for Irrigation and Drainage (ICID).

Its Secretariat, first located at the World Bank, was transferred to FAO in 1998, where it is being hosted, in the Land and Water Division (NRL) as a Special Programme.

IPTRID aims at improving the uptake of research, exchange of technology and management innovations by means of capacity development in the irrigation and drainage systems and sectors of developing countries to reduce poverty, enhance food security and improve livelihoods, while conserving the environment.

IPTRID acts as a facilitator mobilizing the expertise of a worldwide network of leading institutions in the field of irrigation, drainage and water resources management.

Together with its partners, the IPTRID Secretariat provides advisory services and technical assistance to countries and development agencies, for the formulation and implementation of strategies, programmes, and projects. During the last ten years, it has been supported by more than twenty international organizations and government agencies.The present Programme is cofinanced by the Food and Agriculture Organization of the United Nations (FAO),the United Kingdom, the Netherlands, France and Spain, the World Bank and the International Fund for Agricultural Development (IFAD).

For further information about the IPTRID Programme,
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