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LITANI RIVER BASIN MANAGEMENT SUPPORT PROGRAM

THE ROLE OF THE LITANI RIVER AUTHORITY: PRESENT AND FUTURE

July 2010
This report was produced for review by the United States Agency for International Development (USAID). It was prepared by International Resources Group (IRG) under Contract EPP-I-00-04-00024-00 order no 7.

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ACRONYMS

BRWE	Bekaa Regional Water (and Wastewater) Establishment
CDR	Council for Development and Reconstruction
IRG	International Resources Group
LRA	Litani River Authority
LRB	Litani River Basin
MCM	Million Cubic Meters
MEW	Ministry of Energy and Water
MoA	Ministry of Agriculture
MoE	Ministry of Environment
MoF	Ministry of Finance
RBMP	River Basin Management Plan
RWE	Regional Water Establishments
SLWE	Southern Lebanon Water and Wastewater Establishment
USAID	United States Agency for International Development
WFD	European Water Framework Directive
WUA	Water Users Association

FOREWORD

This report was prepared by International Resources Group (IRG), the main contractor under the Litani River Basin Management Support (LRBMS) Program, a USAID-funded program in Lebanon (Contract EPP-I-00-04-00024-00 Task Order No.7) under the Integrated Water and Coastal Resources Management Indefinite Quantity Contract (IQC) II.

It is mostly based on a paper prepared by Mark Svendsen, Senior Water Institutional Specialist, IRG. It was made possible by the preliminary work done by Said Bitar, consultant to the LRBMS project, and the inputs and advice of Eric Viala, Ali Abboud, Abdo Tayar, Nabil Amacha, Bassam Jaber, and Adib Geadah, among others.

EXECUTIVE SUMMARY

PROGRAM BACKGROUND

The LRMBS Program is a four-year program to improve water management in the Litani River Basin in the Bekaa. It is undertaken by IRG, in cooperation with LRA, and is funded by USAID. The program began in October 2009 and has four components: Building institutional capacity, Water monitoring, Irrigation management and Risk management.

CONTEXT

The Litani River, draining the southern half of Lebanon's Bekaa Valley, is a major source of electricity, agricultural output, and drinking water for the nation. It rises near the ancient city of Baalbeck in the central Bekaa Valley and flows southward before bending sharply west, entering the Mediterranean north of the city of Tyre. The Litani watershed covers an area of 2 160 km², about one-fifth of the country. The estimated population of the Basin in 2010 is 376 000 and is expected to rise to 470 000 by 2020. The Litani River Basin faces three major challenges going forward. These are:

- Seriously polluted ground and surface water that is becoming unfit for some uses;
- Declining groundwater levels; and
- An inadequate supply of water to meet growing demands.

These growing problems are compounded by the inadequacy of current regulatory mechanisms for insuring water quality and for controlling groundwater withdrawals, and the absence of a regular mechanism for allocating and re-allocating surface water supplies. The current allocation of Litani River water was accomplished by national legislation passed in 1970, and there is no on-going mechanism for modifying this fixed allocation.

WATER GOVERNANCE FRAMEWORK

Water governance is the process of making large-scale, policy-level decisions about water. **Water management** is the more routine day-to-day decision making that takes place to implement those broad governance decisions. Responsibility for water governance and management in the LRB is shared among a number of different organizations, such as the Ministries of Energy and Water, Finances, Agriculture and Environment, the Council of Ministers (CoM), the Parliament, the Council for Development and Reconstruction (CDR) and finally the Regional Water Establishment (RWEs) and the Litani River

Authority (LRA). Gaps and redundancies are clearly present, even with the reform initiated by the 2001 Water Law (#221), as well as the lack of coordination mechanisms.

BUILDING EFFECTIVE WATER MANAGEMENT

Going forward there are several possible models for restructuring water management in the LRB, with the preferred model, adopted in many countries and notably in Europe, being a basin-wide authority which, once given a geographic mandate by the government, would act as main water manager in charge of leading the development and regulation of water uses and coordinating the activities of other actors, both at central level (Ministries of Water, Environment, etc.) and at local level (municipalities and Water User Entities). The Litani River Authority is an opportunity to develop such a vision of the future of the LRB. The new way of thinking is to look beyond the original role of the LRA as a construction and development agency and envision an agency that not only develops water resources but also protects and regulates them, while reliably delivering bulk water supplies to the hydropower system and RWEs and high quality irrigation services to farmers.

REFORM PROCESS

The reform process begins with the formulation of a widely-shared vision of the Litani River Basin of the future and a revised and updated mandate for the LRA, along with matching changes in its powers and authorities. The LRA must develop a business plan to assess its financial future and plan for balancing its budgets in the years ahead. It must revisit its organizational structure and revise its staffing pattern, expanding selected units to meet new needs. It must then build human and organizational capacity to manage through new hiring, staff training, and dynamic leadership.

Finally, and importantly, it must begin developing now a River Basin Management Plan (RBMP) built around present and projected future water budgets to provide a sound basis for decision-making. This River Basin Management Plan would consolidate the results of the strategic vision and planning activities into plans for specific activities that address the looming water management challenges. It would serve to guide the LRA its staff, and the other main stakeholder entities, in working to achieve the envisioned future.

Achieving the needed reform is not an easy or a simple process. However now it the correct time to begin. The rewards are large and the cost of failure, or inaction, is high.

ملخص تنفيذي

الخلفيّة

برنامج "دعم إدارة حوض الليطاني" هو برنامج مدته أربع سنوات وهدفه تحسين إدارة المياه في حوض نهر الليطاني في البقاع. وقد التزمت تنفيذه شركة "آي. آر.حي." IRG بالتعاون مع "المصلحة الوطنيّة لنهر الليطاني"، وموّلته "الوكالة الأمريكيّة للتنمية الدوليّة" USAID. باشر البرنامج عمله في تشرين الأوّل سنة ٢٠٠٩ ويتألّف من أربعة عناصر وهي: بناء قدرات مؤسّسيّة، ومراقبة نوعية المياه، وإدارة الريّ وإدارة المخاطر.

الأوضاع الحاليّة

يجمّع نهر الليطاني مياه الجزء الجنوبي من منخفض البقاع، ويشكل مصدرًا مهمًّا لتوليد الطاقة الكهرمائيّة، والإنتاج الزراعي وتأمين مياه الشرب على المستوى الوطني. يقع منبع نهر الليطاني قرب مدينة بعلبك التاريخيّة في البقاع الأوسط، وتجري مياهه جنوبًا قبل أن ينحرف بشكلٍ حادٍ إلى الغرب، ليصبّ في البحر الأبيض المتوسط، إلى الشمال من مدينة صور.

تبلغ مساحة حوض الليطاني الصبّاب ٢١٦٠ كلم^{٢} أي ما يعادل خمس مساحة البلاد. ويقدّر عدد السكان المقيمين في الحوض سنة ٢٠١٠ بـــ ٣٧٦,٠٠٠ مواطن ومن المتوقع أن يرتفع هذا العدد إلى ٤٧٠,٠٠٠ مواطن بحلول سنة ٢٠٢٠.

ويواجه حوض نهر الليطاني مشكلاتٍ ثلاثة وهي:

- تلوّثًا خطيرًا للمياه السطحيّة والجوفيّة يؤدّي إلى جعلها غير صالحة لعددٍ من الإستعمالات؛
- إنخفاضًا في مستوى المياه الجوفيّة؛
- عدم قدرة مشاريع المياه على سدّ الحاجات المتزايدة إليها.

وتتفاقم هذه المشاكل بسبب عدم مناسبة الآليات التنظيميّة الحاليّة لضمان جودة المياه، والتحكم في كميّات المياه المسحوبة من الطبقات الجوفيّة، وعدم وجود آليّة منتظمة لتوزيع وتخصيص وإعادة تخصيص المياه السطحيّة لمختلف المشاريع. وقد تمّ توزيع مياه نهر الليطاني بموجب نصٍ قانونيٍ صدر سنة ١٩٧٠ إنما هذا النص لا يتضمّن أيّ آلية لتعديل التوزيع المذكور.

إطار الإدارة الحكيمة للمياه (الحوكمة)

الإدارة الحكيمة للمياه، هي الطريقة المعتمدة لاتخاذ القرارات الكبرى المتعلقة بالسياسات المائيّة. أمّا إدارة المياه، فتقتصر على القرارات اليوميّة الروتينيّة، المفروض إتخاذها لتنفيذ القرارات الكبرى المتعلقة بالإدارة الحكيمة للمياه. وتتوزع مهامّ الإدارة الحكيمة للمياه وإدارة المياه في حوض الليطاني بين عددٍ من الإدارات، والمؤسّسات: كوزارة الطاقة والمياه، والماليّة، والزراعة، والبيئة، ومجلس الوزراء، ومجلس النواب، ومجلس الإنماء والإعمار، ومؤسّسة مياه البقاع لتصل بالنهاية إلى المصلحة الوطنيّة لنهر الليطاني.

وتتضمن هذه النصوص الكثير من الثغرات والتكرار حتى في إصلاح وإعادة تنظيم قطاع المياه التي باشر بتناولها القانون ٢٢١ سنة ٢٠٠١، كما وإنّ القانون المذكور وتعديلاته تفتقد آليات التنسيق فيما بين مختلف الإطراف.

بناء إدارة مياه ذات فعاليّة

هناك نماذج عدة لإعادة تنظيم إدارة المياه في حوض نهر الليطاني ، والنموذج الأفضل هو الذي اعتمدته بعض الدول ولا سيّما الأوروبيّة منها، وهو يتضمّن سلطة فوّضت الدولة إليها إدارة حوضٍ جغرافيٍ، وتعمل كإدارة مياه رئيسيّة، أوكل إليها إنماء وتنظيم استعمالات المياه، وتنسيق النشاطات مع بقيّة العاملين في الحوض، سواءً على المستوى المركزي (كوزارات المياه والبيئة وغيرها ...) أو على المستوى المحلّي (كالبلديات ومنظمات مستعملي المياه الخ...). وتمثل المصلحة الوطنيّة لنهر الليطاني الحلّ الأمثل لتنفيذ الرؤية المستقبلية هذه لحوض الليطاني. والمقصود بهذه النظرة الجديدة هو التفكير بدورٍ أبعد من الدور الأساسي الذي رسم للمصلحة المذكورة أي كوكالة إنشاء وإنماء، لا تنمّي الموارد المائيّة فحسب بل تعمل أيضًا على حمايتها وتنظيمها، بينما تورّد المياه بالجملة وبطريقةٍ مستدامة، لمنظومات إنتاج الطاقة الكهرمائيّة، ومؤسّسات مياه الشرب، ومشاريع الريّ الحديثة للمزارعين.

آليّة الإصلاحات

تبدأ آليّة الإصلاحات بصياغة رؤية تشارك فيها نسبة واسعة من المهتمين بالمياه في حوض نهر الليطاني للمهام المحدثة والمستقبليّة التي ستوكل إلى المصلحة الوطنيّة لنهر الليطاني وبالوقت ذاته رؤية جديدة للتعديلات في صلاحياتها وسلطتها. كما أنّه على المصلحة المذكورة أن تضع مخطط لأعمالها (business plan) لتتمكن من تحديد مستقبلها المالي ووضع خططها لتأمين توازنها المالي في السنين القادمة، فضلا عن أنّ عليها مراجعة هيكليتها التنظيميّة، وترتيب دوائرها، بشكلٍ توسع فيه دوائرٌ معينة، لتكون قادرةً على مواجهة الحاجات الجديدة، ومن الضروري بناء القدرات البشريّة والتنظيميّة للإدارة باعتماد تعيينات جديدة، وتدريبات للمستخدمين، إضافة إلى تزويدها بقيادة ديناميكيّة.

وبالنهاية، من المهمّ المباشرة بوضع مخطط إدارة لحوض النهر مبني حول توازنات مائيّة حاليّة ومستقبليّة، تؤمّن أساسًا متينًا لاتخاذ القرارات. وسيتكفل مخطط إدارة حوض النهر باعتماد نتائج الرؤية الإستراتيجيّة، والنشاطات التخطيطيّة التي يفترض تطبيقها في نشاطاتٍ معيّنة تخصّص لمواجهة التحدّيات التي تعترض مسار الإدارة المائيّة. وسيشكل المخطط المذكور دليلا للمصلحة الوطنيّة لنهر الليطاني ومستخدميها وغيرهم من المهتمين بالموضوع، للعمل على تنفيذ الرؤية المستقبليّة التي حلموا بها.

لا يعتبر إنجاز الإصلاحات المطلوبة سهلا وهو ليس بالعمليّة البسيطة، إنّما اليوم هو الوقت المناسب للبدء بها. ولا شك أنّ حسناتها كبيرة بينما كلفة الفشل وعدم الحراك عالية.

1. INTRODUCTION

1.1. AUTHORIZATION

International Resources Group (IRG) was contracted by USAID/Lebanon (Contract EPP-I-00-04-00024-00 Task Order No. 7) under the Integrated Water and Coastal Resources Management Indefinite Quantity Contract (IQC) II to implement the Litani River Basin Management Support (LRBMS) Program. The period for performance of the contract is September 29, 2009 to September 30, 2013.

1.2. PROGRAM OBJECTIVES

The purpose of the LRBMS Program is to set the ground for improved, more efficient and sustainable basin management at the Litani river basin through provision of technical support to the Litani River Authority and implementation of limited small scale infrastructure activities.

The LRBMS program is part of USAID's increasing support for the water sector in Lebanon. The Litani River Basin suffers the fate of many river basins around the world: increasing demands compete for limited natural resources. Groundwater over-exploitation, deforestation and overgrazing, unplanned urban sprawl, untreated wastewater effluents, and unsustainable agricultural practices contribute to environmental degradation in the form of declining water and soil quality.

Solutions do exist to reverse these trends and establish sustainable management practices. The key to successfully implement such solutions requires applying the principles of Integrated Water Resources Management (IWRM) through a single river basin authority rather than multiple agencies responsible for different aspects of water management as is the case in many countries. Fortunately, the existence of the Litani River Authority (LRA) provides a unique platform to become such an IWRM river basin authority that will mobilize stakeholders in the river basin and address these challenges in an integrated manner.

Successful implementation of LRBMS will prepare the LRA to assume the role of an integrated river basin authority upon the removal of the present legal constraints.

1.3. PROGRAM COMPONENTS

LRBMS works with national and regional institutions and stakeholders to set the ground for improved, more efficient and sustainable basin management at the Litani River basin. The LRBMS technical assistance team provides technical services and related resources to LRA in order to improve their planning and operational performance and equip them with the necessary resources for improved river basin management.

To achieve the program objectives, LRBMS undertakes activities grouped under the following four components:

1) Building Capacity of LRA towards Integrated River Basin Management

2) Long Term Water Monitoring of the Litani River

3) Integrated Irrigation Management with two sub-components:

    a. Participatory Agriculture Extension Program: implemented under a Pilot Area: West

       Bekaa Irrigation Management Project

    b. Machghara Plain Irrigation Plan

4) Risk Management which with two sub-components:

    a. Qaraoun Dam Monitoring System

    b. Litani River Flood Management Model

1.4. PURPOSE AND CONTENT OF THE REPORT

The purpose of this report is to describe the current multi-actor organizational set-up for water resource governance and management in the Litani River Basin (LRB); to assess the current mandate, structure, and functional coverage of the Litani River Authority (LRA); and to outline a revised institutional architecture for water management in the LRB. This draft serves to document the context and institutional landscape in which the LRB operates and outline a process for organizational reform, suggesting some possible elements of a new structure. It is intended to be a basis for discussion and must be modified and elaborated with the active involvement of LRA and MEW decision-makers and other stakeholders.

2. STRUCTURE OF WATER MANAGEMENT IN LEBANON

2.1. TRADITIONS

Water in Lebanon has long been considered and regulated as a public good. Documents as early as 1733 describe water regulations in the area under the Chehab princes (Catafago, 2005). After the First World War the French governors issued a number of orders regulating water, beginning in 1925 and 1926, some of which are still in effect. Following independence in 1943, a plethora of new laws and decrees were issued in a changing regulatory environment.

At the same time, there exists a long tradition of private concessions for water development and service provision. In 1870, an Ottoman edict granted a 40-year concession to supply potable water to Beirut to a French engineer. The concession was sold to a British firm in 1876 which created the Water Company of Beirut. In 1909, the concession passed to Elias and Ibrahim Sabbagh where it remained until 1949.

In the early 1950s, the Lebanese Government began to buy up water concessions and establish autonomous water authorities to supply potable water to cities and towns. By the end of 1995 there were 21 autonomous water authorities and around 220 commissions and projects managing potable and irrigation water (Catafago, 2005).

These two traditions – (a) water as a public trust subject to state management and (b) private or semi-autonomous public authorities as concessionaires delivering water services – form the foundation for water governance and management in Lebanon.

2.2. MAJOR ACTORS

2.2.1. MINISTRY OF ELECTRICITY AND WATER (MEW)

Before independence, the Bureau of Hydraulics, later to become the Department of Hydraulics, was in charge of water resources under the French High Commissioner. After independence in

1943 the Department was promoted to the rank of a General Directorate (GD) within the Ministry of Public Works. It subsequently became the General Directorate of Hydraulic and Electrical Affairs. In 1966, it became the Ministry of Hydraulic and Electric Resources[1].
The ministry's main duties involved (a) developing hydraulic and electric projects across the country, (2) overseeing the operation of autonomous authorities and concessionaires operating water and energy projects, and (3) enforcing rules related to the protection and use of public waters and the operation of mines and quarries (Catafago, 2005). Additional responsibilities included (4) operating large hydraulic facilities, (5) conserving and controlling the nation's water resources, and (6) studying the supply of and demand for water in the country.
To implement these duties, two general directorates were created within the ministry.

- The **General Directorate of Hydraulic and Electric Equipment**, the larger of the two GDs, is concerned with planning, study, and execution of large-scale hydraulic and electric projects; and enforcement of rules concerning protection of public waters and drainage of rain and wastewater
- The **General Directorate of Exploitation** conducts administrative tutelage over public authorities and concessionaire companies providing water and electrical services and other companies as directed by the Council of Ministers. It also provides technical advice about proposed quarry operations before permits are granted by the Ministry of the Interior.

An organizational chart of the Ministry prior to the reorganization of 2000 is shown in Figure 1.
In 2000, the General Directorate of Petroleum was incorporated into the Ministry, which was renamed the Ministry of Energy and Water[2]. In 2007, MEW had about 212 staff, including 60 engineers, against 578 positions (Comair, 2007). Because of a government ban on recruitment by the public sector, the average age of the MEW staff is quite high. MEW's annual budget is around US$ 85 million, and irrigation represents about 10% of the total.

[1] Law 20 dated 29 March 1966.

[2] Law 247 dated 7 August 2000.

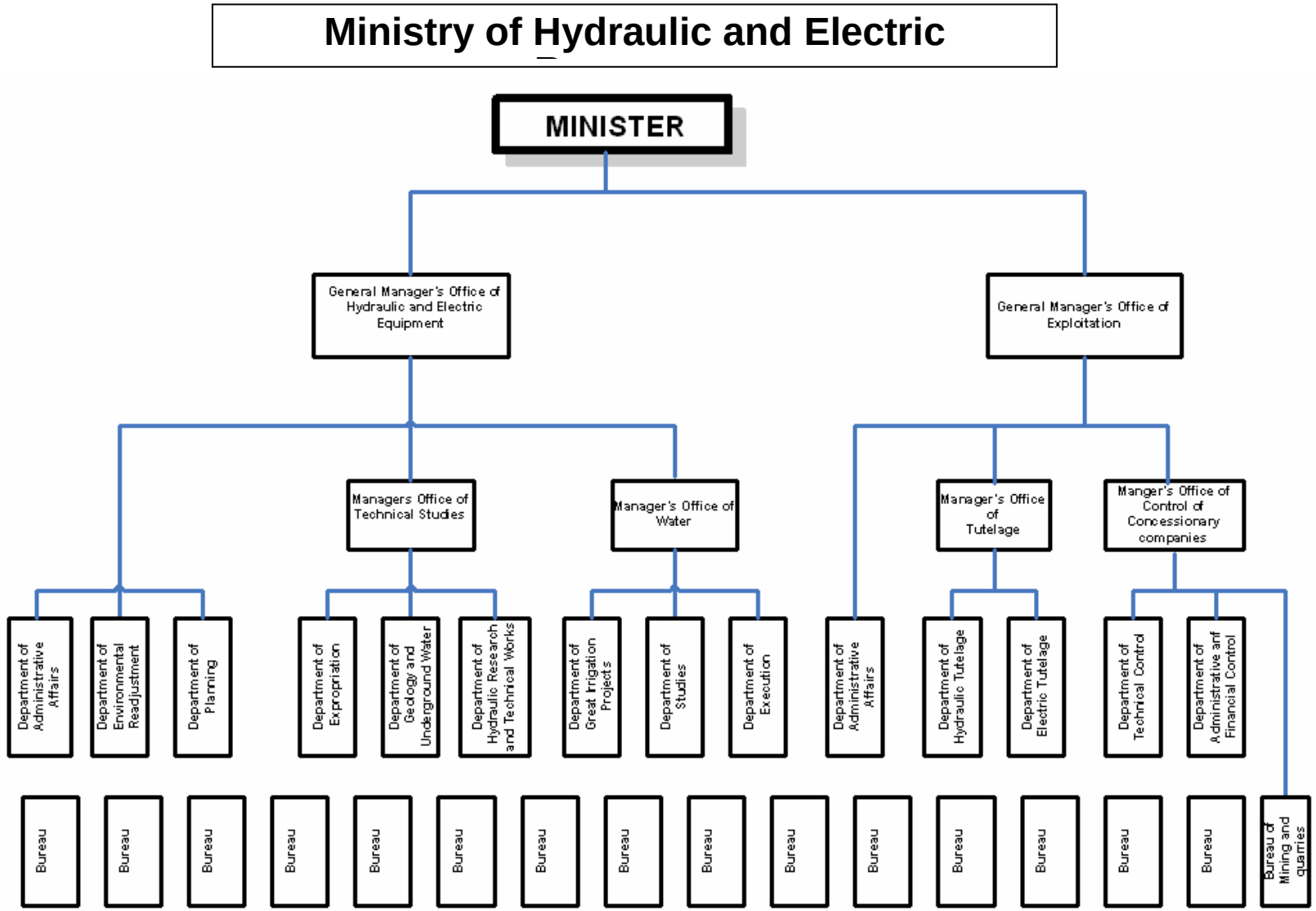

Figure 1. Organizational structure of the Ministry of Hydraulic and electric Resources prior to the 2000 restructuring (source: Catafago, 2005)

2.2.2. LITANI RIVER AUTHORITY (LRA)

The Litani River Authority (LRA) was established in 1954[3]. It was originally established as a project implementation authority. Its purpose, according to the establishing legislation, was to:

1. execute irrigation, drainage, and potable water projects on the Litani River
2. create a transmission network linking the major generating facilities in the country
3. create a nation-wide electrical distribution network

The original program of work for the LRA was based on studies done with the assistance of the US Bureau of Reclamation (USBR) under the United States' "Point 4 Program"[4]. The USBR spent three years studying the Litani River Basin and in 1954 produced a six volume study of water resource development opportunities in the basin which included Qaroun Dam and the three-station Markaba power cascade[5]. The work on this phase of the plan was completed in 1964.

LRA Mandate Related to USBR Study

"The execution of the Litani Basin project for irrigation, drainage, domestic water supplies and electricity within a general management planning of the Lebanese water resources, with respect to the studies and researches made by the United

In 1996, a presidential decree[6] expanded the LRA's mandate to include responsibility for planning and studies for new irrigation schemes in the Litani River Basin and made all irrigation projects, both large and small, in South Lebanon the responsibility of the LRA.

Other responsibilities have been added to the LRA's workplan over the years, typically by delegation by the MEW rather than by formal legislation. These include the following.

- Surface water flow monitoring across the country
- Water quality monitoring in the Litani Basin

2.2.3. REGIONAL WATER AND WASTEWATER ESTABLISHMENTS (RWE)

Regional Water and Wastewater Establishments are responsible for providing domestic water service and wastewater disposal services. There are four of these, covering the entire geographic area of the nation. They are responsible for both construction and operation of the water and wastewater systems in their jurisdiction. In addition they have responsibility for irrigation service

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[3] Law 14 dated 14 August 1954.

[4] "Point 4" was the US foreign economic assistance program initiated by President Truman after the Second World War and was the predecessor to USAID.

[5] USBR. 1954. Development Plan for the Litani River Basin. June.

[6] Decree 9631 dated 13 December 1996.

provision everywhere but within the LRB and in South Lebanon, where the LRA has this responsibility.

The four RWEs were created in 2000[7] through a consolidation of 21 existing potable water authorities and committees. Some are not yet fully operational and in some cases water services continue to be provided by the pre-existing authorities and committees.

2.2.4. LOCAL POTABLE WATER AND IRRIGATION COMMITTEES

Local water and irrigation committees were developed across the nation following the unrest of the 1980s. Of the 209 registered committees nationwide, 154, or roughly three-quarters, had some responsibility for irrigation water supply, either by itself or together with potable water supply. Comair (2007) identifies 25 of these that were operating efficiently and that could form the nucleus of a new Water User Association (WUA).

Of these 154 local committees, 16 lie in districts (caza) completely within the LRB and another 20 are in districts that are partially within the Basin. Thus there are perhaps 20 to 30 irrigation schemes that are managed by local irrigation committees in the LRB[8] and under the guidance of the LRA.

2.2.5. MINISTRY OF ENVIRONMENT (MOE)

The Ministry of the Environment has a nominal mandate to protect the environment in the LRB and throughout the country. In practice, the MoE has little effective authority and, with respect to in-stream and ground water quality, the MEW acts as the responsible entity.

2.2.6. MINISTRY OF FINANCE (MOF)

The MoF reviews and adjusts the LRA's annual budget and sets fees to be charged for services.

2.2.7. COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (CDR)

The CDR was established in 1977 to fast-track investment intended to repair the destruction caused during the early years of the Lebanese civil war[9]. It was made directly accountable to the Council of Ministers through the Prime Minister[10]. It persists as the link between external donors and large-scale infrastructure development projects in Lebanon. Its mandate is three-

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[7] Law 221 dated 29 May 2000.

[8] Although these committees were formally abolished in 2005, most if not all still operate in the absence of management by the Regional Water Authorities or the LRA.

[9] Decree 5 dated 31 January 1977.

[10] In part because the Planning Ministry had ceased to exist.

fold. (a) planning for infrastructure development, (b) mobilizing funding for major development projects, and (c) supervising project execution (CDR, 2010).

2.3. YEAR 2000 SECTOR REFORM

In 2000 a new law[11] was passed dramatically restructuring the water sector in the county by consolidating the 21existing local water supply authorities into 4 new regional authorities. In that same year, separate legislation combined the functions of the Ministry of Petroleum with those of the restructured MEW into a single ministry. The role of the LRA was explicitly left unchanged in this legislatively-mandated restructuring. In 2005, implementing regulations for the new law were issued by the Ministry. Since that time, progress in establishing functioning RWEs and in reorganizing the MEW has been limited and the reforms remain incomplete.

Although Law 221 was a significant improvement for the delivery of potable water, it failed to clarify the roles and responsibilities for water management. The permitting and control of water withdrawals and effluent releases is for example unclearly assigned and consequently quite absent in Lebanon.

Timeline of Selected Events

1954	Litani River Authority (LRA) established
1966	Ministry of Hydraulic and Energy Resources (MOHER) established
1970	Litani waters allocated by Decree 14522
1977	Council for Development and Reconstruction (CDR) established
2000	General Directorate of Petroleum folded into MEW
2000	Water sector restructured (Law 221)
2000	Regional Water and Wastewater Enterprises (RWEs) established
2005	Implementing regulations for sector restructuring issued

2.4. COORDINATION

In 1972, a decree[12] created the Higher Council for Water, but this council has never operated. Otherwise coordination appears to be informal and sporadic.

[11] Law 221 dated 29 May 2000. This law was corrected by Law 241 dated 7 August 2000 and amended by Law 377, dated 14 December 2001.

[12] Decree 4537 dated 15 December 1972.

3. WATER RESOURCE GOVERNANCE FOR THE LITANI RIVER BASIN

3.1. INTRODUCTION TO THE LITANI RIVER BASIN

The Litani River, draining the southern half of Lebanon's Bekaa Valley, is a major source of electricity, agricultural output, and drinking water for the nation. It rises near the ancient city of Baalbeck in the central Bekaa Valley and flows southward for 100 km or so before bending sharply west, entering the Mediterranean at Kasmieh just north of the city of Tyre. The Litani watershed covers an area of 2 160 km^2, about one-fifth of the country.

Agricultural land makes up 45% of the basin, most of it located in the valley bottom and rainfed, while natural vegetation, mostly brush and Mediterranean small trees in the uplands, covers 48%, and urban areas about 3%. The Litani River Basin (LRB) contains several cities and towns and some 263 villages. The estimated population of the Basin in 2010 is 376 000 and is expected to rise to 470 000 by 2020. About 31% of household income in the Basin is derived from agriculture (MENBO, 2007).

The LRB contains two important wetlands and a large forest reserve. The Bekaa Valley, much of which lies in the LRB, is considered a important biological corridor, particularly significant for migrating bird species traveling between Africa and Europe.

The Litani contains one major storage dam, completed in 1964 (Catafago, 2005), with a storage capacity of 220 MCM. The average annual runoff into the river above Qaroun dam historically was about 450 MCM. However, in recent years, because of expanded upstream surface water use and extensive groundwater mining which reduces spring flow, the average annual inflow to the Litani has declined to around 250 MCM. The river's linked surface-ground water system currently irrigates about 20 000 hectares of land, with another 30,000 hectares of (rainfed) winter crops. A three-station hydropower cascade utilizing Litani water produces about 10% of the nation's power supply.

Detailed and reliable data related to underground water in the LRB is not available. MENBO (2007) indicates that there are 12 separate aquifers in the Basin and cites a MEW study from 2003 which estimates that annual groundwater recharge in the LRB at only 81% of the sum of annual outflow and withdrawals. Most of the deep aquifer wells in the Basin are private and are unrecorded. One recent estimate suggests the existence of around 4 000 wells in the plain and 3 000 wells in the coastal part of the basin (MENBO 2007).

The Litani River Basin thus faces three major challenges going forward. These are:

- Seriously polluted ground and surface water that is becoming unfit for some uses
- Declining groundwater levels
- An inadequate supply of water to meet growing demands

These growing problems are compounded by the inadequacy of current regulatory mechanisms for insuring water quality and for controlling groundwater withdrawals, and the absence of a regular mechanism for allocating and re-allocating surface water supplies. The current allocation of Litani River water was accomplished by national legislation passed in 1970, and there is no on-going mechanism for modifying this fixed allocation.

3.2. CURRENT WATER GOVERNANCE FRAMEWORK

Water governance is the process of making large-scale, policy-level decisions about water. **Water management** is the more routine day-to-day decision making that takes place to implement those broad governance decisions. Responsibility for water governance and management in the LRB is shared among a number of different organizations. Governance decision-making, in particular, is diversified and decentralized. TBD

To understand where governance decision-making responsibilities lay, we conducted an *Organizations and Functions Matrix* exercise. The first step in the exercise was to list the important actors involved in making water governance decisions. These were put into a matrix crossed with the five standard functions of water governance (Svendsen, 2009). Five experienced water resource professionals familiar with the Lebanese water sector were asked to rate the degree of influence that the various organizations in the list had on decisions related to the five standard functions on a scale of

INFLUENCE SCORING	
1	No Influence
2	Minimal influence
3	Moderate influence
4	High influence
5	Very high influence
NA	No answer/don't know

1 to 5. The meaning of each value is shown in the box at the right. After all of the informants completed the exercise, the scores in each cell were averaged and then combined into the five major standard function headings. The results are shown in Table 1.

The first function, *Organizing and Building Capacity in the Water Sector* was influenced most strongly by the MEW and the Council of Ministers (CoM), with the LRA, Parliament, and the RWEs also playing important roles. The Ministry of Finance (MoF) exerted its strongest influence here, but it was not as important as several other actors.

The second function, *Planning Strategically*, was most strongly influenced by the MEW and the LRA, with Regional Water Establishments (RWEs) and the Council for Development and Reconstruction (CDR) also playing influential roles.

The third function, *Allocating Water*, was driven by the MEW, the CoM and Parliament. This perception fits the fact that large-scale water allocation in Lebanon is accomplished by *ad hoc* Presidential Decree in the absence of any systematic framework for awarding water rights and transferring them among users.

The fourth function, *Developing and Managing Water Resources*, is also dominated by MEW and LRA.

Table 1. Organizations and Functions Matrix for the Litani River Basin

Standard Functions	Organizations														
	PARLIAMENT	COUNCIL OF MINISTERS	MINISTRY OF ENERGY & WATER	MINISTRY OF FINANCE	MINISTRY OF ENVIRONMENT	MINISTRY OF AGRICULTURE	MINISTRY OF PUBLIC HEALTH	REGIONAL WATER ENTITIES	MUNICIPALITIES	CDR	LRA	METEOROLOGICAL DEPARTMENT	FARMERS &WATER USERS COMMITTEE	MINISTRY OF INTERIOR	LIBNOR
1. ORGANIZING & BUILDING CAPACITY IN THE WATER SECTOR	2.7	3.6	4.0	2.3	1.8	1.9	1.6	2.6	1.2	1.9	2.8	1.2	1.3	1.7	1.1
2. PLANNING STRATEGICALLY	1.5	2.2	3.9	1.3	1.9	2.5	1.5	3.0	1.5	2.8	3.2	1.6	1.1	2.1	1.5
3. ALLOCATING WATER	2.5	3.6	3.7	1.6	1.7	2.2	1.6	2.0	1.8	1.4	2.3	1.0	1.4	2.0	1.0
4. DEVELOPING AND MANAGING WATER RESOURCES	1.6	2.3	3.4	2.1	1.4	2.2	1.2	2.8	1.8	2.4	3.0	1.0	1.1	2.7	1.0
5. REGULATING WATER RESOURCES AND SERVICES	2.0	2.9	3.1	1.9	2.7	2.1	2.2	2.3	1.8	1.4	2.0	1.1	1.0	3.0	1.4

CDR is seen as playing a surprisingly small role in this, which may be because they often have a significant role in development, but none in management. The Ministry of Interior (MoI) was also seen as having a significant role here, perhaps for its legal enforcement powers.

For the final function, *Regulating Water Resources and Services*, MEW and the MoI are seen as the most important decision makers. This is because MEW generally has primary responsibility for regulation, while MoI has enforcement powers, through its control of the police. LRA is not currently seen as an important player. The Council of Ministers (CoM) is also seen as influential

here, perhaps because decisions of significance are often referred by MEW to the CoM for confirmation.

In terms of the organizations, several things stand out. One, perhaps unsurprisingly, is that MEW is the most important influence on decisions in all 5 functional areas. This is generally appropriate, as top level water governance functions are typically the province of the national government. Another is the strong role that the RWEs are seen to be playing, even though none are fully functional at this point. The strong ratings appear to reflect the potential influence seen for these regional water managers rather than their current effectiveness. A third thing that stands out is the mid-level importance of the Ministry of Agriculture (MoA) in 4 of the 5 functional areas. The reason for this is not clear. Another interesting observation is that the CoM is more influential in every case than Parliament. This speaks to the relative importance of the executive branch of government here, as does the fact that the courts did not make it onto the list of important water-related organizations suggested by local informants. The role on the Ministry of Finance may be underestimated here, as it approves plans and budgets of all public water agencies – clearly a very influential role.

3.3. POSSIBLE WATER GOVERNANCE MODELS

Going forward there are several possible models for restructuring water management in the LRB:

- One model would attempt to have the MEW exercise the water management functions that it is, by default, responsible for. The lack of staff, capacity and presence in the Bekaa, would make this approach long in the making. Merging the LRA with the MEW, as has been somewhat contemplated, could solve that issue but would run into serious administrative issues (notably regarding status and benefits of LRA staff). Moreover having the MEW directly managing water resources in the field would fall into the too common trap of centralized bureaucracy, with even mundane decisions being elevated to high officials, and thus being either ignored, much delayed, or taken without field knowledge. It would moreover run contrary to the process initiated by Law 221 which seeks to promote financial and administrative autonomy for Water Establishments.
- The second model is one in which several organizations share responsibility for various aspects of water management, but with strong, effective coordinating mechanisms harmonizing the activities of the different actors. Given the plethora of organizations currently involved in basin water management, implementing the second model would

be most politically expedient. However, the current situation is largely dysfunctional and adopting the coordinated model cannot mean simply continuing the status quo.

- Finally one model, adapted in many countries and notably in Europe, would comprise a basin-wide authority which, once given a geographic mandate by the government, act as main water manager in charge of leading the development and regulation of water uses and coordinating the activities of other actors, both at central level (Ministries of Water, Environment, etc.) and at local level (municipalities and Water User Entities). **The Litani River Authority, quite uniquely in the Middle-East, is an ideal candidate for this role as it already has a geographic mandate, qualified staff with presence in the field, and is already responsible for water monitoring functions.**

3.4. PROPOSED WATER GOVERNANCE FRAMEWORK

The government, either though ministerial decree or legislative action, would have to assign a clear leadership role to the LRA, and delegate the necessary decision-making authority to carry it out. In addition, the relationships among the various actors in the basin, including basin residents in general and water users in particular, would have to be more explicitly spelled out and coordination mechanisms; such as memoranda of understanding, binding contracts, and regular consultations and cross-organization meetings; put in place.

In general several key roles can be recognized for governing and managing the water resources of a river basin. The government, through a line ministry, generally takes responsibility for setting overall policy and direction for river basin development and management. A basin authority then takes the lead in planning developing, managing, and protecting the waters of the basin. It may not carry out all of the tasks involved itself, but it generally takes the lead in planning, organizing, and coordinating to insure that plans are implemented as intended. Separate enterprises, or establishments, are then chartered to provide water services within the basin. Services can include domestic water supply and waste water treatment, irrigation service, water supply for hydropower generation and so on. Typically these enterprises are separate entities, operate on business principles, and are expected to be self-financing.

The basin authority may also regulate water use, service delivery, water quality, protection of the water environment, and so on within the basin, or another agency may carry out these functions under the coordination of the Basin Authority. Clearly numerous roles are involved in basin water management, and clear specification of these roles, along with explicit mechanisms and processes for coordination, are necessary for effective management.

4. BUILDING EFFECTIVE WATER MANAGEMENT FOR THE LITANI

4.1. LRA MANDATE

4.1.1. CURRENT

As mentioned under 2.2.2, the LRA does not currently have a clear formal statement of its mission. Upon its founding in 1954, the primary mission given to it in its establishing legislation was to implement the Basin Development Plan prepared by the USBR by constructing projects related to water storage, hydropower, and electricity transmission. Subsequently were added responsibilities for planning and studies for new irrigation schemes in South Lebanon. Other responsibilities have been added to the LRA's workplan over the years, typically by delegation by the MEW rather than by formal legislation. These include the following.

- Surface water flow monitoring across the country
- Water quality monitoring in the Litani Basin

In its *Master Plan* of 2003, the LRA reflects its own understanding of its mission and responsibilities. In this document it discusses its priority role in (1) irrigation development, (2) drinking water supply, and (3) hydropower production. It also indicates priorities of (4) preserving and protecting water resources within the LRB and (5) preserving the environment and landscape of the LRB. This suggests a mandate for the Authority that extends beyond simply building and operating hydraulic facilities. Additional support for a broader mandate is contained in the draft revised organizational chart for the LRA, which has been under review by the Minister of Energy and Water for some time. This revised organizational chart explicitly includes an Environmental Bureau within the Water Resources Department.

4.1.2. PROPOSED MANDATE

The LRA would be challenged to assume new functions in areas such as water quality regulation, groundwater regulation, water allocation, and risk management. Since not all functions can be transferred at once, some priorities are proposed:

Tasks		LRA Functions					
		Resource Development	Service Delivery	Water Quality Regulation	Water Quantity Allocation	Risk Management	Groundwater Regulation
1	Planning		X	B	C	A	B
2	Project design	X				C	
3	Project construction	X				C	
4	Operation and maintenance		X				
5	Compute water balance				A		B
6	Inventory/mapping			B	A	A	B
7	Monitoring		X	X	A	A	A
8	Modeling			B	A	A	B
9	Inspection/analysis					A	
10	Building awareness		A	A		A	B
11	Involving stakeholders/ building partnerships		A	A	B	A	B
12	Permitting			A			B
13	Enforcement			A			B
14	Setting and collecting fees		X	C			C

X: already performing

A: Short-term priority (next 2 years)

B: Mid-term priority (3-5 years)

C: Long-term priority (6-20 years)

4.1.3. SUGGESTED MISSION STATEMENT

It is suggested to draft a concise and explicit mission statement for the Authority that communicates clearly its overall purpose. Such a mission statement could be:

> *"The mission of the Litani River Authority is to develop, manage, and protect the surface and ground waters of the Litani River Basin from the headwaters to the sea."*

A one-page vision based on this mission statement has been accordingly drafted (see Annex I).

4.2. BUDGET

4.2.1. CURRENT

The LRA's revenue in 2008 was around US$ 15.1 million, the great majority of which came from power sales from the three power plants in the Markaba cascade. Most of the remainder was collected in the Qasimiah Irrigation Scheme (Table 2).

Table 2. LRA Revenue, 2008

	Million LBP	Million US $	Share
Power sales	19,599	13.1	86.5%
Qasimiah Irrigation Project	2,039	1.4	9.0%
South Bekaa Irrigation Project	506	0.3	2.2%
Pilot Irrigation Projects	205	0.1	0.9%
Family allowance transfers	269	0.2	1.2%
Miscellaneous revenue	34	0.0	0.2%
	22,652	15.1	100.0%
Source: LRA			

As far as expenditures are concerned, for 2008 regular expenditures totaled about US$ 13.3 million (Table 3), with construction expenditures adding another US$ 2.6 million. Regular expenditures thus constitute 84% of the expenditure total. Three categories make up the majority of the expenditures – salaries and benefits (49%), fuel, consumables, and spares (21%) and works supplies and services (15%). Most of the last category is made up of building and equipment maintenance.

Table 3. LRA Regular Expenditures, 2008

	Million LBP	Million US $	Share
Purchases (fuel, consumables, spares, other)	4,160	2.8	20.8%
Salaries, Allowances, Bonuses, and Benefits	8,778	5.9	43.9%
Taxes and Fees	1	0.0	0.0%
Works, Supplies, and Services	2,925	2.0	14.6%
Transportation Allowances	454	0.3	2.3%
Social Security	1,015	0.7	5.1%
Administrative Expenses	877	0.6	4.4%
Depreciation, End of Service Benefits, and Reserves	1,763	1.2	8.8%
	19,973	13.3	100.0%
Source: LRA			

The bottom line is that LRA covered most of its expenses for the year, but drew on reserves for about US$ 0.8 million or about 5% of its expenditures.

A multi-year perspective on LRA income and expenditure patters in shown in Table 4. It is seen that both income and expenditures can vary considerably from year to year. On the income side, while irrigation income is relatively stable, power revenue varies widely from year to year. On the expense side, both ordinary and construction expenses can change substantially from year to year.

Table 4. LRA Income and Expenditures, 2006-2008

	2006		2007		2008	
	Million LBP	Million US$	Million LBP	Million US$	Million LBP	Million US$
INCOME						
Income from Selling Electric Power	21,600	14.4	25,610	17.1	19,599	13.1
Income from Selling Irrigation Water	2,155	1.4	2,565	1.7	2,750	1.8
Miscellaneous Income	287	0.2	321	0.2	303	0.2
Total Income	24,043	16.0	28,497	19.0	22,651	15.1
EXPENDITURES						
Total Ordinary Expenses	16,415	10.9	12,551	8.4	19,973	13.3
Total Construction Expenses	1,423	0.9	1,610	1.1	3,899	2.6
Total Expenses	17,838	11.9	14,160	9.4	23,872	15.9
NET INCOME	6,205	4.1	14,337	9.6	(1,221)	(0.8)

One sobering note for the future is that with the completion of the South Lebanon Irrigation Project, power revenues to the LRA are likely to fall sharply, as water is diverted away from the power cascade to much less profitable irrigation use in the Canal 800 area.

4.2.2. SUGGESTED

The LRA needs to develop a business plan for itself, which considers current and expected future income and expenditures and lays out a strategy for achieving a balance in these while executing its revised mandate. The business plan should be scenario-based, where alternative future configurations of irrigation development, hydropower production, and domestic and environmental water requirements are considered and the varying financial implications of these alternative scenarios assessed. The business plan should also consider the mix of activities the LRA plans to undertake, distinguishing commercial activities and public trust activities. The former involve supplying water to various users, and hydropower production and should be self-financing. Public trust activities include long-range planning, water quality regulation, environmental protection, regulation of groundwater abstraction and the like. These activities arguably should be financed from general tax revenues, since they benefit a number of clients and stakeholders, and the public at large, simultaneously.

4.3. ORGANIZATIONAL STRUCTURE AND STAFFING

4.3.1. CURRENT

The current structure of the LRA is shown in Figure 2.

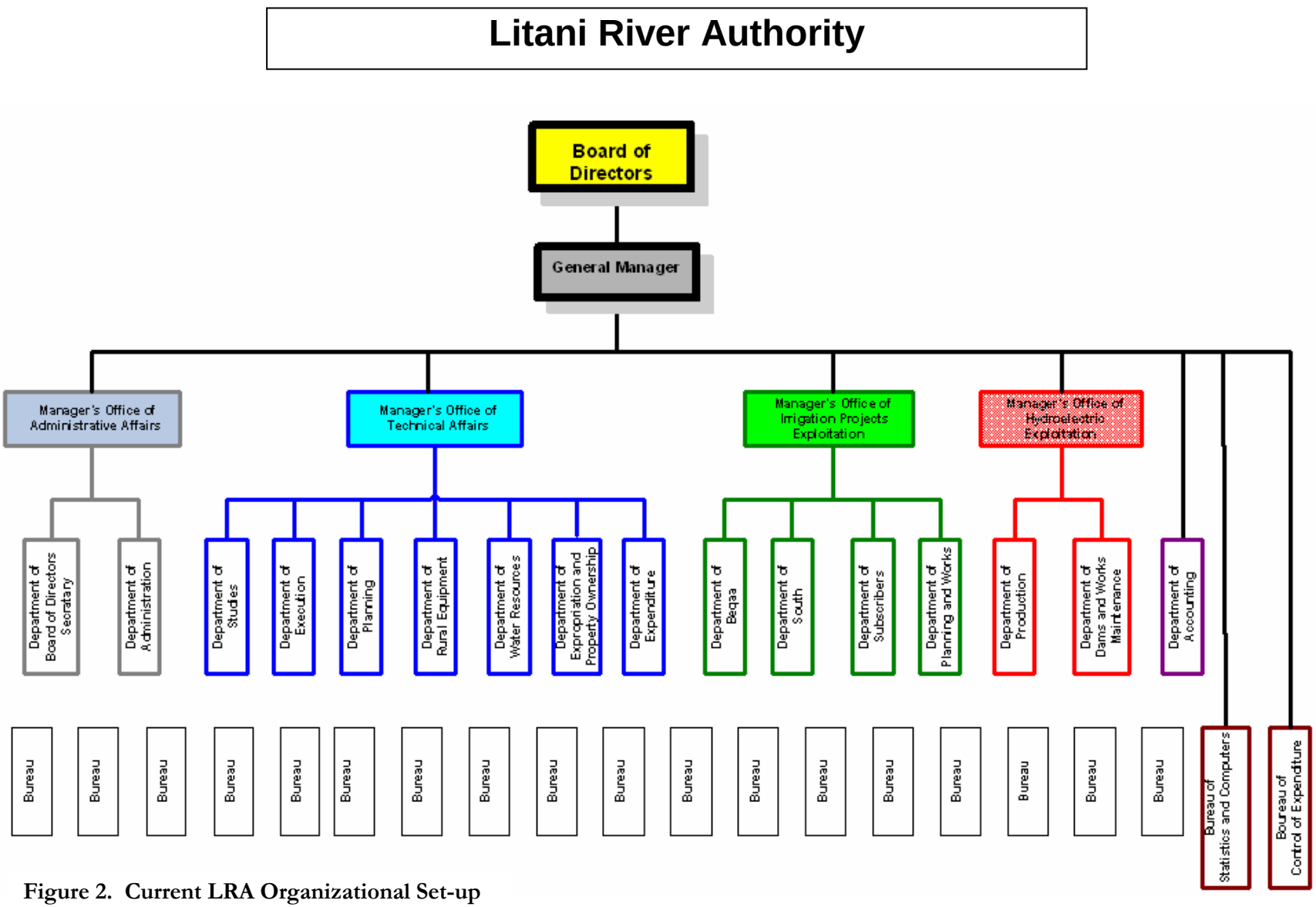


Figure 2. Current LRA Organizational Set-up

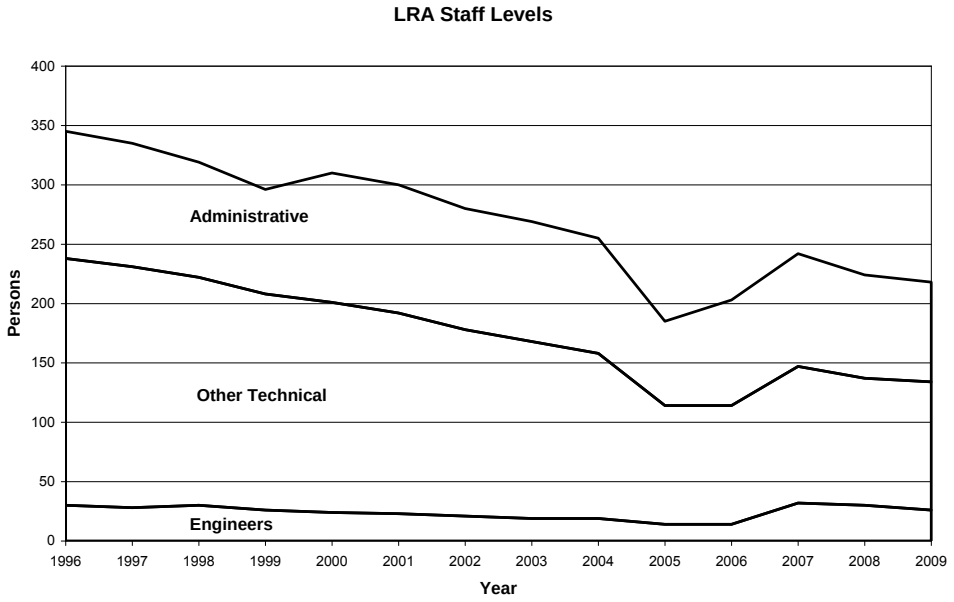
Current staffing levels of the LRA are shown in Table 5.

Table 5. Current LRA staffing levels

	Technical			Administrative			Total		
	Permanent	Contractual	Total	Permanent	Contractual	Total	Permanent	Contractual	Total
Arcache and Helou Plant	42	4	46	0	0	0	42	4	46
Abdel Al Plant	19		19	2	1	3	21	1	22
Production Department	3		3	1	1	2	4	1	5
Expropriation Department	4		4	0	2	2	4	2	6
Rural Development Department	1		1	9	3	12	10	3	13
Water Resources Department	3	1	4	6	8	14	9	9	18
Studies Department	5		5	1	1	2	6	1	7
Administrative Department	7		7	12	19	31	19	19	38
Bidding Department	3		3	0	1	1	3	1	4
South Lebanon Irrigation	26		26	2	13	15	28	13	41
Customer Service	0		0	2	1	3	2	1	3
Technical Department	1		1	0	0	0	1	0	1
Accounting Department	1		1	5	1	6	6	1	7
South Bekaa Irrigation Project	6		6	1	0	1	7	0	7
Total	**121**	**5**	**126**	**41**	**51**	**92**	**162**	**56**	**218**
Source: LRA									

It is noteworthy that more than half of the technical staff (52%) work in the three power plants operated by the LRA, while there are just 4 technical staff in the Water Resources Department and a combined total of 10 (8%) in the Rural Development, Water Resources, and Studies Departments. These are the departments that presumably would carry the bulk of burden in implementing an expanded LRA mandate.

The trend in LRA staffing levels has been downward since at least 1997. Figure 3 shows staffing levels over time from 1997 to 2009. Greatest losses have been in technical staff, which declined as a share of total staff levels from 60% in 1996 to 50% in 2009. Over the same period, the



share of administrative staff increased from 31% to 39% of the total.

Figure 3. LRA staffing levels, 1996-2009

The proposed revised organizational structure envisions a staff compliment of 728, which would represent a dramatic expansion from current levels. It is not clear that such a drastic up-scaling is required, but selected augmentation of key technical staff groups is clearly critical.

4.3.2. PROPOSED

In about 2008, the LRA proposed for itself a revised organizational structure. This proposal was submitted to the Minister of Energy and Water who has approved it. It is now pending endorsement by the Council of Ministers.

The proposal does not represent a radical restructuring of the Authority but is intended, in part, to provide justification for boosting staff numbers from their current low levels. In addition to some reorganization, it does formally add an environmental monitoring unit to the structure, which is a welcome and useful step.

4.3.3. SUGGESTED

In order to address the challenge facing the LRB over the coming 10 to 20 years, the LRA requires additional or strengthened capabilities in the following areas.

- W**ater budgeting and planning** which would document current supply and demand for water in the basin and project expected supply and demand conditions into the future on a regular basis.
- **Data, analysis, and modeling** possibly affiliated with the water budget and planning unit, to store and manage comprehensive information on the water balance and water quality in the Basin. Water balance information would include precipitation, infiltration and runoff, water flows, evaporation and evapotranspiration, withdrawals for all uses and return flows. It would track both surface and ground water. Water quality information would include sampling results from both ground and surface water for important contaminants. It would also model and predict flooding events
- **Groundwater** to monitor groundwater levels, issue well permits and monitor pumping.
- **Water quality** to monitor effluent discharges, and surface and groundwater quality (more significant than the current informal and under-staffed Environmental Unit). This unit would link directly with the Ministry of Environment as well as the Ministry of the Interior and Municipalities to enforce water quality regulations.

- **Client liaison** to communicate with users of water services and other stakeholders, and, in particular, to develop and support farmer-based management units such as local water supply committees and water user associations.

These units could be regrouped under a new Planning, Analysis, and Licensing Office, freeing the existing Technical Affairs Office to focus on technical studies and work supervision.

4.4. RIVER BASIN MANAGEMENT PLAN

Making good decisions about water requires a sound factual basis. A River **Basin Water Balance** is a simple, logical way of consolidating and reporting hydrologic information about the present status of the basin. The River Basin Water Balance links with a River **Basin Management Plan (RBMP***)*, which looks at the expected future status of water supply and demand in the basin and lays out a reasonable pathway to match the two, while achieving envisioned water quality and sustainability standards. A RBMP is an essential prerequisite to any rational decision making process regarding basin water resources.

The RBMP would consolidate the results of the strategic vision and planning activities into plans for specific activities that address the looming water management challenges. It would serve to guide the LRA its staff, and the other main stakeholder entities, in working to achieve the envisioned future.

A RBMP is called for in the new draft water code for Lebanon ("Code de l'Eau") and is a central feature of the European Water Framework Directive (WFD). As defined in the WFD, preparing a RBMP is an elaborate and involved process, and preparing a RBMP for the Litani would no doubt employ a simpler procedure, adapted to the local context. The point, though, is that a RBMP is regarded as a critical and necessary feature of sound basin planning and management in both of these documents.

It is important that preparation of a River Basin Water Balance and a River Basin Management Plan begin at once, so that the results can serve as a basis for making decisions about basin needs and proposed modifications and changes in the set-up for basin governance and management.

4.5. REFORM PROCESS

Reforming the LRA to meet coming challenges is not a simple undertaking, and requires a number of sequenced steps, and extensive consultation, to accomplish. Key steps in the process include the following.

1. Developing a widely-shared long-term vision for the LRB
2. Preparing a clear and concise mission statement for the LRA
3. Updating the legal mandate of the LRA
4. Developing current and projected ground and surface water budgets for the LRB, and identifying key challenges
5. Preparing a river basin management plan to address those challenges over the next 5 to 10 years
6. Reassessing the organizational structure, unit and individual role descriptions, and available skills within the LRA and realigning the structure and staffing pattern with the key challenges faced
7. Preparing and implementing a capacity development plan for the LRA
8. Developing a business management plan for the LRA
9. Regularly monitoring and assessing progress in implementing the reform program, and making needed adjustments

To implement such a reform program, a steering group will be necessary. It is often useful to organize a ministerial-level committee that meets annually or semi-annually to provide top-level direction and coordination for the reform effort and at the same time secure broad awareness of and political backing for the reforms [13]. More routine advice, guidance, and feedback is provided by a lower-level working group that meets on a more frequent basis. The process could be initiated by forming the working-level group, with the establishment of the higher-level body following once initial groundwork had been laid. The working-level group would also be an ideal setting to involve the build the capacity of local actors and leaders such as municipalities and water user representatives (farmers, businesses, etc.).

Since information collection and strategic thinking and planning should precede formal changes in legislation and organizational structures, initial work should be done using existing units and staff, augmented by judicious use of outside consultants. Once directions and plans are clear, internal organizational reforms can proceed.

[13] This ministerial level committee could form the nucleus of a future water resource coordinating council for the country.

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ANNEX - A VISION FOR THE LITANI RIVER BASIN

Water resources are vital for the health and economic development of people and communities in the Litani River Basin (LRB). However the Basin is today facing unprecedented water-related problems. Chief among these are the degraded quality of basin ground and surface water, rapidly declining groundwater tables, and growing demands for limited surface water.

The Litani River Authority (LRA), as the basin water manager, must adapt to respond to these evolving threats. Originally established to develop basin water resources and operate irrigation and hydroelectric facilities, the LRA is now challenged to assume new functions in the areas such as **water quality regulation**, **groundwater regulation**, **strategic planning**, and **risk management**.

In June of 2010, the Ministry of Energy and Water (MEW), with the endorsement of the Council of Ministers, signed a Memorandum of Understanding with USAID to improve the management of the LRB by improving the operations, management, and services of the LRA. In particular, the MOU called for building the capacity of the LRA "towards Integrated River Basin Management (IWRM)".

To build this capacity, the LRA needs to add new functions to its mandate and explore new ways of operating, as it evolves into an entity that manages water resources throughout the water cycle. A new mandate for the LRA might be framed as follows.

> *The mission of the Litani River Authority is to develop, manage, and protect the ground and surface waters of the Litani River Basin, in an integrated way, from the headwaters to the sea.*

This mandate incorporates integrated water resource management as a core principle and implies a focus on sustainability, both of resources and institutions; protection of ecosystems; inclusion of users of water services in decision making; and management of demand in addition to supply development.

Implementing this mission requires structural changes in the LRA, creating new units or adding new functions to existing units. These units, in turn, require new skills through new hiring and reassignment and retraining of existing staff. Ultimately, the legal mandate for the LRA, the core of which is more than 50 years old, will need to be updated.

Even with these essential new capacities, however, the LRA cannot resolve the problems facing the Basin on its own. Issues such as water pollution and inefficient water use result from the independent

actions of many individuals and solving them will require a combination of actions by the LRA and communities, individuals, associations, companies, municipalities, and other government agencies The LRA must also expand its activities in collecting, storing, and processing information into forms supporting sound decision making. These include identifying and mapping current water quality and sources of pollution, monitoring surface and ground water availability, flows, and withdrawals, and recording meteorological conditions. Models projecting future water conditions can be combined with results of current monitoring and a strategy for action into a regularly-updated basin management plan.

رؤية المصلحة الوطنية لنهر الليطاني

تعتبر الموارد المائية ذات اهمية حيوية لصحة السكان والمجتمعات الحالية في حوض نهر الليطاني وتنميتهم اقتصاديا. لكن حوض الليطاني يواجه اليوم مشاكل تتعلق بتلبية المياه لمستقبل [illegible]. واولها تدهور نوعية تربة الحوض ومياهه الجوفية والسطحية والانخفاض الاساسي في منسوب المياه الجوفية والطلب المتزايد على المياه السطحية المحدودة الكمية.

وعلى المصلحة الوطنية لنهر الليطاني، كونها المسؤولة عن ادارة مياه حوض الليطاني، التطور لتكون جاهزة لمواجهة هذه التهديدات. أنشئت المصلحة الوطنية لنهر الليطاني بالاساس، لتنمية الموارد المائية في حوض النهر وتشغيل منشآت الري وتوليد الطاقة الكهرمائية، الا انها اليوم تجد نفسها مضطرة للاضطلاع بمهام جديدة كتنظيم نوعية المياه وتنظيم المياه الجوفية والتخطيط الاستراتيجي وادارة المخاطر.

في حزيران من العام 0202، وقعت وزارة الطاقة والمياه بموافقة مجلس الوزراء، مذكرة تفاهم مع الوكالة الاميركية للتنمية الدولية (USAID) لتحسين ادارة حوض الليطاني من خلال تحسين عمليات التشغيل والادارة والخدمات في المصلحة الوطنية لنهر الليطاني. وعلى وجه الخصوص، دعت مذكرة التفاهم الى بناء قدرات المصلحة تجاه "ادارة متكاملة لحوض نهر الليطاني" من خلال "الادارة المتكاملة للموارد المائية".

ومن اجل بناء هذه القدرات تحتاج المصلحة الوطنية لنهر الليطاني الى اضافة وظائف جديدة الى مهامها ولكشف اساليب جديدة للعمل، لانها تحتاج للتحول الى وحدة تدير الموارد المائية ضمن الدورة الطبيعية للمياه. ويمكن ان تحدد المهام الجديدة للمصلحة الوطنية لنهر الليطاني كما يلي:

> *مهمة المصلحة الوطنية لنهر الليطاني هي تنمية وادارة وحماية المياه الجوفية والسطحية في حوض نهر الليطاني، على نحو متكامل، من المنبع الى المصب.*

تتضمن هذه المهمة ادارة الموارد المائية كنظام اساسي والتركيز على الاستدامة لكل من الموارد والمؤسسات وحماية النظم الايكولوجية واشراك المستفيدين من خدمات المياه في اتخاذ القرارات وادارة الطلب بالاضافة الى تنمية وتوريد المياه.

يتطلب تنفيذ هذه المهمة تغييرات في هيكلية المصلحة الوطنية لنهر الليطاني عبر انشاء وحدات جديدة او اضافة مهام وقدرات وظيفية جديدة الى الوحدات القائمة. وتتطلب هذه الوحدات بدورها، قدرات اكبر ومهارات جديدة من خلال توظيف جديد واعادة توجيه وتدريب الموظفين الحاليين. وبالنتيجة سوف تحتاج مهام المصلحة الوطنية لنهر الليطاني الى تعديل نصوصها لتحسين سن تدخلات الى التحديث.

حتى مع هذه القدرات الاساسية الجديدة، لن تتمكن المصلحة الوطنية لنهر الليطاني من حل المشاكل التي تواجه حوض نهر الليطاني بامكانياتها الذاتية منفردة. فقضايا مثل تلوث المياه واستخدام المياه بشكل غير مجدي هي نتيجة نشاطات متنقلة صادرة عن العديد من الأفراد والجهات سوف يتطلب تضافر جهود تتخذها المصلحة الوطنية لنهر الليطاني والمجتمعات المحلية والأفراد والجمعيات والشركات والبلديات وغيرها من المؤسسات الحكومية.

ويجب على المصلحة الوطنية لنهر الليطاني ان توسّع نشاطها في مجالات جمع وتخزين وتحليل المعلومات وتحويلها لشكل يدعم سلامة اتخاذ القرارات. وتشمل هذه النشاطات تحديد ووضع الخرائط لاوضاع ونوعية المياه الحالية ومصادر التلوث ومراقبة توفر المياه الجوفية والسطحية والتصاريف والسحب وتسجيل الأحوال الجوية. ويمكن الجمع بين نماذج لاوضاع المياه في المستقبل ونتائج المراقبة الحالية لتقييم ومتابعة الوقت نفسه بوضع استراتيجية عمل للوصول الى خطة منتظمة ومحدثة لإدارة حوض النهر.

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