FINAL REPORT FOR ACTIVITY 1.2.6

GUIDELINES ON MEASURES FOR IMPROVING COMPLIANCE WITH WATER LEGISLATIONS AND ASSESSMENT OF ENFORCEMENT CAPACITY IN SWIM-SM REGION.

WITH FOCUS ON MOROCCO, JORDAN, ISRAEL, LEBANON AND EGYPT

IN SYNERGY WITH UMWELTBUNDESAMT - AUSTRIA

Version	Document Title	Author	Review and Clearance
2	**Final Report** GUIDELINES ON MEASURES FOR IMPROVING COMPLIANCE WITH WATER LEGISLATIONS AND ASSESSMENT OF ENFORCEMENT CAPACITY IN SWIM-SM REGION ACTIVITY 1.2.6	Prof. HosnyKhordagui	Stavros Damianidis and Vangelis Konstantianos

TABLE OF CONTENT

LIST OF ACRONYMS

AWM	Agricultural Water Management Projects
BMLWE	Beirut and Mount Lebanon Water Establishment
BOD	Bio-Chemical Oxygen demand
BWE	Bekaa Water Establishment
CC	Climate Change
CDR	Development and Reconstruction
CIHEAM	International Centre for Advanced Mediterranean Agronomic Studies
COD	Chemical Oxygen Demand
DPR	Delivery Performance ratio
DPDI	Directorate of Planning, Development & Information
EC	Electrical Conductivity
EIA	Environmental Impact Assessment
EMG	Experts Group Meeting
ENP	European Neighborhood Policy
EG	Egypt
EU	European Union
EU-Del	EU country delegations
EUWI Med	the European Union Water Initiative -the Mediterranean Component
FP	SWIM National Focal Point
FAO	Food and Agriculture Organization
IAEA	International Atomic Energy Organization
IL	Israel
ISSP	Institutional Support & Strengthening Program
IWRM	Integrated water Resources Management
JO	Jordan
JVA	Jordan Valley Authority
LO	Environment Liaison Officers
MO	Morocco
MoH	Ministry of Health
MoEnv	Ministry of Environment
MoEW	Ministry of Energy and Water

MOM	Management, Operation and Maintenance
MPL	Maximum Permissible Levels
MWI	Ministry of Water and Irrigation
MWRI	Ministry of Water Resources & Irrigation
NGO	Non Government Organization
NLWE	North Lebanon Water Establishment
NWC	National Water Council
NWRP	National Water Resources Plan
O&M	Operation and Maintenance
OECD	The Organization for Economic Co-operation and Development
PA	Palestine
PCBs	Poly-Chlorinated Bi-Phenyl
PCs	Partner Countries
PDO	Project Development Objective
PPPs	public-private partnerships
QA/QC	Quality Assurance/Quality Control
RSS	Royal Scientific Society
SD	Sustainable Development
SEA	Strategic Environmental Assessment
SLWE	South Lebanon Water Establishment ()
SWIM	Sustainable Water Integrated Management
SWIM-SM	Sustainable Water Integrated Management Support Mechanism
TOC	Total Organiccarbon
TU	Tunisia
UN	United Nations
UNDP	United Nations Development Program
UNESCO	United Nations Education and Science Organization
UNIDO	United Nations Industrial Development Organization
UNPFA	United Nations Population Fund Agency
USAID	United States Agency for International Development
US-EPA	United States - Environmental Protection Agency
WAJ	Water Authority of Jordan
WB	World Bank

WE	Water Establishments
WHO	World Health Organization
WUAs	Water Users Associations
WURC	Water Utility regulatory Commission
WWTP	Waste Water Treatment Plant
UNEP	United Nations Environment Program
ILO	International Labor Organization

EXECUTIVE SUMMARY

One of the main challenges towards implementing Integrated Water Resources management (IWRM) concepts identified in a regional review conducted by Sustainable Water Integrated Management - Support Mechanism (SWIM-SM) project during 2012 work plan was poor governance in the form of ineffective rule of law. This fact was re-emphasized by experts during the regional dialogue, conducted in the framework of this regional review, where (1) inadequate accredited monitoring systems, (2) meager inspection, (3) insufficient water rules and regulations, (4) poor compliance and (5) lack of enforcementcapacities including ill prepared judiciary systems were identified as main constraints towards good water governance and for the effective implementation of IWRM in the region.

Based on these facts, SWIM-SM devised the present work to reinforce IWRM principles in SWIM-SM Participating Countries (SWIM-SM PCs) through improvements in compliance and enhancement of enforcement capacities of water and environment legislations.

The specific objectives included (1) An assessment of current level of compliance with water and environment legislations and an evaluation of available enforcement capacity and mechanisms currently practiced in SWIM-SM region with special focus on 5 SWIM-SM PCs (Egypt, Israel, Jordan, Lebanon and Morocco) and (2) the production of guidelines on measures for improving compliance and enhancement of enforcement of water and environment legislations.

The present study is presenting an overview of the general state of compliance with water and environment requirements. It aims at identifying corroborated and feasible approaches for the enforcement of water and environmental legislation and to depict the capacity needed to ensure compliance in the SWIM Region.

In order to achieve the aforementioned objectives, SWIM-SM developed a check list (Annex 1) encompassing all information deemed necessary to (1) assess the degree of compliance with water and environment regulations and (2) evaluate the technical and institutional capacities available for the enforcement of these regulations. The information was collected and analyzed to portray thecurrent state of compliance with water and environment regulations and to assess the adequacy of these regulations and the available capacity to enforce them. Furthermore, valuable information was also capturedthrough discussions and deliberations during a three-day training workshop organized by SWIM-SM followed by a 12 days study tour in three European countries, namely the Netherlands, Spain and France. All SWIM-SM countries (except for Syria and Libya) participated in this training and study tour and were represented by 29 mid-career officials from the water and environment sectorsin addition to prosecutors.

The outcomes of this assessment and study tour discussions indicated that mostSWIM PCs are taking legal actionsto protect their scarce water resources and to restore the quality of their natural environment within an IWRM context.However, the majority of SWIM-PCswere found to base their water resources and environmental management strategies on legal requirements and legislation that are often inadequate, fragmented, technically inappropriate, or economically unaffordable, and ultimately unenforceable. Furthermore, the lack of comprehensive, cohesive, and effective systems for the enforcement of the enacted legislation in someSWIM-PCs has led, in many cases, to very

modest degrees of success in achieving compliance with water and environmental laws and regulations.

In some countries, managers of government-owned facilitieswere found to have little incentives to ensure compliance with the enacted water and environmental regulations. In many cases, monetary penalties for noncompliance, if imposed, are paid out of a central government budget, thus would have no impact on individual attitude. It was evident that it is very difficult to sue government entitiesor public sectors for noncompliance with water and environmental regulation in some SWIM-SM countries.

Deterrence as a main factor influencing compliance with water and environment regulations,is not genuinely practiced in someSWIM-SMcountries. The modality of eliminating economic gains resulting from non-compliance is hardly practiced in most SWIM-PCs. In addition, clear methodology for penalty calculation that would incorporate deterrence, or minimization of economic gain, is merely non-existing. Furthermore, lack of institutional credibility, political power, and adequate resources on the side of the regulating parties, and the inadequate knowledge and technology on the side of the regulated parties, are representing additional barriers to compliance in many countries of the region. In fewSWIM-PCs, psychological factors, like inertia, and fear of change, are major factors explaining non-compliance.

It was noticed that SWIM-PCs have adopted many approaches to manage water and environmental problems and to ensure compliance. However, the voluntary approach, that encourages or assists change without explicitly requiring it, is hardly applied in most SWIM-SMcountries. It was concluded that the **command and control approach is the most preferred and prevailing water and environment management formula in the SWIM-SM region. This approach, which consists of developing requirements, promoting, and enforcing compliance with the regulations was adopted but partially failed to produce the desired results in SWIM-PCs, especially because most of the effort was allocated to develop the command measures, neglecting the much more demanding control measures.** The market based/economic incentives approach that uses market forces to induce behavioral changesispractically applied by very few countries in the region. Furthermore, the risk-based approach, which establishes priorities for compliance and enforcement, based on the potential for reducing risks to water resources and environment, is used by very fewSWIM-PCs for purposes other than compliance and enforcement.

All SWIM-PCs have issued water and environment laws giving various degrees of authority to the regulating agencies, and establishing the institutional framework required for enforcement. However, some of these laws were found to be non-consistent, fragmented, overlapping, and sometimes conflicting with existing laws. In addition, most SWIM-SM countries are currently developing a number of integrated water and environment regulations, which establish in greater detail compared to laws, the general requirements that must be met by the regulated community. In nearly all cases, the developed regulations are fragmented and catered forsingle medium regulations that naturally require single medium monitoring, inspection, and enforcement systems.The implementation of technology standards, which require the regulated community to use a particular type of technology, is hardly considered by SWIM-PCs. However, practice standards that require or prohibit certain work activities that have significant impactsonwater resources and environment, are widely recognized and implemented. Requirements for reporting information through self-monitoring, self-inspection, and self-reporting programs were not familiar in most of SWIM-

SMregion. On the other hand, requirements for periodic permits and licenses, which control activities related to water and environment, are widely used as simple, affordable and effective enforcement tools both at the national and local levels in SWIM-PCs.

Water and Environment regulations are most effective if they are enforceable, in terms of being clear, understandable, accurate, precise in defining the requirements, and flexible. In order to ensure enforceability, SWIM-PCs would have to improve the social climate for compliance, identify the size of the regulated community, analyze the ability to comply without adding a burden on the regulated party, involve the regulated community and other stakeholders, and the enforcement officials in developing the requirements.

International experience has shown that promotion alone, or enforcement alone is not as effective as enforcement combined with promotion. This is particularly true, in the SWIM-SM region, where the size of the regulated community far exceeds the regulating party's resources, the prevalence of a social normof noncompliance, and the involvement of economic factor makes the regulated community reluctant to comply.

Among the measures of major importance that SWIM-PCs can use to promote compliance is education, information dissemination and technical assistance campaigns. Many SWIM-PCs failed to conduct such campaigns, mostly due to lack of perception and inadequate resources. Apart from few generic articles in the local newspapers, the media is hardly used to inform about water and environmental regulations and the corresponding enforcement activities. Furthermore, building public support and partnership, and developing an economic incentives system, incorporating fees, tax incentives, and subsidies, to ensure compliance with water and environment legislations are still limited in SWIM countries.

Monitoring compliance by collecting and analyzing information on the compliance status of the regulated community is fundamental for any enforcement program. In most SWIM-PCs, the main sources of information are inspections by program officers, self-monitoring and reporting, area monitoring, and citizen complaints. However, inspections was found to be the most predominating source of information in SWIM-PCs, providing the most relevant and reliable information and constituting the backbone of most water and environment enforcement programs. Yet, the field inspection capacity in many SWIM-PCsis stillinneedfor further development. **Additional resources have to be allocated towards establishing and strengthening the capacity needed for the enforcement of water and environment regulations.** Towards this end the report is providing a programmatic step-by-step methodology for building inspection capacity in SWIM-PCs in need.

In most SWIM-PCs self-monitoring is not a very common practice. Except in very few cases, remote sensing and over-flight techniques are used for area monitoring. In the SWIM-SM region, citizen complaints are one of the most prevailing source of information after inspections, However, this source of information is often sporadic, non-consistent, and in many cases unreliable.

The second element in compliance with water and environment regulations, in addition to monitoring programs, is the establishment of enforcement response.Various types of actions can be taken in order to respond to violations, from informal and formal administrative actions, civil judicial actions, to criminal judicial actions. Informal administrative actions arewidely used in most SWIM PCs. on the other hand, the efficiency of court systems, required for judicial actions, varies widely among SWIM-PCs, while the number of judges, familiar with water and environmental laws in the region, was found to beextremely insufficient.

Enforcement necessitates the submission of unchallenged indictment evidences of violations and non-compliance to the court of law if necessary. Credible evidence is the only means by which any alleged fact under investigation may be established or dismissed. The means and criteria that are commonly used to insure the credibility of evidence for noncompliance in SWIM-PCswas found to suffer from inadequate quality assurance/quality control in sampling and analysis. Furthermore, many SWIM-PCs are unfamiliar with chain-of-custody that allows the handling of water and environment samples to be traced at any moment in time and from insufficient documentation of all information about samples from collection to test results. It has also been noticed that most SWIM-PCs suffer from the near absence of expert and witness for testimony that is based on professional and personal experience.

Penalties either in the forms of incarceration or monetary fines are customarily used to realize deterrence. It also ensures that violators do not obtain economic advantage. In case of application in SWIM-SM-PCs, the monetary penalty wasn't based on a clear calculation methodology that reflects the seriousness and gravity of the violation. Furthermore, the water and environment regulations in the region didn't include the maximum statutory penalty to set the basis for estimating the potential maximum penalty liability. A brief methodology to calculate monetary penalties for pollutant discharges to fresh water bodies is suggested and discussed in the fourth chapter of the report. The methodology incorporates the economic benefit obtained as a result of delayed or completely avoided control expenditures, a gravity component to ensure that the violator is economically worse off than if he had complied, and a gravity adjustment factor that would increase gravity if the violator has a known history of recalcitrance, or reduce gravity if the violator is expected to cooperate.

Based on the outcomes of the survey and deliberations during the training workshop and study tour, two guidelines were developed and geared towards needs of SWIM-SM countries with adequate considerations to the socio-economic specificities of the region.

Guidelines for improving compliance with water and environment legislations are elaborated in chapter 3 and consist of six fundamental elements according to the following action oriented sequence:

STEP-I -Identify the management approaches that ensure compliance with water and environment legislations.

STEP II- Create regulations that commensurate with the command & control approach

STEP III- Communicate requirements and their means of compliance

STEP IV- Create an enabling environment for compliance

STEPV- Motivate the regulated community to comply

STEP VI- Monitor compliance

In order to develop water and environment enforcement capacities to ensure compliance in the SWIM-SM region, a guideline was developedin chapter 4 and consists of the following action oriented five steps:

STEP I- Establish and develop the capacity of an inspection system

STEP II- Establish a monitoring and measuring system to verify compliance

STEP III- Ensure credibility of the indicting evidences

STEP IV- Establish enforcement response system to violations

STEP V- Develop a system to assess and incorporate proportionate penalties

INTRODUCTION

One of the main challenges towards implementing Integrated Water Resources management (IWRM) concepts identified in a regional review conducted by the SWIM-SM project during 2012 work plan, was the ineffective rule of law. This fact was re-emphasized during the regional dialogue, conducted in the framework of this regional review, where inadequate accredited monitoring systems, meager inspection, insufficient water rules and regulations, poor compliance and lack of enforcement technical and institutional capacities including ill prepared judiciary systems were identified as main constraints towards good water governance and the effective implementation of IWRM.

Many countries in the SWIM-SM Region are taking action to protect their scarce water resources and the quality of their natural environment. Most of the SWIM-SM PCs have either developed or are currently developing National water resources strategies or plan of actions that are based on IWRM principles integrating environmental flow within water resources management. The majority SWIM-SM countries has practically based their water resources management strategies on legal requirements (water and environment legislations) that must be met by various sectors that use water and may cause degradation in water quality that hinders its proper use. These requirements in the form of water and environment laws and associated by-laws are the most important foundation for an effective water resources and environmental management system; nevertheless they are only the first step. The more important subsequent step is compliance, i.e. getting the regulated sectors to comply by fully implementing these regulations[1]. Unfortunately, compliance does not occur automatically once regulations are issued. Achieving compliance usually involves efforts to promote, encourage, and ultimately compel the behavioral changes needed to achieve compliance. There is no magic formula for achieving compliance. There is merely trial, evaluation, and response to what works and does not work in the particular socio-economic and bio-geo-physical settings of each SWIM-SM country.According to The World Congress on Justice, Governance and Law for Environmental Sustainability in The World Summit on Sustainable Development (Rio+20)[2], an independent judiciary and judicial process are vital for the implementation, development and enforcement of environmental law, and members of the judiciary, as well as those contributing to the judicial process at the national, regional and global levels, are crucial partners for promoting compliance with, and the implementation and enforcement of, international and national environmental law.

[1] European Commission (March 2012) "Improving Delivery of Benefits from EU Environment Measures: Building Confidence Through Better Knowledge and Responsiveness" A communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions.
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do%3Furi%3DCOM:2012:0095:FIN:EN:PDF

[2]UNEP Division of Environmental Law and Conventions, (Nov. 2012), "Advancing Justice, Governance and Law for Environmental Sustainability" by "The World Congress on Justice, Governance and Law for Environmental Sustainability".UNON Publishing ServicesSection, Nairobi.
http://www.unep.org/environmentalgovernance/Portals/8/documents/Advancing%2520Justice,%2520Governance%2520and%2520Law%2520(WV).pdf

Experience from around the world has shown that promotion of compliance alone (carrot alone) is often not effective. Enforcement (stick) is important to create a climate in which members of the regulated community will have clear incentives to make use of the opportunities and resources provided by promotion (carrot). Experience has also shown that enforcement alone (stick alone) is not as effective as enforcement combined with promotion (carrot + stick).

Without a single exception, all SWIM-SM PCs have passed legislation for the management and protection of their water resources and environment with various but chiefly modest degrees of success in compliance. The main challenging problem contributing to such limited accomplishment is the lack of a comprehensive, cohesive and effective system for the enforcement of enacted legislation. In most of the cases, deficiencies of water and environment protection are not necessarily the results of poorly designed laws but to a larger extent, the lack of their enforcing capacities and inadequacy of key compelling systems.This is highly pronounced in some SWIM countries in which water resources and its associated environmental protection is not a political priority. Furthermore, most SWIM-SM PCs suffers from ineffective enforcement regulations and measures, such as ill-defined fines and penalties particularly in the publicly owned economic sectors.

If countries of the SWIM region fail to ensure that the policies and laws they enact are equally complied with, they will surely jeopardize their own credibility as well as the validity of the law. Their sincere efforts in developing water resources and environmental policy will be wasted and IWRM strategies and environmental regulations will become “paper-tiger” or “straw-man” i.e. just words on paper with no actual improvement in water resources management and/or environmental protection. Overlooking the enforcement of water and environment laws in SWIM-SM PCs will undoubtedly lead to the spreading of a social norm or a culture that implies “non-compliance is tolerated and compliance is not important”.

In general, the current water and environment laws and their associated regulations in many of SWIM-SM PCs are either inadequate or fragmented to address the scale of deterioration of their national water resources and natural environment.

The majority of compartmentalized legislation, which have been historically dealt with by separate national and sometimes local institutions are outdated, overlapping, ineffective, non-cohesive, and imprecise. In some instances, the government owned facilities were found to be the most significant violators of water and environment laws and regulations set by the same government. It has also been noticed that water and environmental legislations are often unenforceable because they are either technically inappropriate or economically unaffordable.

It is important to emphasize that the consequences of ignoring monitoring and enforcement issues in SWIM-SM PCs can be disastrous for water resources, environmental quality and social welfare of communities in the region. If a regulatory agency imposes a new stricter regulation but non-compliance is uncontrolled, it is possible that the ultimate result will be more degradation in water resources and deterioration in water quality. Alternatively, ignoring monitoring and enforcement might lead the government to implement a policy that is ultimately more costly than one currently in existence. High enforcement costs and imperfect compliance makes regulations less effective than desired. Thus monitoring and enforcement concerns should influence choices about how to regulate, and in some cases, about whether to regulate at all.

It is important to note that an implementable legislative regime is indispensable for effective water resources management within an IWRM context and also to ensure sustainable development. It is particularly important not only to ensure that the network of water and environmental legislation and related institutions are substantively adequate and implementable, but also that the implementing agency/agencies have the capacity in terms of human and material resources to carry out their functions effectively.

Thus, a dependable and feasible legislative and institutional system at the national level, which is country specific, is imperative for the proper water and environmental management in SWIM Region.Compliance means the state of conformity with laws[3]. Compliance occurs when water andenvironment legislations are met and desired changes are achieved. If the water and/or environment legislations are poorly designed, then achieving compliance and/or desired results will be hard if not impossible. It is traditionally known that in order to secure compliance, governments of the region should ideally take the following three consecutive activities:

a) Issue the proper water and environment requirements (laws, by-laws, legislations, acts, and codes of conduct, etc.).

b) Promote compliance through communication of legislation, publication of relevant information, consultation with affected parties, provision of technical assistance to affected parties, etc.

c) Enforce the legislation through the following:

- Development of the inspection capacities, credible monitoring, and accredited measuring systems to verify compliance,
- Preparation of procedures for investigations of violations and rules for assessment of penalties,
- Identification of the measures taken to compel compliance without resorting to formal court action, such as directions by inspectors, ticketing, and Ministerial orders, and
- Development of measures to compel compliance through court action, such as injunctions, prosecution, court orders upon conviction, and civil suit for recovery of costs.

Based on these facts, SWIM-SM devised the present work to reinforce IWRM principles in SWIM-SM PCs through improvements in compliance and enhancement of enforcement capacities of water and environment legislations. The specific objectives included (1) An assessment of current level of compliance with water and environment legislations and an evaluation of available enforcement capacity and mechanisms currently practiced in SWIM-SM region with special focus on five SWIM-SM PCs (namely Egypt, Israel, Jordan, LebanonandMorocco) and (2) the production of guidelines on measures for improving compliance and enhancement of enforcement of water and environment legislations. This entailed:

1. An evaluation of the general state of compliance with water legislations; identify constraints, gaps & challenges in achieving compliance; identify opportunities and capacity needed to

[3]Environmental Protection Agency, United States of America, (June, 1992),"Principles of Environmental Enforcement".EPA Number 300f93001.
http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=500003C8.txt

bridge the gaps (Chapter 1).

2. An assessment of the available enforcement capacity & mechanisms currently practiced in SWIM-SM PCs to enforce water legislations and identify achievements, constraints, gaps and challenges (Chapter 2).
3. The development of regional guidelines for SWIM countries on measures for improving compliance (Chapter 3) and to enhance national enforcement capacities with water and environment regulations (Chapter 4).

The present study is presenting an overview of the general state of compliance with environmental requirements; to identify corroborated and feasible approaches for the enforcement of environmental legislation; and to depict the capacity needed to ensure environmental compliance in the SWIM Region.

In order to achieve the aforementioned objectives, SWIM-SM developed a check list (annex 1) encompassing all information deemed necessary to (1) assess the degree of compliance with water and environment regulations and (2) to evaluate the technical and institutional capacities available for the enforcement of these regulations. Towards this aim, SWIM-SM engaged one national Non Key Expert (NKE) from each of the five focus countries to interview relevant government officials and solicit the information requested in the developed check list. Furthermore, valuable information was also captured through discussions and deliberations during a three-day training workshop organized by SWIM-SM followed by a 12 days study tour in three European countries, namely Netherland, Spain and France. All SWIM-SM countries (except for Syria and Libya) participated in this training and study tour and were represented by 29 mid-career officials from the water and environment sectorsin addition to prosecutors.The information was collected, compiled and analyzed to portray to current state of compliance with water and environment regulations and to assess the adequacy of these regulations and the available capacity to enforce them.

1 Assessment of Compliance with Water Legislations in Selected SWIM-SM Countries

1.1 Background and introduction

Sustainable management of scarce water resources in the SWIM-SM region within an IWRM context including environmental flow has received increased attention over the last few years with the expansion of the concept of Sustainable Development (SD). Traditional ways of water resources management in the region became subject to extensive revisions and analysis in view of their questionable effectiveness and validity.

Currently there are many adopted approaches to manage the water resources and their associated environmental problems and ensure compliance with their relevant regulations in the SWIM-SM Region. The need for and scope of enforcement policies partially count upon which management approach or combination of approaches is currently being used in the region. The following is a discussion of the various approaches used or tested in selected SWIM-SM PCs accompanied by an analysis of their effectiveness in reaching compliance with the promulgated water and environment legislations.

One of the primary goals of enforcement to comply with water and environment regulations in SWIM-PCs is to change the present human behavior so those regulations are adhered to. Achieving this goal involves motivating the regulated community to comply, removing obstacles that prevent compliance, and overcoming existing factors that encourage non-compliance.

The assessment of compliance with water legislation includes key findings from the analyses of the "Check-lists to assess the available enforcement capacity and mechanisms currently practiced in SWIM-SM region to enforce water legislations" for the five countries concerned (Egypt, Israel, Jordan, Lebanon and Morocco). The check-lists (Annex I) aimed at guiding national Non-Key-Experts (NKEs) through interviews and included information to be collected from national regulating authorities to describe the current level of compliance and adequacy of technical, institutional and legislative capabilities to enforce water and environment legislations in the selected SWIM-SM PCs. Check-lists were sent out in March 2013 with a deadline to provide replies until 18 April 2013. Information was provided for Egypt on 18 April 2013, for Israel on 30 April 2013, for Jordan on 5 May 2013, for Lebanon on 23 April 2013 and for Morocco on 23 April 2013. Additional information on the subject was collected during the discussions and deliberations of an extensive training workshop that was followed by a long study tour in three European countries, namely Netherland, Spain and France. The training and study tour was attended by 28 participants representing the water, environment sectors in addition to relevant prosecutors from 8 SWIM-SM countries including the five surveyed countries.

This chapter provides an overview of the general state of compliance with water legislation including different approaches chosen in the countries to reach compliance. Itidentifies constraints, gaps and challenges in achieving compliance as well as opportunities and capacity needed to bridge the gaps. Factors affecting compliance with water legislationare deterrence concerns, economics aspects, institutional credibility and predictability, social considerations, psychological concerns andknowledge and technology.

In general all five countries are currently facing very challenging water and environment management issues, in particular due to growing population, urbanization and expanding industrial, residential and agricultural water demand and deteriorating water quality on the one side, and increasing water scarcity (in particular in Egypt, Israel, Jordan and parts of Morocco) on the other side. The challenges facing the water sector are enormous and require the mobilisation of all human and financial resources and the management of the water resources in an integrated manner.

It can be revealed from the analysis that in terms of institutional capacity building and elaboration of national strategies as well as relevant (new) water legislation, many efforts have been made in the countries concerned in recent years. Details can be derived from the five case studies for the five concerned countries. However, compliance with water and environment legislation and the capacities to enforce these legislations are still not sufficient in the five focus countries and often considered as weak.

1.2 Approaches for Compliance

There are many approaches to ensure compliance with water and environment legislation. The need for and scope of enforcement policies partially dependson which management approach or combination of approaches are currently in use.

1.2.1 The Voluntary Approach

This approach encourages or assists change, but does not require it[4]. It heavily relies upon public education, technical assistance, and the promotion of water and/or environment leadership by the regulated community and NGOs. Voluntary approachencompasses management of water resources including environmental flow to maintain acceptable environmental quality[5]. Successful voluntary compliance programs allow governments' always limited resources to be focused on poorer performing organizations, build support for enforcement efforts, and help embed IWRM concepts and principles in the management of water resources, making it less likely that the regulated community will violate water and/or environment laws[6].

Due to the relatively weak enforcement and inspection infrastructure needed to monitor and follow-up on the voluntary compliance in most of SWIM-SM PCs, the voluntary approach is hardly used. Due to the lack of appropriate education and the insufficient level of awareness among the regulated communityand the public at large this approach is not applied in all five surveyed countries. The available monitoring and inspection infrastructure is currently not sufficient for this approach.

[4]Commission for Environmental Cooperation, (1998), "Voluntary measures to ensure environmental compliance" A Review and Analysis of North American Initiatives, Commission for Environmental Cooperation, Montreal (Quebec), Canada.<*http://www3.cec.org/islandora/en/item/1715-voluntary-measures-ensure-environmental-compliance-en.pdf*>

[5] Schaffer, E.S., (1996), "Encouraging voluntary compliance without compromising enforcement: EPA's 1995 auditing policy" In "Fourth International Conference on Environmental Compliance and Enforcement" April 22-26 in Chiang Mai, Thailand.
http://yosemite.epa.gov/ee/epalib/eelib.nsf/4b06bcc40bc939f285256a290076a56e/b01f0587eee2eef985256aa000488bc7!Open Document.

[6] Leroy, Paddock, (1996), "Stimulating voluntary compliance: New policy directions in the United States: The Minnesota experience" In "Fourth International Conference on Environmental Compliance and Enforcement" April 22-26 in Chiang Mai, Thailand. *http://www.inece.org/4thvol1/paddock.pdf.*

The general culture of complying with laws on a voluntary basis is not prevailing. However, for Israel it was indicated that some facilities, which are mostly global enterprises, operate beyond minimum compliance requirements. In Jordan, few people and facilities are abiding by legislations on voluntary basis, which is dependent onlevel of public awareness, advocacy from NGOs and community based associations, and the availability of funds to invest in compliance. The application of the voluntary approach would require a long transformation process of society and its attitudes as well as the adoption of new tools by the regulatory authority. For Morocco, it canbe seen that there are many civil society associations, but their work is hampered by the lack of resources and negative public attitude. In all five focus countries, the technical capacity, enacted regulations and infrastructures were found inadequate to properly implement self monitoring and reporting through the voluntary mechanism.

1.2.2 The Command & Control Approach

In the command and control approach, the water and environment regulating authorities prescribe the desired changes through detailed regulations, promote compliance with these regulations and finally enforce compliance with these requirements.

Based on the outcomes of the survey and discussions during the study tour, command and control approach appeared to be the currentlyprevailingmethod used in the field of water and environment management in the focus five countries. However, the sanctions and enforcement component is often very weak and needs major strengthening; reasons are in particular the lack of financial and human resources for proper implementation. The approach is, unfortunately, not supplemented with other approaches such as market-based economic incentive or participatory approaches in Egypt, Lebanon and Morocco. In Jordan, these approaches are not yet applied. However, the Jordan Environmental Fund is seen as a possible tool, but not yet activated for this purpose. In Israel, there is increasing reliance on the market-based economic incentive approach, while the participatory approach is not at all implemented in Israel.

A well-designed series of legislation created by the government is in place in Egypt, Israel, Lebanon and Morocco. Jordan lacks one single water act and a consolidated legal and governance framework in the water sector. Participation and involvement from different sectors and stakeholders in the elaboration of legislation was ensured to a high level in Egypt, Israel and Morocco, to a certain extent in Jordan and to a very limited degree in Lebanon.

Fragmentation of water and environment laws was assessed as a problem in Egypt (e.g. current code for wastewater reuse is not accommodating future needs). Following the establishment of the Water Authority in Israel in 2007, fragmentation was substantially reduced. Presently, there is still some fragmentation in the sewage and wastewater segments and in the regulation over agricultural water quality in Israel. In certain cases, public health, water and environmental regulations are overlapping in Israel. For Morocco, the law is currently being revised and expected for the year 2015 with marine and coastal waters included in the scope of the law.

The roles, responsibilities and specific tasks inthe implementation, enforcement, inspection and control of compliance are in general sufficiently and clearly addressed in water legislation and provide the necessary authorities and mandates for enforcement in Egypt, Israel, Lebanon and Morocco. However, in most countries problems with the sanctions and enforcement capabilities were identified. A considerable gap in a cascaded and streamlined understanding of the different

roles and responsibilities of each institution can be seen in Jordan; mandates are partly overlapping and there is only a very weak coordination betweendifferentinstitutions. These structural and functional weaknesses result in accountability and transparency gaps (e.g. including inspections for drinking water and wastewater which are done by various institutions at the same time) and hinder the efficient enforceability of the legislation.

In most of the countries, there is a strong need for the government to allocate adequate resources to promote compliance with water and environment requirements.

Inadequate promotion of compliance in Egypt this is due to high costs of media promotion, especially TV (e.g. advertisement of promoting compliance in TV spots).

With the exception of Jordan, the requirements in water legislation are mostly based on affordable, reliable and available technologies in all countries. However, due to the related costs of the required technology, there might be certain gaps in the implementation of the required technology.

All water "sources" (including surface waters, groundwater, transitional, coastal and marine waters) are addressed in the water legislation in Israel, Lebanon (but updates are needed as regards drinking and bathing water) and Morocco (with the exception of marine and coastal waters). Not all water sources are covered in both Egypt and Jordan.

In many SWIM-PCs, the public sector represents a significant fraction of the production & service sectors in the national economies. In these cases, enforcement of water and environment regulations by one government organization against another government organization is usually difficult for many reasons.

For instance, monetary penalties imposed on a government-owned non-complying entity in any SWIM-PCs are usually paid for out of the central budget of the same government. Furthermore, the loss of such money generally has little or no impact on the non-complying regulated community.

In some SWIM Region's government systems, it is difficult to hold managers and/or operators of publicly owned facilities accountable for failing to comply with water and environment regulations. Generally, the managers of the publicly owned entities are receiving conflicting signals. In numerous cases a signal would come from one government authority (usually water and environment regulating agency) requesting compliance with regulations, meanwhile, a signal from another higher political authority would come demanding higher levels of production and job creation regardless of the associated implications on water resources or environment. In some cases, citizens, NGOs and government regulating agencies in some SWIM-PCs cannot sue government authorities for failure to comply with water and environment regulations. For all aforementioned reasons, it appears that managers in the public sector may have little incentive to ensure that their facilities are in compliance with the enacted regulations.

Clear deadlines to comply with the water and environment provisions are included in the legislation of Israel; only partly deadlines can be found in the water legislation for Egypt with a specified grace period for compliance. In Jordan neither environmental objectives, nor grace periods are incorporated in the law; only health-related water aspects are included in legislation concerning drinking water. For Lebanon, water related environmental objectives are included in the law; however clear deadlines to achieve those objectives are not indicated in the legislation. Environmental objectives were identified and set in the concerned legislation in Morocco; the law

also provides deadlines to comply with, however, these deadlines were extended twice and there are still difficulties in achieving compliance. All relevant sectors (e.g. agriculture, industries, tourism, and households) are addressed by water legislation in Egypt, Israel and Morocco; not all sectors are included in the law in Jordan and Lebanon. Measures to be implemented in order to meet the required environmental objectives are sufficiently and clearly addressed in Israel, Lebanon, Morocco and to a high extent in Jordan. In Egypt measures are neither sufficiently nor clearly addressed in water legislations. The definition of the conditions for any exception or deviation from water and environment regulations is included in legislation in Morocco and to a high extent in Jordan and Israel. It is not addressed in Egypt and not precisely defined in Lebanon.

Fines and penalties for non-compliance are sufficiently and clearly addressed (administrative actions, civil and/or criminal judicial actions) in Morocco; reasons are identified and amounts fixed. Fines are assessed based on the nature and severity of the offence. Fines and penalties are not clearly addressed in Egypt, Jordan and Lebanon water and/or environment legislations. Fines and penalties for non-compliance with the provisions included in water legislation in Israel are lacking intermediate and administrative actions and proportionate enforcement measures. Draconian tools are foreseen, such as license revoking and criminal offences, but no intermediate sanctions (such as administrative fines). The currently available sanctions are very severe, such as criminal proceedings, which involve complex and long litigation processes and are therefore rarely used. Legislation defining how monitoring of compliance is proofed by specifying measuring techniques, testing methods and procedures is in place in Egypt. However, clear provisions for technical specifications and standardized methods for the respective analysis are not always included. In Israel, water monitoring methods are subject to additional standardisation processes.

To variousdegrees, water and environment legislations in the focus countries were found to be flexible enough to be adapted through individual permits and/or licences without jeopardizing their credibility. While it is almost totally inflexible in Egypt, it is to a highly flexible in Morocco and to a smaller extent in Lebanon. No integrated and clear permitting/licensing system is in place in Jordan. In Israel, the standard method of action is granting individual licences, which are mostly very detailed.

More efforts are needed to avoid the problem of translocation of water pollutants from one media to another in Egypt, Israel, Jordan, Lebanon and Morocco. There is legislation in Israel requiring the reporting of discharges transmitted to different environmental components. A new environmental licensing law implementing a comprehensive approach to emissions to the environment from all media is in legal process to be adopted in Israel.

Moreover, experience gained from around the world indicates that command and control were not the ultimate solution for the proper management of the environment. Effective command and control approaches were always supplemented by a combination of other approaches such as risk-based approaches, market-based economic incentive approaches, participatory approaches, etc. These approaches will be assessed and elaborated further in the following section of the report.

1.2.3 Market Based/Economic Incentive Approach

Market based/economic incentive approaches use market forces to achieve desired behavioral changes[7]. In the developed world, economic instruments as opposed to regulatory (command and control) measures have been met with increased interest as a means of implementing the principles of IWRM including environmental flow. However, these approaches can be independent of, or build upon and reenforce command and control approaches. For example, introducing market forces into a command and control approach can encourage greater compliance with water and environment regulations and provide economic solutions to sustainable development problems.

The efficiency of market dis-incentives lies in achieving full costing at the micro-economic level, thus permitting individual polluters to choose among a range of alternatives in matching costs with benefits. There are however, limits to the useful application of economic instruments. Command and control measures would have to be applied where acute, high-risk effects require immediate action rather than time lagged prompting through incentives.

In the SWIM-SM region, it appears that the main obstacle towards the implementation of market-based/economic incentives approaches in water resources and environmental management in most of the PCs is the relative low priority given to these issues as compared to economic development.

The government imposes a fee system on discharges and other environmental releases to water bodies in Egypt and Morocco. However, in Egypt this system is regarded by some as weak “a paper tiger that nobody fears”. For Israel such a system exists to a certain extent; no tools are available in Jordan and Lebanon. Promoting water tariffs for water services including progressivetariffs on water consumption to promote prudent use of water is an issue in Israel and as regards drinking water in Morocco. That is the case in Egypt, Jordan but not in Lebanon. As for Egypt, the government is not promoting any enhancement ofthe current water tariff system whichis currently not equally enforced on all sectors, most users pay a monthly lump sum rather than a meter based tariff. The industrial sector is more precisely charged for water. Water used for irrigation is totally free with some cost recovery schemes proposed. In general water pricing, particularly for irrigation, is an “alien issue” to Egyptian culture. Water tariffs are highly subsidized in Jordan. InLebanon, water tariffs are based on a flat rate and are not related to the quantity used.The government of Israeloffers economic incentives on water savings and conservation as well as for water quality protection efforts. The regulators in Israel provide economic incentives for water quality protection efforts including efficient consumption levels, such as reduced extraction levies for water producers that improve the water quality. Furthermore, there are incentives for the re-use of water, efficient irrigation and reduction of water losses.There are no incentives in Egypt(the Ministry of Environment just offers tax deductions on imported equipment related to an environment/water saving project), Jordan, Lebanon and Morocco. For Morocco, it was indicated that there is no available budget available for to provide incentives for compliance.

7OECD (2008),"The Polluter Pays Principle", OECD Publishing. OECD-Environmental Directorate, Paris, France <http://www.keepeek.com/Digital-Asset-Management/oecd/environment/the-polluter-pays-principle_9789264044845-en>

1.2.4 Risk Based Approach

This approach establishes priorities for compliance and enforcement based on the potential for reducing the risks posed to water resources and/or the environment[8].

The capacity available for the quantitative assessment of risk to both water resources and ecological endowments is extremely limited in the SWIM-SM Region. This limitation is attributed to one or more of the following reasons:

1. Inadequacy of regular water and environment monitoring programs.
2. Lack of investigations that can correlate between social wellbeing and availability of water resources and environmental health.
3. Inadequacy of reliable database and information systems capable of storing, retrieving and disseminating water and environment data for conducting risk assessment studies.
4. Insufficient national expertise in the area of bio-statistics, environmental economics, environmental health and ecological risk assessment.
5. Some of the governments in the SWIM-SM region consider risk assessment investigations and their potential communication to the public as a sensitive issue of potentially political and undesirable ramifications.
6. Some of the water and environment data available for risk assessment studies suffers from uncertainty due to inadequate Quality Assurance/Quality Control (QA/QC) programs in monitoring.

The risk-based approach establishes priorities for compliance and enforcement based on the potential for reducing the risks posed to public health, water resources and/or the environment. Adequate water and environment monitoring programs systematically measure water consumption and waste water discharges to the freshwater bodies in Egypt, Israel and Morocco; no monitoring systems are in place in Jordan and Lebanon. A reliable database and information system capable of storing, retrieving and disseminating water and environment data to assess risks and follow-up on non-compliance is implemented to a certain extent in Egypt (only moderately effective) and Lebanon (still a significant effort to be made to have a well maintained and usable database). For Israel, different databases are used by each of the Ministries and the Water Authority. In Jordan and Morocco no national database and information system is available.

1.3 Factors Affecting Compliance of Water & Environment Legislations[9]

1.3.1 Deterrence

The phenomenon of public changing their normal behavior to avoid a penalty is called deterrence. Enforcement deters detected violators from violating again, and it does deter other potential

[8]Kolluru, R., S. Bartell, R. Pitblado and S. Stricoff, (1996), "Risk assessment and management handbook for environmental health and safety professionals" McGraw-Hill, Inc.
http://www.amazon.com/Risk-Assessment-Management-Handbook-Environmental/dp/0070359873
[9] Ibid 3

violators by sending a message that they too may experience adverse consequences for their noncompliance.

Conceptually, deterrence will be very effective pending the fulfillment of the following preconditions:

- **If violations are very likely to be detected**
- **If the official response to violations is swift and predictable**
- **If the response includes a proportionate sanction**
- **If the regulated parties perceive that the first three conditions are serious facts.**

According to the most optimistic assessment, deterrence is considered at its infancy stage in SWIM-SM countries. Currently, the competent regulating authorities do not practice genuine deterrence. The penalty either in the form of jail sentences and/or monetary values is determined arbitrarily and is not based on a clear methodology for penalty calculation that incorporates the deterrence proportions. Many of SWIM-SM PCs would charge a flat rate penalty for noncompliance with water and/or environment regulations without regard to the seriousness or extent of the inflicted damage.

Based on discussions with government officials in the five focus countries, water and environment violations are likely to be detected in Israel, not likely to be detected in Egypt and Morocco; rather moderately likely in Jordan (higher in water than in environment) and to a small level likely to be detected in Lebanon. The official response of the government to violations is swift and predictable in Egypt (if detected). Due to the lack of proportionate and intermediate sanctions, the response will in many cases be slow and ineffective in Israel, Jordan, Lebanon and Morocco. The response usually includes a proportionate sanction in Egypt (if detected), not in Israel, Lebanon and Morocco and very rarely in Jordan.

1.3.2 Economic Factors

The regulated community will be more likely to comply in case (1) when enforcement officials can demonstrate that compliance will save money, or (2) when the government provides some form of subsidy for compliance.

To eliminate any economic gain reaped by violating water and environment regulations, the monetary penalty for violation would, ideally, at least equal the amount the violator would save by not complying[10]. This deters deliberate economic decisions not to comply, and help treat compliers and non-compliers equally.

Enforcement officials are capable of demonstrating that compliance with water and environment regulations will save money to a certain extent in Israel, but not in Egypt, Jordan, Lebanon and Morocco. Provisions of subsidy for compliance are available to a certain extent in Israel, but not in Egypt, Jordan, Lebanon and Morocco. An approved methodology for penalty calculation of non-

[10] Jonathan, L. (1996), "Making the polluter pay: EPA's experience in recapturing a violator's economic benefit from noncompliance" In "Fourth International Conference on Environmental Compliance and Enforcement" April 22-26 in Chiang Mai, Thailand.
http://yosemite.epa.gov/ee/epalib/eelib.nsf/4b06bcc40bc939f285256a290076a56e/b01f0587eee2eef985256aa000488bc7!Open Document.

compliance is not existent in the five surveyed SWIM-SM countries. There are formal procedures calculating fines and fee scales in Morocco, but these fines remain symbolic.

1.3.3 Institutional Capacity and Credibility

Each country in the SWIM-SM Region has its own social norms concerning compliance with water and environment regulations. These norms derive largely from the credibility of the laws and the seriousness of the institutions responsible for their implementation. In most of the SWIM-SM surveyed countries, legislations, and some kind of institutions and regulating bodies were established to ensure compliance with water and environment regulations. The enacted legislation is seen as adequate to ensure compliance in Egypt, Israel and Morocco (to a high extent); while it is not seen adequate in Jordan and Lebanon. The institutions responsible for enforcement lack the political power in Egypt, Israel, Jordan, and Lebanon as well as to a lower level in Morocco. Implementing institutions have adequate human and financial resources for the implementation of water and environment legislation in Egypt; a considerable shortage was reported in Israel, depending on the sector (more in water, less in environment) shortages was also noticed in Jordan In Lebanon and Morocco adequate resources were found nearly missing. All projects are subject to an EIA in Egypt, Jordan, mainly in Israel and in Lebanon. No information was available from Morocco. The problem that some sectors are unofficially exempt from complying with provisions to presumably promote economic development and reduce unemployment is of no relevance in Egypt, to a small extent in Israel, Lebanon and Morocco as well as to a minor extent in Jordan. Political forces and/or favours are not influencing compliance in Egypt and Israel, to a certain extent in Jordan and Lebanon and to a minor extent in Morocco. Corruption as one of the elements contributing to non-compliance plays a role in Jordan and Lebanon, a small and minor role in Egypt (untraceable corruption) and Morocco. In Israel only small irregularities, but not corruption, can be seen in the agricultural sector.

Within this context, SWIM-SM PCs should recognize that their government's attention to enforce water and environment regulations (that is to unequivocally promote voluntary compliance and identify and impose legal consequences on those who do not comply voluntarily) shape and influence the prevailing social values. A goal on the part of the governments to bring the majority of regulated community into compliance sends a message that compliance is essential and helps build a social norm of conformity.

In most of SWIM-SM PCs, the unimpressive history and social norms of noncompliance with water and environment regulations can be attributed to one or more of the following reasons:

1. **The enacted environmental laws are unenforceable due to defects in their design.**
2. **The institutions responsible for enforcement are lacking the political power.**
3. **The implementing institutions do not possess adequate resources for the enforcement of water and environment regulations.**
4. **In few cases some large-scale national development projects with significant socio-political ramifications are politically exempt from complying with some of the ratified water and environment regulations.**

1.3.4 Social Factors

The role of governments is to bring a majority of the regulated community into a social norm of compliance and to establish a culture of conformity with water and environment regulations. However, personal and social relationships play a pronounced role in the implementation of environmental legislation.Compliance with legislation out of agenuine desire to conserve water and improve environmental quality is not usually the casein Egypt, Jordan, Lebanon and Morocco; only moderately in Israel. The fear of loss of prestige that can result if information about non-compliance with provisions is made public is to some extent prevailing in Egypt and Lebanon (social media is playing an important role), moderately relevant in Israel and not the case in Jordan (golden or black lists of businesses are not published) or Morocco (only concern is not to run the risk of causing health incidents or disturbing public order).Friendly relationships between enforcement program supervisors and managers of regulated facilities affecting the level of compliance may have a slight influence in Egypt, Israel, Jordan and Morocco. It is not assessed as relevant in Lebanon.

1.3.5 Psychological Factors

Compliance with water and environment legislations necessitates some changes in operation and management. A major common factor in human nature is the fear of changes. Many people particularly in the public sectors and/or public utilities tend to naturally resist changes because of the perceived effort it will require to comply with regulations. The fear of changes affecting the level of complianceis not very relevant in Egypt, Lebanon and Morocco; some concern can be seen in Israel. As for Jordan, this aspect is very relevant (for example currently as regards improving permitting procedures and inspection methods). Financial incentives are not being considered to compensate for the extra efforts needed to comply with legislationin all five countries with the exception of Israel, where this issue is to some extent relevant. On the other side, serious punishment can be seen as a major factor for promoting compliance with legislationin Egypt and Jordan, to some extent in Israel, but not in Lebanon and Morocco (only in cases of flagrant disorder to health or public order). The feeling of patriotism contributing to higher compliance is of no relevance in the five countries with the exception of Israel, where this issue plays a minor role.

1.3.6 Knowledge and Technical Feasibility

In many cases, the regulated parties in SWIM region do not understand whichsteps they have to take to achieve compliance with water and environment legislations. Furthermore, they do not often have access to the necessary technology to comply. The lack of knowledge and technology representing a barrier to complianceis not relevant in Egypt, Israel (Conferences are held by the Ministries to present and explain current legislation), Jordan (where the knowledge in the water sector is higher than in the environment sector), Lebanon (where it is more the lack of financial and human resources which is the barrier) and Morocco. With the exception of Morocco (Ministry publishes information brochures and leaflets, radio and television campaigns are carried out), education, outreach and technical assistance provided to regulated parties to enable them to comply with legislation, needs to be enhanced in all five countries. In many cases, technology is representing an additional barrier to comply with water and environment regulations. This barrier can be removed if the national or local competent enforcement authorities are providing awareness, outreach and technical assistance to the regulated parties.

1.4 Overall Assessment – compliance with water/environmental legislation

1.4.1 Level of compliance with water/environmental legislation

Major differences in the level of compliance with water and environmental legislation among the five focus countries were identified. These differences can be attributed partly due to differences in water or environmental legislation and partly due to different answers provided by interviewees from different national institutions.

In Israel, the overall level of compliance with water and water-related environmental legislation in general -is satisfactory; most interviewees assessed the levels of compliance with water legislation to be between 80% and 90%, and with environmental legislation at approximately 70% to 80%.

In Egypt and Morocco, the level of compliance with water and environmental legislation was assessed to be about 50%.

In Lebanon, the level of compliance with water and environmental legislation is still estimated to bewaybelow 50 %.

In Jordan, there is a consensus among all interviewees that compliance with water and environmental legislation needs to be enhanced (compliance was indicated between 25 and 50%, only Jordan Valley Authority (JVA) assessed it with 75%); the expectations are more positive for the water than the environment sector.

1.4.2 Main challenges, gaps and constraints towards improved compliance

The following main challenges, gaps and constraints have been identified.

In Egypt and Israel, economic affordability to comply with regulations, lack of economic incentives, lack of horizontal coordination and inadequate reporting systems(for Egypt only) were identified as the major constraints towards better compliance with water and environment legislations.

In Israel, the shortage of professional manpower in the water sector poses an imminent and persisting problem; the coordination between the governmental bodies' databases is lacking. Furthermore, the fragmentation, overlap and duplication of legislations are identified as serious problems in Israel.

In Jordan, the main challenges, gaps and constraints towards compliance are seen in the lack of clear requirements for compliance for various sectors, the lack of awareness of impact of non-compliance on competitiveness and economic feasibility and the low water tariffs.

In Lebanon, the main challenges and constraints can be attributed to the lack of awareness, lack of financial resources and incentives, lack of coordination between different governmental sectors, overlap of certain legislations and lack of technical capabilities.

In Morocco, the main challenges and constraints to be addressed to improve compliance with the legislation on water and environment relate to the effective management of responsibilities by stakeholders (including the water police and environment inspectors), the lack of awareness of water issues and the environment, the economic cost to comply with the regulations on water and the environment, the lack of cross-coordination of the authorities responsible for the implementation of regulations and the weakness of the judicial system, including judges for acts of non-compliance in the areas of water and the environment.

1.4.3 Identification of opportunities and capacity needed to bridge the gaps

The following general forms of capacity building and/or reform were indicated to be needed to improve compliance with water and environmental legislation in the five concerned countries:

- Enforcement capacity building (Egypt, Israel, Jordan, Lebanon, Morocco)
- Institutional reforms (Egypt, Israel, Jordan. Lebanon)
- Technical capacity building (Egypt, Lebanon)
- Legislative reforms (Egypt, Israel, Jordan, Lebanon)
- Establishment of accredited monitoring & reporting (Egypt,Lebanon, Morocco)
- Develop capacity of water & environment prosecutors and/or judiciary systems (Egypt, Israel, Morocco)
- Establishment of inspectorates (Israel, Jordan, Lebanon)

For Egypt, most of the capacity needed to bridge the compliance gap is of technical nature. Despite the fact that most of the interviewees did not seeknowledge and technicalities as the main barrier, many of them expressed their need of enhanced equipment and expertise in relation to sampling, testing, and quality assurance. Acquiring such equipment/technology will be a good opportunity to enhance the technical capacity of staff involved as they will be provided with extensive training.

For Israel, many of the interviewees suggested that a legislative reform can be useful in improving compliance; more specifically, an enhancement of administrative enforcement tools and extending the application of the regulation tosectors in which the level of regulation is relatively low, such as the rural sector, would be very beneficial to bridge the current gaps.

For Jordan, legal and institutional overlaps and weak coordination and communication among all authorities concerned were identified as main concern by all interviewees. Thus, there is a strong need to restructure the water sector and to finalize the water law and amend the environment law as well as to issue relevant by-laws. Sectoral legislation and guidelines need to be developed starting with priority sectors.

For Lebanon, political will along with strong financial and human resources support isneeded to bridge the gap and achieve compliance.

2 Assessment of enforcement capacity in Selected SWIM-SM COUNTRIES

2.1 Background and introduction

Water and environment legislations, particularly in the form of regulations, will be most effective if they closely reflect the practical preconditions of enforcement. Within such a context, enforcement officials in SWIM-SM PCs should be able to examine and prosecute every suspected violation of which they have knowledge. If after the examination the inspectors determine that there is insufficient evidence to prove the violation or that the violation did not, in fact, occur, they will take no further enforcement action.

In order to achieve maximum compliance with water and environment legislations, technical, human and institutional capacities need to be assessed and developed based on the identified gaps. The assessment of enforcement capacities for compliance with water legislation includes key findings from the analyses of the check-lists and the information captured through deliberations during the training workshop and study tour in Europe. The analysis covered the SWIM-SM region in general and the five countries concerned in particular (Egypt, Israel, Jordan, Lebanon and Morocco).

This chapter provides an overview of the assessment of enforcement capacities and mechanisms to enforce water and environment legislations in terms of constraints, gaps and shortcomings, challenges and opportunities identified in this regard. Information on the monitoring of water and environment compliance including data on types and levels of inspections as well as on the credible evidence for the indictment of violators is provided.

It can be seen from the analysis that in terms of enforcement capacities, modest efforts have been made in the countries in recent years. Details can be derived from the case studies for the five concerned countries. In general terms, enforcement capacities and mechanisms to enforce water and environment legislation are still not sufficiently implemented in the countries and are generally considered as very weak. In any case, compliance with environment and water legislation and enforcement capacities are strongly inter-related. The general public perception that enforcement capacities are weak, inadequate and ineffective is enticing and encouraging noncompliance with water and environmental legislation.

2.2 Monitoring of Water and Environmental Compliance

Following the passage of water and environment regulations, regulating authorities in SWIM-SM PCs will face the need to enforce the adopted regulations and the set of operational standards. Enforcement of these regulations will evidently necessitate the submission of authenticated and unchallenged indictment evidences of violations and noncompliance to the court of law if deemed necessary.

Most of the evidences of indictment will be based on results generated from monitoring systems either in the form of in-situ automated systems or analytical laboratory systems designed for the analysis of water and environment samples.

These analyses will be conducted to either establish or disprove that water and environment quality exceeds the limits set by the regulating authorities. Authenticated evidence is the only means by

which any alleged fact that is being investigated may be established or disproved. Documentation of evidence must be accurate, authenticated by signature or initials and complete.

The results of the survey indicates that national compliance strategy setting out priorities for conducting on-site inspections and other types of compliance monitoring is not available in the five countries of concern. In Egypt there is a wide range of water and environmental monitoring programs, however, a national integrated compliance strategy is not in place. Although the master plan for the water sector in Israel includes provisions regarding the preservation of water resources, a clear national compliance strategy was not established. Although there is no strategy in place in Morocco, it is implicitly defined in the legislation and institutional reforms. Regular inspections whether the relevant water sector has an up-to-date permit or license are conducted in Egypt (on a semi-regular basis), in Israel, in Morocco and for a lesser level in Jordan. Up-to-date permits or licences are not checked in Lebanon. To a certain extent all five focus countries are checking whether water pollution control equipments are installed and whether they are operational. In most cases, government inspectors are authorised to examine log books, records or electronic data and make copies of them and check on the compliance history of the regulated party. Follow-up procedures in case of non-compliance (e.g. more regular inspections and investigations, fines and penalties) are in undertaken in all five focus countries.

The national monitoring systems, in Israel, Jordan, Lebanon and to an insufficient extent in Morocco, include testing laboratories which are adequate for the characterization of pollutants discharged into the water bodies and their potential transformation in the aquatic environment. However, for Israel, it was indicated that hydro-biological monitoring is missing. There are adequate capacities in Israel and partly adequate resources in Morocco to assess releases from point sources; the capacities to assess releases from non-point sources are not sufficient. No adequate resources to assess releases from point and non-point sources are in place in Jordan and Lebanon.

Ambient water quality standards specifying the maximum allowable levels of pollutants in the receiving water medium are in place for most types of waters in all five countries concerned. The standards were determined in the five countries, but are based, inter alia, on international standards (e.gUnited States - Environmental Protection Agency (US-EPA), European Union (EU) directives, World Health Organization (WHO) standards for drinking water and waste water and adjusted for the respective national circumstances. The selection process of ambient water quality standards was participatory in nature involving relevant sectors and stakeholders in Egypt, Jordan, and Morocco as well as to a high level in Israel; but not in Lebanon. In the selection process issues such as techno-economic feasibility and social costs were not given adequate consideration in Egypt, Jordan and Morocco; while in Israel and Lebanon this was taken into account.

2.2.1 Types and levels of Inspection

Inspection is defined as the process by which inspectors determine that a regulated community is in or out of compliance, including examination of records, quality of discharges, and other conditions[11]. It is considered as the backbone of most enforcement programs in SWIM-SM region. Inspections are

[11] UNEP IE/PAC (1992), "From regulations to industry compliance: Building institutional capabilities" Technical report No. 11. UN Publication # ISBN 92-807-1342-X.
<http://www.inece.org/3rdvol1/pdf/wasser1.pdf>.

usually carried-out by government officials such as inspectors affiliated with regulating authorities or independent contracted certified third parties. Inspectors plan inspections, gather data, record and report on their observations, and sometimes make independent judgments about whether the regulated community is in conformity with water and/or environment regulations. This source of compliance information is the most predominating in SWIM-SM region. It conceptually provides the most relevant and reliable information. However, it requires unaffordable extensive budgets, technical and managerial resources to be carefully targeted and planned.To conduct an inspection of a premise, the inspector must have reasonable grounds to believe that, in the premise that he intends to enter and inspect, there are activities, materials, substances, records, books, electronic data or other documents that are subject to the requirements or relevant to their administration.

Guidance to inspect regulated facilities and to gain access to their records, data and equipment to determine if they are in compliance is available in Egypt, Israel, and Jordan (inspection by-law was issued and an inspection manual developed with donors support). This was the case but to a very small extent in Lebanon and Morocco. Requirements for the regulated community to monitor their own compliance, keep records of their conformity and systematically report to enforcement programs are available in Egypt, to a high extent in Israel, to aextremelylimited extent in Lebanon, but not in Morocco.

Guidance was issued to take legal action against non-complying water and environment facilities in Egypt, not sufficiently and only to a very small extent in Israel and Lebanon, but, not in Jordan. Guidance to immediately correct situations that pose an imminent and substantial threat to water resources, public health and the environment was elaborated to a small extent in Egypt, to a better extent in Israel, but not in Jordan or Lebanon.

Regulating authorities is providing training for water and environment inspectors in Israel, Jordan, Lebanon and Morocco; while moderate attention to training is given in Egypt. Insufficient infrastructure including administrative and criminal prosecuting authorities (water and environment police, public prosecutor, municipalities, central government, etc.) is developed in Egypt. In Israel, support for criminal prosecution is missing. In Jordan, Lebanon and Morocco, staffing, financial and human resources remain inadequate. Regulating authorities provide the logistics and support equipment such as vehicles or alternative transportation facilities, field sampling equipment, instruments and gears for rapid field monitoring and assessment through some Ministries in Egypt. This was the general case in Israel and Morocco (with sometimes budget constraints).Provision of logistic support on the part of the government in Lebanon was insufficient. While the level of equipment and logistics were quite high in the water sector in Jordan, however, the environment sector was found lacking these means.

2.2.2 Analysis of Physical Samples of Effluents and Quality of Receiving Water Bodies

Traditionally, prosecutors and judges are very fond of analysis and quantitative measurements. These are considered as “hard facts or evidences”, while oral descriptions of say the biological condition of an aquatic environment are not accorded the same significance in the judiciary systems. In regular situation, an accredited laboratory or remote automated monitoring station will carry out the analyses or measurements. The court is usually not forced to unconditionally accept such measurements. The court habitually attaches great importance to authenticated analyses being carried out as prescribed in the authorization conditions. Issues that might affect the court decision in accepting the evidences include the (1) Precision, accuracy, reproducibility, sensitivity and

detection limit of the measuring methods, (2) Reliability including routine maintenance and operation of sampling gears and measuring instruments (3) Adopted Quality Assurance (QA) and Quality Control (QC) programs including chain of custody and (4) Qualifications, training and competence of inspectors, field and laboratory operators. Furthermore, all aspects related to sampling and analyses procedures should be recorded, dated, authenticated and signed or initiated by the person who will be in a position to testify regarding personal participation in the action and personal knowledge of the facts presented on the signed note page.

In all five countries of concern, regulating authorities identified and established certified measuring systems and laboratories for reliable and comprehensive testing; also functional administrative systems to document, follow-up and keep records of inspections in place in all countries. However, these are not very efficient in Jordan due to the lack of capacity for analysis and reporting.

The regulating authorities hire specialized skilled personnel to conduct direct sampling and analytical measurements of water and wastewater in all five countries concerned; in Jordan, the Ministry of Environment is outsourcing measurements to academia. Many certified testing laboratories that physically analyse samples of water and wastewater effluents according to recognized standard procedures are in place in Egypt, Israel and partly in Jordan. In Lebanon, and despite the presence of central laboratories at the American University in Beirut applying best laboratories practices, certified official monitoring laboratories are not available. Apart from the laboratories dedicated to drinking water and wastewater, laboratories are still in the certification processes for some analyses in Morocco.

2.2.3 Area Monitoring

Area monitoring is another method for regulating authorities to use for monitoring compliance, although much less used than regular & self-monitoring. It consists of using ambient monitoring or remote sensing to monitor water & environment conditions on large scale (lakes, reservoirs, watersheds, in the vicinity of facilities or over large areas).

Area monitoring includes 1- Ambient monitoringto determine quality of water bodies & its suitability for various uses including environmental flows. 2- Remote sensingtechniques are used to detect CC impacts on water resources, provide snap-shots on the general state of environment, etc. and 3- Over-flights can be used to monitor illegal discharges, crop patterns, groundwater reserves, desertification, flood & drought management, etc.

All three techniques are used in Israel (to monitor hot springs in the Kinneret and the Mediterranean Sea) and in Morocco. These techniques are employed at a very limited extent in Jordan; but not used in Egypt or in Lebanon.

2.2.4 Citizen Complaints

The public complaint process is one of the most common mechanisms for public input for the enforcement of water and environment regulations. It usually allows any person to file a complaint with the government regarding activities that are causing harm to water resources or ecological imbalance. Citizen participation in enforcement of legislation through complaints can build a broad-based popular support for what can be controversial enforcement actions. Citizen complaints can be used to unveil and expose non-compliance's that are not detected by inspection or self-monitoring. However, this source of information is often sporadic, non-consistent, and sometimes unreliable.

The mix of compliance information sources used in SWIM-SM PCs varies from one country to another, with inspection by government officials followed by citizen complaints as the most prevailing sources of information. Some SWIM-SM countries found it worthy to develop -with the assistance of NGOs- programs to encourage citizen involvement by providing a financial reward for any citizen complaint that leads to a conviction of the non-complying facility. In Egypt, a hot line was developed to provide citizens and NGOs the opportunity to petition or make a request to regulating authorities if they discover violations of environmental laws or regulations. The Egyptian government has based its decision on the fact that citizens know the country's land and natural attributes more intimately than official inspectors ever will. Their large number makes them more pervasive than the largest enforcement government agency; and seeing citizen as part of the enforcement team also helps shield the regulating agencies from isolation.

In general terms, informing the public (citizens and water consumers) is assessed as insufficient to enforce water legislation in Egypt, Jordan, Lebanon and Morocco. In Israel information is established in general but needs to be increased to a higher level. Very slowly, and far away from a sufficient level, processes are established to consult and/or promote public participation in water management implementation in Egypt and Morocco. Hardly any processes are established in Jordan; practically no information to the public is available in Lebanon. In Israel, processes are generally in place but need to be enhanced. Water and environment regulating authorities allow for public complaints to expose non-compliance with legislations in Egypt, Israel, Lebanon and Morocco, but not in Jordan. Regulating authorities partly established and published telephone hotlines to report obvious non-compliance and violations of water and environment legislations in Egypt, Israel, Jordan and Lebanon, but not in Morocco.In all five countries concerned follow-up procedures for citizen complaints (feedback, official letters) are in place; however they are not assessed to be accurate in Lebanon.

2.3 Credible evidence for the Indictment of Violators

Compliance and enforcement of water and environment requirements will evidently necessitate the submission of authenticated and unchallenged indictment evidences of violations and non-compliance to the court of law if deemed necessary. Most of the evidences of indictment will be based on results generated from monitoring systems either in the form of in-situ automated systems or analytical laboratory systems designed for the analysis of water and environment samples from different matrices.

Regulating bodies consider the following criteria as unchallenged evidence of non-compliance with regulations:

- Inspection reports (applied Egypt, Israel, Jordan, Lebanon, Morocco)
- Recorded personal observations during inspection (applied by Israel, Jordan,Lebanon, Morocco)
- Video recording of the offences (applied by Israel)
- Dated photographs with clear landmarks (applied by Egypt, Israel, Jordan and Lebanon)
- Examination of self-monitoring reports (applied by Egypt and Israel)
- Field notes appropriately dated and signed or initiated (applied by Israel,Jordan, Lebanon, Morocco)

- Specific conversation with identified individuals(applied by Jordan,Lebanon, Morocco)
- The collection of samples at a particular time on a particular day and similar information (applied by Egypt,Jordan, Lebanon, Morocco)

2.3.1 Sampling and Analysis

In furnishing credible evidences for non-compliance with water and environment regulations, monitoring and measuring systems should give adequate consideration to the validity of their data by fulfilling the following criteria:

- Precision, accuracy and reproducibility of the analytical methods (applied in Egypt, Israel, Jordan, Morocco)
- Sensitivity and detection limit of the analytical methods (applied in Egypt, Israel, Jordan and Morocco)
- Reliability including routine maintenance and operation of sampling gears, measuring instruments (applied in Egypt, Israel, Jordan, Morocco)
- Adopted QA/QC programs (applied in Egypt, Israel, Jordan and Morocco)
- Chain of custody (not applied)
- Qualifications, training and competence of inspectors, field and laboratory operators (applied in Egypt, Israel, Jordan)
- Proper documentation of sampling and analyses procedures are recorded, dated, and signed or initiated by the person who is in a position to testify regarding the presented facts (applied in Egypt, Israel, Jordan)

2.3.2 Implementation of a Flawless Chain of Custody

In order to make environmental analysis admissible to the Court of law and utilized in the legal proceedings, they should be subject to a very tight chain of custody to avoid tampering allegations. Proper chain of custody procedures allow the possession and handling of environmental samples (similar to forensic evidences) to be traced and identified at any moment, from the time that sample containers are initially prepared for sampling, to the final disposition of the sample.

The water and environment regulating bodies request the adoption of chain of custody to ensure integrity of reported information in Israel (laboratories strictly follow procedures regarding all aspects of collection and analysis including, inter alia, the chain of custody) and Morocco as well as to a certain extent in Lebanon. A very weak understanding of the chain of custody was noticed in Jordan. In Egypt, chain of custody is not applied reducing the chances of indictment for violations to water and environment legislations in the courts of law.

2.3.3 Reporting and Documentation

The water and environment regulating bodies request reports documenting specific details on water and/or environmental sample submitted for analysis such as:

- Sample collection date; time; locations (applied in Egypt, Israel, Jordan, Lebanon and Morocco)
- Hydrographic circulation patterns or flow (applied in Egypt, Israel, Jordan and Morocco)
- Methods of collection; and collector (applied in Egypt, Israel, Jordan, Lebanon and Morocco)

- Method of transportation (applied in Egypt, Israel, Jordan, Lebanon and Morocco)
- Means of storage (applied in Egypt, Israel, Jordan, Lebanon and Morocco)
- Methods of analysis (applied in Egypt, Israel, Jordan, Lebanon and Morocco)
- Methods of calibrations, quality assurance, quality control (applied in Egypt, Israel, Jordan, Lebanon and Morocco)
- Chain-of-custody and security (applied in Israel and Morocco)
- Elapsed time from sample collection (Egypt, Israel, Jordan, Morocco)
- Test results including quality control results such as field and laboratory blanks, duplicates, replicates, spikes and controls (Egypt, Israel, Jordan, Morocco)
- All calculations that impact test results and interpretation such as instrument calibrations, detection limits, method's sensitivity and standards preparation (Egypt, Israel, Jordan)
- Inter and intra laboratory calibrations of measurements are of no relevance in the five countries concerned.

A regular and transparent exchange of environmental information as established and foreseen in water legislation (e.g. data on water quality published on web-pages) is in place in Egypt and Israel (regular water quality reports for the entire country of Israel are published on a webpage, status of beaches reported on a weekly basis). As for the water sector in Jordan, regular disclosure of information is not practiced for health and environment sectors. In Morocco; a very weak exchange of information isnoticed, while this exchange is hardly conducted in Lebanon. A national water information system to be used as information tool for citizens to inform about the status of "their" waters and for compliance checking is to a high extent in place in Israel and Morocco; such a national water information system is not available in Egypt, Jordan (with the exception of the Jordan Valley Authority) and Lebanon.

2.3.4 Expert and Witness Testimony

Expert testimony is some sort of evidence presented by a person agreed to be an expert on the subject in question by the opposing sides and the court because of education, qualification, training, or knowledge of the subject matter. Water and environment regulating bodies accept an expert testimony on alleged facts presented in a non-compliance case in Lebanon and Morocco and whenever applicable in Israel. It is not very common but allowed and some entities have already pre-approved experts in place in Jordan. Egypt is usually reluctant on accepting an expert testimony on alleged facts presented in cases of non-compliance.

2.4 Overall Assessment of capacities to enforce water and environmental legislations

2.4.1 Available capacities for the enforcement of water and environmentallegislation

Generally, it can be stated that the level of available capacities to enforce water and environmental legislation in some SWIM countries is rather low (and even lower than compliance with water and environment legislation) and needs further enhancement.

In any case, compliance and enforcement are strongly inter-related, because the current public awareness of the low enforcement capacities does not enhance compliance with water and environmental legislation.

In *Lebanon*, enforcement capacities are assessed as “weak”;

In Egypt the level of available enforcement capacities were assessed at no more than 30 %.The low level of available enforcement capacities in Egypt are mainly attributed to the lack of political power of the respective Ministries.

In Morocco,the enforcement capacity was assessed at 50%.

InIsrael, although the level of compliance with water legislation is slightly higher, the general feeling is that the level of enforcement in the environmental sector is better, mainly due to more flexible enforcement tools and the ability to impose financial sanctions.

In Jordan, the level of available enforcement capacities is higher in the water than the environment sector according to interviewed institutions.

2.4.2 Main challenges, gaps and constraints towards improved enforcementcapacities

In Egypt, the legal and technical capacity of inspectors was identified as an issue that needs enhancement.

InIsrael, the main gap in current water legislation is the lack of exercisable and proportionate sanctions and enforcement capabilities. Enforcement is not sufficiently addressed in water legislation. The Water Law provides “draconian tools”, such as license revoking and criminal offences, that are very severe and therefore rarely used. In addition, fines and penalties that are imposed through criminal proceedings, involve complex and long litigation. These proceedings take time and do not allow for a swift response. There are not enough intermediate and proportionate sanctions, such as administrative fines, that will enable the regulating authorities to enforce compliance with the provisions of the law. The result is sub-enforcement and un-deterring punishments. There are not enough administrative powers and no sufficient support from the criminal prosecution authorities.

In Jordan, the main challenges towards improved enforcement capacities are seen in the legal overlaps and weak institutional coordination as well as the lack of qualified staff.

In Lebanon, the interviewed officials reported the same problems towards improved enforcement capacity which are the lack of up-to-date legislation and lack of institutional capabilities.

In Morocco, the enforcement of water and environment legislation is partially exercised. The reasons are manifold and can be summarised as follows: only health consequences and matters of threat to the public order are currently recognized as applying to motivate stringent laws for the protection of water resources and the environment. The water police do not have full authority to exercise control on compliance. In addition, it only has very limited human and financial resources to enforce regulations.

2.4.3 Identification of opportunities and capacity needed to bridge the gaps

The same technical capacity needed to assure compliance in **Egypt** would also help in enforcement, but is of secondary importance compared to political power. An institutional reform may be needed to reassign and redistribute power to enhance law enforcement.

Almost all interviewees from **Israel** pointed out that enforcement capacity building is direly required in order to improve the compliance with water and environment legislations. The majority of the interviewees also believe that increasing the number of professional and well trained inspectors in the water and environment sectors will significantly improve the enforcement.

Jordan also indicated the need for the establishment and/or strengthening of independent inspectorates in various ministries based on clear mandates and functions. Cross-agency coordination and cooperation need to be ensured on top level (as in the National Water Council) in order to guarantee a cascaded vision and policy directives on the operational level of water management. A comprehensive strategy and operational plan focusing on the management of water resources and wastewater effluents need to be elaborated including a multi-ministerial platform (task force or committee) for implementation and a national risk-based water monitoring and inspection program.

As for **Lebanon**, legislative and institutional reforms are seen as the fundamental pillars towards better enforcement of water and environmental legislations.

The current weak situation of the water police in **Morocco** can only be changed if the mandate, the human and financial resources are clearly allocated to the water police in order to enforce legislation without any limitations.

3 Guidelines for improving compliance with water legislations in SWIM-PCs

3.1 Background and Introduction

As revealed from the surveyed SWIM-SM countries and the long study tour discussions in Europe, SWIM-SM countries have practically based their sustainable water resources and environmental management strategies on legal requirements (laws, by-laws, regulations, operation standards, etc.) that must be met by various water relevant sectors. These legal requirements represent the most important foundation for the effective implementation of IWRM plans. Nevertheless, these legal requirements represent only the first step. The more important second step is compliance, i.e. getting the regulated water sectors to comply by fully implementing the requirements. Unfortunately, compliance does not occur automatically once legal requirements are issued. Achieving compliance usually involves efforts to promote, encourage, and ultimately compel the behavioral changes needed to achieve compliance.

If regulating authorities in SWIM-SM countries fail to ensure compliance, they will jeopardize their own credibility as well as the validity of the promulgated legislations. Without acceptable compliance, these legislations will become "paper-tiger" or "straw-man" i.e. just words on paper with no actual improvement in water resources and/or environmental management.

There is no magic formula for achieving compliance. There is merely trial, evaluation, and response to what works and does not work in the particular socio-economic and bio-geo-physical settings of each SWIM-SM country.

Compliance means the state of conformity with water and environment laws[12]. It occurs only when water and environment legislationsare met and desired changes are achieved. If the water and environment legislation are poorly designed, then achieving compliance and/or desired results will be hard if not impossible. It is traditionally known that in order to secure compliance, governments of the region should ideally take the following four consecutive steps:

a) Issue the required water and environment requirements (laws, legislation, acts, and codes of conduct, etc.).

b) Promote compliance through communication of legislation, publication of relevant information, consultation with affected parties, provision of technical assistance to affected parties, etc.

c) Create an enabling environment for compliance including motivation of the regulated community to comply.

d) Enforce the legislation (to be addressed in details in chapter 4) through the following:

- Development of the inspection capacities, credible monitoring, and accredited measuring systems to verify compliance,
- Preparation of procedures for investigations of violations and rules for assessment of penalties,

[12] Ibid 3

- Identification of the measures taken to compel compliance without resorting to formal court action, such as directions by inspectors, ticketing, and Ministerial orders, and
- Development of measures to compel compliance through court action, such as injunctions, prosecution, court orders upon conviction and civil suit for recovery of costs.

The first step in fostering compliance is to ensure that the water and environmental regulations themselves are enforceable, that laws provide the necessary authorities for enforcement and that requirements are clear and practical[13]. Unfortunately, the legal requirements and legislations promulgated by SWIM-SM PCs were often found to be inadequate, fragmented, technically inappropriate, or economically unaffordable, and ultimately suffered from noncompliance.

Deterrence is among the factors found to influence environmental compliance. It is not genuinely practiced in SWIM-SM region. The modality of eliminating economic gains resulting from noncompliance is hardly practiced in SWIM-SM countries. In addition, clear methodology for penalty calculation that would incorporate deterrence, or minimization of economic gain, is often overlooked. Furthermore, in many countries of the region, lack of institutional credibility, political power, and adequate resources on the side of the regulating parties, and the lack of knowledge and technology on the side of the regulated parties, are representing additional hurdles to compliance.Meanwhile, social and personal relationships, especially the friendly relationships between enforcement programs supervisors and managers, play a pronounced role in securing compliance with water and environment regulations in many SWIM-SM PCs. Psychological factors, like inertia, and fear of change, were also identified as major factors in explaining noncompliance.

In an effortto ensure compliance with regulations, SWIM-SM PCs adoptedvarious approaches to manage water resources including the associated environmental flow. The voluntary approach, that encourages or assists change without explicitly requiring it, is hardly applied in SWIM-SM region. The Command and Control Approach was indicated as the most preferred and prevailing water resources and environmental management formula in the SWIM-SM region. This approach, which consists of developing requirements, promoting, and finally enforcing compliance with the regulations, was adopted from the Western school of thought. Unfortunately, this approach failed to produce the desired results in many SWIM-SM PCs, especially because most of the effort was allocated to develop the command measures, while, neglecting the much more demanding control measures. Experience from other parts of the world indicates that the command and control approach can be perfected by supplementing it with other management approaches such as: market based/economic incentives approach that uses market forces to induce behavioral changes. This supplemental management approach was found to be marginally applied by very few countries in the region. The Risk-Based Approach, which establishes priorities for compliance and enforcement, based on the potential risks to water resources and/or environment, is used only by very few SWIM-SM countries.

All SWIM-SM PCs have issued water and environment legislations giving various degrees of authority to the regulating agencies, and establishing some institutional framework for enforcement.

[13]Office of Enforcement and Compliance Assurance United States Environmental Protection Agency (US-EPA) (September 2000) "Profile of the Agricultural Chemical, Pesticide, and Fertilizer Industry". http://www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/agchem.pdf.

However, some of these legislations were non-consistent, fragmented, overlapping, and sometimes conflicting with existing ones.

Most of the legislations currently used by SWIM-SM PCs, are interpreted in by-laws, regulations and requirements in the form of rules and limits for water resources allocations, groundwater withdrawal, protection of water resources through the promulgation of ambient standards, which set maximum allowable levels of pollutants in the receiving aquatic medium. Performance (discharge of effluent) standards, which limit the amount of particular pollutants that can released to surface or groundwater, come next in importance to ambient standards in SWIM-SM PCs. The implementation of technology standards, which require the regulated community to use a particular type of technology, isnot considered by most SWIM-SM PCs. However, practice standards that require or prohibit certain work activities that have significant impactson water and/or environment, are widely recognized and implemented. Requirements for reporting information through self-monitoring, self-inspection, and self-reporting programs are not common in most of SWIM-SM countries. On the other hand, requirements for permits and licenses, which control activities related to construction or operation of facilities that generate pollutants, are widely used as effective enforcement tools both at the national and local levels in SWIM-SM countries.

Water and environment regulations will be most effective if they are implementable, in terms of being clear, understandable, accurate, precise in defining the requirements, and flexible. In order to ensure enforceability, SWIM-SM PCs should improve the social climate for compliance, identify the size of the regulated community, analyze the ability to comply without adding a burden on the regulated party, involve the regulated community and other stakeholders, and the enforcement officials in developing the enacted regulations.

In this chapter, a suggested six steps guideline is devised for SWIM-SM countries towards improving their compliance with their enacted water and environment legislations. The suggested guidelines were developed while considering the specificities of the region, the outcomes of the survey conducted in the five focus countries and the deliberations undertaken during the 18 days study tours involving 28 mid-carrier specialists, representatives of 8 SWIM-SM countries. Fundamental elements for the enforcement of the enacted legislations will be detailed in an enforcement guideline in the next chapter (Chapter IV).

The suggested guideline consists of six fundamental elements according to the following logic sequence:

- **STEP I** - Identify the management approaches that ensure compliance with water and environment legislations.
- **STEP II**- Create regulations that commensurate with the command & control approach
- **STEP III**-Communicate requirements and their means of compliance
- **STEP IV**- Create an enabling environment for compliance
- **STEP V**- Motivate the regulated community to comply
- **STEP VI**- Monitor compliance

STEP I Identify the management approaches that ensure compliancewith water and environment legislations

The need for and scope of compliance partially rest upon which water and environment management approach or combination of approaches is being used in a specific country. Therefore, the first step to consider in designing a guideline to improve compliance with water and environment legislations is to identify the best management approach or mix of approaches that culminate into maximum possible degree of conformity. The identification of management systems that ensure compliance should be based on the technical, financial, human and institutional capacities characterizing the country. Major factors that should also be considered are the degree of public awareness, discipline, behavior and education in addition to cultural aspects and social norms. The suggested management approaches for water resources and environmental management shall be discussed in terms of their feasibility in SWIM-SM countries. The command and control approach will be addressed in the guideline as the fundamental management approach widely practiced in all SWIM-SM countries. Command and control approaches can be reinforced and supplemented by a combination of other approaches such as risk-based approaches, market-based economic incentive approaches, participatory approaches, etc. The supplemental approaches will also be assessed and elaborated further in the following section of the guidelines.This will be followed by an analysis of their effectiveness in reaching compliance with the promulgated legislations. Towards this end, the following management approach or mix of approaches should be considered[14].

STEP I-1 Command & Control Approach

In the command and control approach, the government regulator prescribes the desired changes through detailed requirements, promotesconformity with these requirements and finally enforces compliance. In SWIM-SM countries, command and control approach is the most preferred and prevailing water and environment management approach. In this connection, SWIM-SM countries can perfect the implementation of this approach:

By developing an extensive and well-designed series of feasible water and environment laws and acts (**command** - requirements),

By promoting compliance with these requirements, and then,

By establishing the appropriate inspection and monitoring capacities needed for their enforcement (**control** systems).

Given these facts, the author will follow the same logic sequence in designing the suggested guidelines. The selected management approach will be supplemented by the insertion of tools and measures that would further catalyze, encourage and promote compliance. In this connection, experience gained from around the world indicates that command and control were not the ultimate solution for the proper management of water and environment unless supplemented with additional approaches as illustrated below.

[14] Ibid 3

STEP I-2 Voluntary Approach

This approach encourages or assists change, but does not require it[15]. It heavily relies upon public education, degree of discipline, technical assistance, and the promotion of water and environment leadership by members of the regulated community and NGOs. Successful voluntary compliance programs allow governments' always limited resources to (1) be focused on poorer performing sectors, (2) build support for enforcement efforts, and (3) help embed water and environment concerns in the regulated community, making it less likely that to violate the promulgated water and environment legislations[16]. Unfortunately, this approach is hardly used in the SWIM-SM region.

STEP I-3 Market Based/Economic Incentive Approach

Market based/economic incentive approaches use market forces to achieve desired behavioral changes[17]. In the developed World, economic instruments as opposed to regulatory (command and control) measures have been met with increased interest as a means of implementing the users and polluter-pays-principles. However, these approaches can be independent of, or build upon and supplement command and control approaches. For example, introducing market forces into a command and control approach can encourage greater compliance with the promulgated water and environment regulations, realize the economic dimension of IWRM concept and provide an economic solution to sustainable development problems.

The efficiency of market dis-incentives lies in achieving full costing at the micro-economic level, thus permitting individual water users and/or polluters to choose among a range of alternatives in matching costs with benefits. There are however, limits to the useful application of economic instruments. Command and control measures would have to be applied where acute, high-risk effects require immediate action rather than time lagged prompting through incentives.

The main instruments that can provide economic dis-incentives to the regulated community can fall into one of the following categories:

- Fee system and tariffs, such as cost of service delivery, progressive water tariff, discharge taxes, effluents and other environmental releases.
- Tradable permits, which allow farmers and/or Water Users Associations (WUAs) conserving their allocated share of water resources to trade their saved allocations with other farmers.
- Auctions. In this approach, the WUAs auction limited rights to use some of their allocated water resources.

STEP I-4 Risk-based Approach

Risk-based approach in water and environmental management is relatively new. This approach establishes priorities for compliance and enforcement based on the potential for reducing the risks

[15] Ibid 4

[16] Leroy, Paddock, (1996), "Stimulating voluntary compliance: New policy directions in the United States: The Minnesota experience" In "Fourth International Conference on Environmental Compliance and Enforcement" April 22-26 in Chiang Mai, Thailand.
http://yosemite.epa.gov/ee/epalib/eelib.nsf/4b06bcc40bc939f285256a290076a56e/b01f0587eee2eef985256aa000488bc7!Open Document.

[17] Ibid 4

posed to water resources and/or the environment[18]. This approach is hardly used in SWIM-SM countries for various reasons.

STEP II Createregulations that commonsurate with thecommand & controlapproach

At the heart of regulatory command & control approaches are regulations and/or requirements[19]. These are defined as specific practices and procedures required by law to properly manage water resources and directly or indirectly protect its quality and prevent its pollution. In case compliance with these requirements is notachieved, enforcement as a second stage will evidently be required[20].

The first step in fostering compliance is to ensure that the issued requirements themselves are economically feasible, technically applicable and socially acceptable. Furthermore, the laws should also be providing the necessary authorities for enforcement, and that requirements are clear and practical. The practicality and acceptability of the requirements have great impact on the effectiveness and on the ultimate level of compliance. For instance, command and control management programs that do not have adequate legal authority will generally be ineffective. Requirements that rely on expensive, unreliable, or unavailable technologies will be difficult or impossible to comply with. Requirements that are unclear, imprecise, ambiguous, or contradictory may be difficult to comply with.

This chapter (step II of the guideline) describes how SWIM-SM countries can step by step develop a legislative command and control framework that would culminate in a higher degree of compliance.

In many cases, the ease and cost of compliance greatly affect the degree of compliance. Despite the sincere desire of the regulated community to comply, it will not be able to if the requirements are too expensive or the necessary technologies are unknown or not available. It is then up to the regulating authorities in each SWIM-SM country to balance between the desire to create stringent (using Dracolian laws) and ambitious requirements on one hand and the burden the requirements will create for the regulated community on the other.

Step II-1 Formulate Water and Environment Laws

Water and environment laws provide the vision, scope, and authority for protection of water resources and for environmental restoration. These laws will be most effective if they provide the authorities necessary for their own enforcement. Compliance will not be achieved and credibility of enforcement programs will be eroded if violators can successfully challenge the enforcement authorities21. Ideally, water and environment law should provide regulating agencies with the following authorities:

[18]Kolluru, R., S. Bartell, R. Pitblado and S. Stricoff, (1996), "Risk assessment and management handbook for environmental health and safety professionals" McGraw-Hill, Inc.
http://www.amazon.com/Risk-Assessment-Management-Handbook-Environmental/dp/0070359873
[19] Ibid 3
[20]Bina, B., (1996), "An integrated approach to environmental enforcement – A case study" In "Fourth International Conference on Environmental Compliance and Enforcement" April 22-26 in Chiang Mai, Thailand.
http://yosemite.epa.gov/ee/epalib/eelib.nsf/4b06bcc40bc939f285256a290076a56e/b01f0587eee2eef985256aa000488bc7!Open Document.
[21]Vasquez,R. (1996), "The impact of driving forces on environmental compliance and enforcement programs – The Philippine experience", In "Fourth International Conference on Environmental Compliance and Enforcement" April 22-26 in Chiang Mai, Thailand.

- Authority to issue regulations and guidance to implement the law.
- Authority to inspect regulated community and gain access to their records, data and equipment to determine if they are in conformity.
- Authority to require regulated community to monitor their own compliance, keep records of their conformity and report it regularly and systematically to enforcement program.
- Authority to take legal action against non-complying facilities.
- Authority to correct situations that pose an imminent and substantial threat to water resources, public health and/or the environment.

Step II-2 Issue water and Environment Regulations

Regulations establish in greater detail than can be specified by water and environment laws the general requirements that must be met by the regulated community. This might include requirements in the form of operational standards and directives on how water resources can be allocated, protected, metered, tested for harmful substances, records are registered, data is handled, discharges in water bodies are controlled and monitored[22].

Step II-3 Issue Permits and Licenses

Permits are usually designed to control all activities that use water resources and/or discharges pollutants into water bodies. The requirements in permits are often based on specific criteria established in laws and regulations. Licenses are similar to permits but issued to manufacture, test, sell and/or distribute a product that might affect water resources, such as pesticide, herbicide, etc. that may pose a threat to water uses and quality[23].

It is important for regulating authorities in SWIM-SM countries to note that the requirements in all forms (laws, regulations, permits and licenses), will be effective only if they closely reflect the practical realities of compliance and enforcement in the country. Ideally, regulations should fulfill the following sequence of provisions to end-up with an enforcement action:

1. Are clear and understandable
2. Accurately define what water and/or environment activities are subject to the regulation.
3. Precisely define the regulations and the conditions for any exceptions or deviation.
4. Clearly define how compliance is to be achieved by specifying methods and procedures.
5. Clearly state deadlines for compliance.
6. Are flexible enough to be constructively adapted permits or licenses.
7. Are based on control and monitoring technologies that are available, affordable and reliable.

http://yosemite.epa.gov/ee/epalib/eelib.nsf/4b06bcc40bc939f285256a290076a56e/b01f0587eee2eef985256aa000488bc7!Open Document

[22] United Nations Environment Program (February 2010) "Guidelines for the Development of National Legislation on Access to Information, Public Participation and Access to Justice in Environmental Matters Adopted by the Governing Council of the in decision SS.XI/5, part A of 26.
http://www.unep.org/civil-society/Portals/24105/documents/Guidelines/GUIDELINES_TO_ACCESS_TO_ENV_INFO_2.pdf

[23] UNEP and UNDP (2013) The Role of Legal Instruments to Support Green Low-Emission and Climate-Resilient Development, A Guidebook on Assessing, Selecting and Implementing Legal Instruments. (Page 34-35), http://www.unep.org/delc/Portals/119/publications/Role_Legal_Instruments_Climate_Resilient.pdf.

8. Are drafted clear enough to be the basis of criminal prosecution (considered as the most serious enforcement action).

STEP IIICommunicate therequirements and their means of compliance

Once created, raising awareness and publicizing promulgated water and environment requirements and promoting means for their compliance are always considered as an inherent part of any successful water management strategy. Compliance promotion through communication is defined as any activity that encourages voluntary compliance with the requirements. It helps overcome some of the compliance barriers discussed earlier. Any successful compliance strategies need to involve both promotion and enforcement of the requirements. Policymakers in SWIM-SM PCs will need to determine and implement the most effective mix of compliance promotion and enforcement response.

Experience from around the world[24] has shown that communicating, publicizing, disseminating and promoting alone (carrot alone) is often not effective. Enforcement (stick) is important to create a climate in which members of the regulated community will have clear incentives to make use of the opportunities and resources provided by promotion (carrot). Experience has also shown that enforcement alone (stick alone) is not as effective as enforcement combined with promotion (carrot + stick).

This section describes what SWIM-SM PCs can undertake to promote through communication compliance with their water and environment regulations. According to experience from other parts of the world, it is believed that promoting compliance through communication, information, education and other means is an effective tool in securing conformity with the law. As a part of their efforts towards improving compliance with water and environment regulations, regulating authorities in SWIM-SM countries should publicize and promote compliance through a combination of the following measures:

STEP III-1 Byeducation, information dissemination and technical assistance

Education, information dissemination and technical assistance lay the groundwork for higher compliance. They are essential to overcome barriers of ignorance or inability that otherwise lead to noncompliance. Education and technical assistance make it easier and more possible for the regulated communities to conform by providing information about the requirements and the modalities of meeting them. Provision of technical advice helps the regulated parties take the necessary steps for compliance. Education and technical assistance are particularly important in the early imposition stages of new requirement-based program, and whenever the program requirements are amendedand optimally at the very beginning of the grace period. The regulating authorities should publicize and disseminate information on:

1. The parties subject to their requirements,
2. The exact requirements in each case,
3. Why these specific requirements are important?

[24] UNEP, 2010 "Issue of Compliance: Considerations for the International Regime on Access and Benefit Sharing" United Nations Office at Nairobi (UNON) Publishing Services Section.
http://www.unep.org/delc/portals/119/COMPLIANCEandABS.pdf

4. What changes (including technical and managerial reforms) must be made to comply with the requirements?
5. How compliance can be achieved (e.g. what equipment or technologies should be used?) and
6. What is the grace period to comply with the requirements,
7. What are the consequences of not complying?

How the regulating authorities can educate and disseminate the new requirements to the regulated community?

It is important to note that promotion of compliance can be developed or enhanced in SWIM-SM PCs by establishing a communication plan which specifies the type of information that should be communicated, how it should be developed, when it should be released, and how it should be distributed. Similarly, a technical plan can be developed to indicate what technical support should be provided, to whom, and under what circumstances. Meanwhile water and Environment authorities in SWIM-SM PCs should strengthen their cooperation with the National Research Institutions, academia, industries, and International Organizations such as the European Union (EU) and the United Nations (UN) (UNIDO, UNEP, , UNESCO, ILO, IAEA, etc.) to synergize efforts towards better compliance.

The dissemination of information and raising the awareness of the regulated community can be through the following means:

1. Publications: Such as brochures and guidance manuals, created specifically for simple educational purposes, and distributed or made available to regulated groups. These publications provide a simple description of the requirements and should be devoid of any complicated technicalities on the means for compliance.
2. Training Programs: These programs should be designed specifically to educate members of the regulated community about the issued regulations and the means for conformity. This function can be delegated to NGOs if deemed necessary.
3. Conferences: Following the issuance of a specific legislation, the regulating authorities can hold orientation meetings that bring together officials from the regulating authorities, the regulated communities and stakeholders. These conferences can be designed to inform the regulated parties on the content and effective date of the new legislation.
4. Hot-lines: Regulating authorities in SWIM-SM countries can dedicate telephone numbers that the regulated parties can call to ask questions and receive information and technical assistance.
5. Technical Assistance: There are three means by which technical assistance can be provided. **(1)** By trained personnel who are made available by the regulating agency to visit individual members of the regulated community, and assist them taking the necessary changes for compliance. **(2)** By inspectors who provide technical assistance as part of their inspection visits. **(3)** By special assistance programs, set up for example at qualified academic institutions and research centers that provide assistance and act as central resource of information for compliance.
6. Media Announcements: This sort of information can be widely used to disseminate information on compliance through newspapers, social media, television, or radio. This can include non-technical information about requirements, ways to meet requirements, and enforcement activities.
7. Academia: Universities and research institutions can play a pivotal role in educating the regulated community through their conferences and publications.

STEP III-2 Bybuilding public support &partnership

The public can be a powerful associate in promoting compliance with the issued regulations. They can also serve as watchdogs that alert officials to undetected cases of noncompliance. In addition, public support can create a social ethic, a discipline and/or culture of compliance.

Governments of SWIM-SM PCs should consider the idea of providing the authority to members of the public or NGOs to bring citizen suit against non-complying groups. Furthermore, NGOs can independently promote compliance by publicizing information to increase public awareness on water scarcity and environmental problems and to build support and pressure for compliance.

STEP III-3 By Publicizing successstories

Publicizing success stories of compliance, by regulated selected facilities that have been particularly successful in achieving compliance, can provide an incentive for the rest of the regulated community. With the prevailing wave of water and environment concerns and awareness in the SWIM-SM Region, positive publicity about a firm's compliance success can enhance its reputation and public image. It can also create a positive social climate that encourages compliance.

STEP IVCreate an enabling environment forcompliance

The following are proposed approaches (successfully used in other parts of the world)[25] to help ensure that the water and environment requirements developed by SWIM-SM PCs are complied with. These would be through the following:

STEP IV-1 Improve the climate for compliance

Two simple practices that often invite the respect of the regulated community and improve the climate for compliance can be easily practiced by SWIM-SM PCs as follows:

- By demonstrating value through recognized scientific methods to illustrate that the issued requirement will produce measurable improvements in water resources and environmental quality.
- By demonstrating options and feasibility through provision of technical information on means and technologies that will produce compliance.

STEP IV-2 Identify the size of the regulated community

Regulating authorities in SWIM-SM PCs should recognize that the size of the regulated community could influence the program's ability to successfully ensure conformity with requirements. The larger the community, the more difficult compliance will be. It is advisable for the regulating authorities to assess the size of the regulated community to allocate the proportionate resources to ensure acceptable degree of compliance.

STEP IV-3 Analyse the ability to comply

Both economic and technological factors determine how great a burden the new requirement will pose to both the regulating authorities and the regulated community. In such specific cases,

[25] Ibid 3

regulating authorities should commission independent investigations to examine what economic and technological impact regulation will have on that particular regulated community.

STEP IV-4 Involve the regulated communityand other stakeholders in developing the requirements

It is strongly advisable for the regulating authorities in SWIM-SM PCs to involve the regulated community in the process of developing the requirements. This participatory approach helps in the creation of a feeling of ownership, it also support and reduced resistance and conflict. It also makes requirements more practical and therefore set the floor for better compliance.

STEP IV-5 Involve enforcement officials

Involving enforcement officials in developing regulations will add the needed expertise, wisdom, and concerns of both the technical and legal staff involved in ensuring compliance. The enforcement officials in the SWIM-SM region were only requested to enforce the requirements without providing them with the proper legal or technical aspects associated with the issued regulation. This common practice has deprived the regulating authorities lessons learnt by those officials in ensuring compliance with earlier requirements.

STEP IV-6 Verify the feasibility and acceptability of the enacted regulation

Field testing to verify whether the requirements are clear, understandable, cost effective, acceptable and techno-economically feasible, needs to be conducted by the regulating authorities in SWIM-SM PCs.

STEP V Motivate the regulated community to comply

One of the primary goals of the regulating authorities in SWIM-SM countries is to change the present human behavior and discipline so those water and environment requirements are adhered to. Achieving this goal involves motivating the regulated community to comply, removing obstacles that prevent compliance, and overcoming existing factors that encourage non-compliance. The following are some of the means that regulating authorities can undertake to motivate compliance:

STEP V-1 Deter violators

The phenomenon of people changing their normal behavior to avoid a sanction is called deterrence. Penalties deter detected violators from violating again, and it does deter other potential violators by sending a message that they too may experience adverse consequences for their noncompliance[26]. Conceptually, deterrence will be very effective pending the fulfillment of the following preconditions:

1. If environmental violations are very likely to be detected.
2. If the official response to violations is swift.
3. If the official response to violations predictable.
4. If the response includes a proportionate sanction.

[26] Ibid 3

5. If the regulated parties perceive the first four conditions as serious facts.

STEP V-2 Apply consistent economic instruments

The regulated community will be more likely to comply in case (1) where regulators can demonstrate that compliance will save money, or (2) when the government provides some form of subsidy for compliance. To eliminate any economic gain reaped by violating the issued requirements, the monetary penalty for violation should, ideally, at least equal the amount the facility would save by not complying[27]. This deters deliberate economic decisions not to conform, and help treat compliers and violators equally. The general insufficiency of financial incentives to compensate for the extra efforts and lack of serious monetary punishment for noncompliance in many SWIM-SM countries are major factors promoting the persistence of this negative attitude.

An obvious economic reason for compliance is that regulated facilities normally respond to both positive and negative economic incentives[28]. If expected penalties are sufficiently high, the threat of being punished for noncompliance should be an adequate reason for compliance. Regulating authorities can discourage violations of regulations by providing economic incentives for compliance[29].

STEP V-3 Ensure institutional credibility

Each country in the SWIM-SM region has its own social norms concerning compliance with water and environment regulations. These norms derive largely from the credibility of the laws and sincerity of the institutions responsible for their implementation. The regulating authorities in SWIM-SM countries should recognize that their government's willingness to enforce legislation (that is to unequivocally promote compliance and identify and impose legal consequences on those who do not comply) shape and influence the prevailing social values. A goal on the part of SWIM-SM governments is to bring the majority of the regulated community into compliance by sending them a serious message that compliance is imperativewhich, in turn, will lead to a social norm of compliance.

STEP V-4 Profit from the social factors

In SWIM-SM countries the personal and social relationships play a pronounced role in realizing compliance with water and environment legislations. A good number of regulated groupsconformwith the requirements out of their genuine desire to protect the scarce water resources and to improve the environmental quality. Usually, high ranking officials, public figures and managers particularly in small communities fear a loss of prestige that can result if information about their noncompliance is made public. Both promotional efforts to publicize the benefits of compliance and the perception and reality of consequences for noncompliance play an important role in overcoming inertia.

[27] Ibid 10
[28] Cohen, Mark, (1998), "Monitoring and enforcement of environmental policy" New Ideas in Pollution Regulation, World Bank, Washington, D.C.,USA.
http://sitemason.vanderbilt.edu/files/dbRqyQ/monitoring%2520and%2520enforcement%2520working%2520paper1.pdf
[29] UNEP & EEU, (1997),"Economic values and the environment in the developing world" Environmental Economics Series Paper No. 14, UNEP, Nairobi.
http://www.amazon.com/Economic-Values-Environment-Developing-World/dp/1858985005

STEP V-5 Transfer knowledge & technical feasibility

In many cases, the regulated parties do not simply know that they are subject to requirements. They do not usually understand what steps they have to take in order to conform with water and environment regulations. Furthermore, they do not have access to the necessary knowledge and/or technology to comply with the regulations. According to UNEP[30]Scientific information and knowledge constitute a central foundation of effective compliance with and enforcement of environmental obligations.

The lack of knowledge and technology is representing an additional barrier to compliance in many SWIM-SM countries. This barrier can be removed if the regulating authorities are providing education, outreach and technical assistance to the regulated community.

STEP VI Monitor Compliance

Monitoring compliance is the most important element of any enforcement program[31]. According to UNEP[32], environmental sustainability cannot be achieved without authenticated good quality data, monitoring, auditing and accounting for performance.

Monitoring compliance by collecting and analyzing information on the compliance status of the regulated groups is fundamental for the following reasons:

1. It detects and corrects noncompliance
2. It assesses the enforcement program progress
3. It provides evidence to support enforcement actions

Each regulating authority in SWIM-SM countries should start by designing a national compliance strategy. This strategy should be based on the following two basic elements[33]:

Element one involves the establishment of a compliance monitoring program, which sets out the priorities and rationale for conducting on-site inspections and other types of compliance monitoring.

Element two involves the establishment of an enforcement response policy, which details the appropriate level of enforcement action associated with the many ways that a regulation can be violated. This enforcement policy should also detail the principles and rationale for determining the seriousness of various types of violations as factor in assessing penalty amounts

In general there are four main sources of compliance information that regulating authorities in SWIM-SM countries can develop, promote, institutionalize and rely upon. These sources, as they relate to enforcement, will be addressed in much further details in the next chapters (Chapter 4) of the guideline. However, they can be briefly categorized as follows:

[30]UNEP Division of Environmental Law and Conventions,(Nov. 2012), by The World Congress on Justice, Governance and Law for Environmental Sustainability in"Advancing Justice, Governance and Law for Environmental Sustainability" UNON Publishing Services Section, Nairobi.
http://www.unep.org/rio20/Portals/24180/Rio20_Declaration_on_Justice_Gov_n_Law_4_Env_Sustainability.pdf
[31] Ibid 3
[32]Ibid 2
[33] Ibid 3

STEP VI-1 Inspections by program officers

Inspection is defined as the process by which inspectors determine that a facility is in or out of compliance, including examination of water quantity and quality records, quality of discharges, and other conditions[34]. Inspection is considered as the backbone of most enforcement programs in the region. [35]

STEP VI-2 Self-monitoring, self-record-keeping & self-reporting

Self-monitoring, record-keeping, and reporting are three essential ways in which sources can be required to track their own compliance and record or report the results for regulating authorities review[36].

STEP VI-3 Area monitoring byRegulating Agencies

Area monitoring can be another method for the regulating authorities to use for compliance monitoring, although it should be less used than self-monitoring and reporting[37]. It consists of using ambient monitoring, over-flight and/or remote sensing to monitor water resources conditions including quality.

STEP VI-4 Citizen complaints

The public complaint process is one of the most common mechanisms for public input to support compliance. It usually allows any person to file a complaint with the government regarding activities that are over drafting of water resources or causing deterioration in water quality or ecological imbalance[38]. The regulating authorities are then required to look into the matter and provide a response within a relatively short period of time. Citizen participation in ensuring compliance of regulations through complaints can build a broad-based popular support for what can be controversial enforcement actions.

[34] UNEP IE/PAC (1992), "From regulations to industry compliance: Building institutional capabilities" Technical report No. 11. UN Publication # ISBN 92-807-1342-X.
[35]Luc Lavrysen(2009)"The role of national judges in environmental law" Chapter 2 in the "Role of Judiciary in Environmental Governance: Comparative Prospective" (pages 85-122), Publisher Kluwer Law International.
[36]Environmental Protection Agency, USA, (1996), "International comparison of source self-monitoring, reporting, and record-keeping requirements" EPA 68-W2-0026, Washington, D.C.
[37] Ibid, 3
38Casey, S., F. Williams, A. Jay, and S. Bass, (1996), "The evolving role of citizens in environmental enforcement" In "Fourth International Conference on Environmental Compliance and Enforcement" April 22-26 in Chiang Mai, Thailand.
http://yosemite.epa.gov/ee/epalib/eelib.nsf/4b06bcc40bc939f285256a290076a56e/b01f0587eee2eef985256aa000488bc7!Open Document

4 Guidelines for the development of water and environment enforcement capacities in SWIM-SM countries

4.1 Background and introduction

It was unfortunate to note that the lack of comprehensive, cohesive, and effective systems for the enforcement of enacted water and environment legislations in many SWIM-SM PCs has led to very modest degrees of success in achieving compliance with these legislations. It has also been observed that water and environment legislations are often unenforceable because they are either technically inappropriate or economically unaffordable.Briefly, many SWIM-SM countries suffer from ineffective enforcement regulations and measures, such as ill-defined fines and penalties particularly in the publicly owned economic sectors. It became evident that one of the main challenging problems contributing to limited compliance with water and environment legislations in the SWIM-SM region is the lack of a comprehensive, cohesive and effective system for the enforcement of the enacted legislation. In most of the cases, deficiencies in exerting rule of law in the water sector was not necessarily the result of poorly designed laws but to a large extent, the lack of their enforcing capacities and inadequacy of key compelling systems.

As stated earlier, command and control approach was identified as the most preferred and common water and environment management approach in the SWIM region. This approach, which consists of developing requirements and enforcing them, was adopted from the Western school of thought. Despite its success in achieving compliance in the developed world, it failed to attain the desired results in many SWIM-SM countries, especially because more effort was allocated to develop the command measures (laws, by-laws, legislations, regulations, etc.), while neglecting the much more demanding control (enforcement) measures.

If countries of the SWIM region continue to fail enforcing the laws they enact, they will jeopardize their own credibility as well as the validity of the laws. Their sincere efforts in making water and environment policies will be wasted and the enacted laws will become just words on wasted paper with no actual improvement. Overlooking the enforcement of water and environment laws in SWIM-PCs will undoubtedly lead to the spreading of a social norm or a culture implying “non-compliance is tolerated and compliance is not important”.

The first step in fostering compliance is to ensure that the issued requirements are enforceable, that laws provide the necessary authorities for enforcement and that requirements are clear and practical.In order to secure compliance with water and environment legislations, regulating authorities of the SWIM-SM countries should ideally start by taking the steps identified in chapter 3. Meanwhile, in order to enforce these legislations, the following steps need to be followed to put into effect the enacted legislation through the:

- Establishment of a formal inspection structure and develop inspection capacity.
- Establishment of a monitoring and measuring system to verify compliance.
- Ensuring the credibility of the indicting evidences.
- Establishment of an enforcement response system to violations to compel compliance without resorting to formal court action, such as directions by inspectors, ticketing, and Ministerial orders. This should be followed by the development of measures to compel

conformity through court action, such as injunctions, prosecution, court orders upon conviction, and civil suit for recovery of costs.

- Development of a system to assess and incorporate proportionate penalties in the issued ordinance.

Countries in the SWIM-SM region should cooperate to build and support the capacity of courts and tribunals as well as prosecutors, auditors and other related stakeholders at the national, sub-regional and regional levels to implement environmental law and to facilitate exchanges of best practices in order to achieve environmental sustainability by encouraging relevant institutions, such as judicial institutes, to provide continuing education[39].

The present chapter is providing a guideline to support SWIM-SM countries develop adequate enforcement capacities to ensure compliance with water and environment legislations. The five steps proposed guideline is taking into consideration the outcomes of the survey conducted in the five focus countries, the discussions undertaken during the long study tour in Europe and the characteristics of the region.

STEP I Establish and develop the capacity of aninspection system

Inspection can be defined as the process by which inspectors determine that a regulated party is in or out of compliance, including examination of records, meters, quality of water, characteristics of effluents, wastewater discharges, and other conditions[40]. It is considered as the backbone of any enforcement program. Inspections are usually carried-out by government officials such as inspectors affiliated with the regulating authorities or independent contracted accredited third parties. Inspectors plan inspections, gather data, record and report on their observations, and many cases make independent judgments about whether the regulated party is in compliance. Inspection conceptually provides the most relevant and reliable information. However, it requires unaffordable extensive budgets, technical and managerial resources to be carefully targeted and planned.

Inspection may be an announced-routine if there is no reason to suspect the regulated party is not out of compliance, or it can be an unannounced targeted inspection if there is reason to believe that the regulated party is not conforming.

The government inspectors should be given authority to examine water flow meters, discharged effluent in terms of quantity and quality and examine and take samples. Inspectors authorized by the regulating authority may also examine books, records or electronic data and make copies of them. If during an inspection, the inspector discovers a violation, his or her response should be determined by the nature of the offence (including the degree of harm or potential harm to the water resource and/or environmental quality) and by the compliance history of the facility, individual or government agency.

39 Ibid 3

40European Commission, DG ENV (Jan 2013) "Study on possible options for strengtheningthe EU level role in environmental inspectionsand strengthening the Commission's capacity to undertake effective investigations of alleged breaches in EU environment law". Final report, Page 20, http://ec.europa.eu/environment/legal/law/pdf/Environmental%20Inspections.pdf.

Even though regulating authorities in most SWIM-SM countries are efficiently administering an aggregate of monitoring systems, yet their field inspection capacities are quite limited. Additional resources have to be allocated towards establishing and strengthening the capacity needed for the enforcement of the ratified or proposed requirements. Many regulating authorities in the region are currently compelled to amicably resolve water and environment violations using soft contacts due to the present lack of enforceable legal framework. The regulating authorities in SWIM-SM countries should start immediately (concurrent with the development an inspection legal framework) the establishment of an inspectorate accompanied by a clear program of inspections and investigations that are complemented by spot checks. The schedule of inspections in this program should be determined by the risk that the substance or activity presents to the water resources and/or environment, and by the compliance record of the regulated party. The inspection department should be affiliated with the permitting department and with strong links with monitoring and pollution control divisions.

The following is a programmatic (step-by-step) methodology perceived as suitable for SWIM-SM countries towards building the inspection capacity:

STEP I- 1 Locate and mobilizeresources needed to set up an insectorate

The resources that are required to set-up an inspectorate would always be reflecting the size and complexity of the various economic sectors in the specific SWIM-SM country. There are, of course certain fundamental resources needed in order to have at least the beginnings of a functional and effective inspectorate which can carry-out integral inspections. The fundamental infrastructure should include the following[41]:

1. Trained staff to conduct integrated inspections.
2. Infrastructure with administrative and criminal prosecuting authorities (police, public prosecutor, municipalities, central government).
3. Logistics and support equipment - e.g. transportation facilities, field sampling equipment, instruments and gears for rapid field assessments, etc.
4. Accredited laboratories for reliable and authenticated water and environment analysis.
5. A functional administrative system to document, follow-up and keep records of inspections.
6. Documentation equipment including video cameras, flash memories, logbook, and tape recorder to record information and evidence.
7. Safety equipment to protect the inspector from hazards that might be encountered during inspection.

Where human and technical resources are not available for an inspectorate to hire specialized personnel such as in the current situation in many SWIM-SM countries, other alternatives should be explored. For example, reputable private sector might be contracted to do the inspection and auditing work. However, an accreditation, certification and/or inspection systems should also be

41US-EPA Office of Enforcement & Compliance Assurance (August 2002) "Conducting Environmental Compliance Inspections Inspector's Field Manual", International Edition, http://inece.org/manual/English%20Inspectors%20Field%20Manual.pdf.

established to control the quality performance of these contractors according to the approved standards.

STEP I- 2 Identify the functionsof the new inspectorate

The functions of an inspectorate should be catered to the local situation in each individual SWIM-SM country. Factors to be considered in this connection are the existence of laws, standards, guidelines and policies for inspecting, surveying, auditing, licensing, monitoring and enforcement powers. The functions of an inspectorate can be gradually upgraded and properly defined in phases as follows:

1. Present State in SWIM-SM Countries: The current situation in many SWIM-MS countries indicates that there are inadequate comprehensive clear water and environment requirements and operation standards and/or codes of practice. The suggested function of the inspectorate in such a present case should be centered on advising, planning, assisting but not policing.
2. Near Future State in SWIM-SM Countries: In this phase it is assumed that comprehensive water and environment requirements and standards are formulated and the codes of practice are developed and more enforceable prescriptions are insinuated. In such a case, the function of the proposed inspectorate should be less as an adviser that assists only on request and the inspectors will start more as real enforcement officers. As a result, the inspector should advise on inspection and enforcement. The inspector should show that he can be tougher unless changes are made in a proper time (it might be advisable that the inspector be a different person than the one in step 1 above). He should act not as policeman, but he should rather be very strict in his approach, very consistent in action, and very predictable.
3. In the Future: In the future, it is assumed that all permitting, licensing procedures are functioning; laws, requirements and codes of practice are approved and enacted; standards and regulations are known, registration is fully developed. In this case, the inspectorate would require reports, results, actions more or less voluntary but if not, the inspectors start acting like policemen. Strong warnings, tickets should be given, and public prosecutor can be involved.
4. Ultimately: When all enforcement mechanisms are in place, the inspectors would conduct compliance testing either within the inspectorate or via independent accredited third party.

All these functions and especially for step 3 and step 4 require highly skilled and trained inspectors with extensive background in water resources management and/or environmental engineering or science.

STEP I- 3 Identify the functions ofthe proposed inspectorate

The tasks of an inspectorate usually evolve in a number of steps according to their particular situations. These situations might start from where there are no comprehensive requirements (as is the case in most SWIM-SM countries) and an ill-informed regulated community to one in which regulated parties are well informed of their obligations in complying with well-established requirements.

The tasks of an inspectorate will thus vary according to the stage of development of the requirements. But essentially, these functions can be summarized as follows:

1. Provide response and advice to permit applicants, communicate with the licensing authorities during the planning stage of the new projects, or during the preparation of a rehabilitation scheme.
2. Assist the licensing authorities to define the content of the permits.

3. Advise and assist the regulated parties to comply with the regulations on the occasions of the inspection.
4. Define and impose remedial actions if necessary. Apply or recommend sanctions if needed (fine, fees levied against the regulated party corresponding to the amount of money it made while avoiding compliance).
5. Follow-up results of monitoring on the occasion of the inspections and consolidate the results of the monitoring activities.
6. Prepare and maintain records on performed inspections, observations, taken actions, results of measurements, observations, samples analyzed and other relevant information. Videos on compact disks, USBs and sound record keeping are not only essential for effective inspectorate responsibility, but also as material for future enforcement activity (e.g. court case) if systematic violations of a permit occur.
7. Prepare and disseminate updated information to the regulated community on the regulations and on the currently available technologies leading to compliance.
8. It is also important for the inspectorate to play a role in keeping the public informed about the current water and environment situation, water quality, potential hazards, existence of emergency response plans, etc. If kept well informed, the public and NGOs can exert an influential and sometimes silent pressure on the regulated community to ensure that regulations are respected.
9. Finally, it is the implicit task of inspectorates to encourage voluntary compliance by promoting sound water and environment management practices.

STEP I-4 TrainEnvironmenta inspectors

Environmental inspectors require training in a broad range of skills such as technical, legal, administrative and communicationpractices[42]. Very little attention is given to the training of environmental inspectors in many SWIM-SM countries. Most of the training programs are not based on a clear needs identification and gap-filling strategy. They are mostly provided on an ad-hoc basis and not catered or focused to reflect the real obligations related to the enforcement of enacted regulations. The inspectors need to be technically competent in the subjects of inspections they perform, and skilled in obtaining crucial facts and in collecting and preserving credible evidence of noncompliance. They also need to be skilled in working in teams, in effective communications ranging from entry conversations to complex cross-examination and, in serving as expert witnesses at enforcement proceedings and courts of law.

According to the regional survey, these sorts of high skills necessary for sound water and environment inspection programs are scarce in the SWIM-SM region. At this stage it might be advisable to support a regional initiative aiming at the creation of a regional capacity building program for developing

[42]IMPEL Network (March 2003) -European Union Network for the Implementation and Enforcement of Environmental Law "Best Practices Concerning Training and Qualification for Environmental Inspectors". http://www.search.ask.com/web?l=dis&q=Best+Practices+Concerning+Training+and+Qualification+for+Environmental+Inspectors&o=APN10640A&apn_dtid=^BND101^YY^EG&shad=s_0003,s_0047&gct=hp&apn_ptnrs=AG1&d=473-100&lang=en&atb=sysid%3D473%3Aappid%3D100%3Auid%3D711615adcfd16eb3%3Auc2%3D83%3Atypekbn%3Dn8883%3Asrc%3Dhmp%3Ao%3DAPN10640A

capacities in water and environment monitoring, inspection, and auditing for compliance and enforcement of the enacted water and environment regulations.

STEP I- 5 Identify the financial appropriations for the operation of the developedinspectorate

In the developed world, the financial resources required for existing inspectorates, are usually raised through taxes or fees based on the user and polluter pays-principle. However, due to the current circumstances prevailing in the region, it is always advisable that the central governments, through their regulating authorities, start by providing the needed seed resources for the establishment of the inspectorate. There is no reason why over time, a significant proportion of the costs of the inspectorates can be gradually recovered from regulated community through one of the following mechanisms:

1- Permit Charges: In France and the UK, for example, the fees paid by each permit plant cover the costs of inspectorates. In the Netherlands, central government resources provide the financial requirements of the inspectorate.

2- Financial Penalties[43]: Financial penalties for persistent non-compliance, in addition to their deterrent role, can also contribute to the operation costs of an inspectorate. The system of levying fees for excessive use of water resources or discharge means that the regulated facilities exceeding their water allocations or discharging pollutants, in excess of the prescribed discharge standards, should pay an amount of fees according to regulations for eliminating violations and controlling pollution. In this case the violator shall pay the fee within a prescribed period, if not, he shall pay an additional fee for such a delay, or otherwise be taken to the proper court for compulsory enforcement.

Virtually any enforcement program, no matter how adequately funded, will never have enough resources to inspect all regulated facilities. Therefore, the major issue to be considered in creating an inspection program in SWIM-SM countries is how to target the scarce inspection resources to achieve maximum effect. Another strategy for conserving inspection program resources in SWIM-SM countries is to use what has been recognized in USA as “tiered inspection” [44]. In this inspection, regulating authorities will start with the least expensive inspection. If the regulated facility is found to be in violation, the regulating authority will take action to require the facility to correct the violation and conduct self-monitoring & reporting. The same facility will again be subject to more intensive unannounced inspection. This approach is assumed to shift some of the burden of data gathering to the regulated facility. It also postpones resource-intensive inspections until lower-level inspection and monitoring warrant the expense.

STEP II- Establish a monitoring and measuring system toverify compliance

Monitoring compliance is the most important element of any enforcement program[45], [46]. In addition to inspection including sampling and analysis, to be discussed further below, there are three main

[43]Baolin, Hu, (1996), “Enforcement of pollutant discharge fee in China” In “Fourth International Conference on Environmental Compliance and Enforcement” April 22-26 in Chiang Mai, Thailand.
ht*tp://yosemite.epa.gov/ee/epalib/eelib.nsf/4b06bcc40bc939f285256a290076a56e/b01f0587eee2eef985256aa000488bc7!Open Document*
[44]Mackenthun, K.M. & J.I. Bergman, (1991), Environmental Regulations Handbook” Lewis Publishers, Chelsea, Michigan.
[45] Ibid 3

sources of compliance information that regulating authorities in SWIM-SMcountriesshould develop, promote, institutionalize, and rely upon. These sources can be categorized as follows:

Step II-1 Establisha self-monitoring, self-record-keeping & self-reporting System

Self-monitoring, record-keeping, and reporting are three essential ways (for water quality management in particular) in which a regulated party can be required to track their own compliance, record and report the results to the regulating authorities to review[47].

- In self-monitoring, the regulated parties measure discharges or performance parameter that provides information on the nature of discharges or the operation of a control technology. For instance, the regulated facility might be asked by the regulating authorities to sample and measure wastewater effluent or discharge of a certain pollutant into a water body. Regulated facilities may also be asked to monitor operating parameters on flow meters and other water metering control equipment (voltage, electric current used, etc.). These parameters can be used as indicators on water consumption and how well the measuring equipments are operating. This sort of parameters are generally inexpensive to operate, monitor and are more reliable.
- In self-record-keeping, the regulated facility is responsible for maintaining its generated records of a certain regulated activity.
- In self-reporting, the regulated facility is also required to provide the regulating authorities with self-monitoring or record-keeping data periodically and/or upon request.

The self-monitoring, record keeping and reporting provide much more extensive information on compliance than what can be obtained with periodic field inspections. They also shift some of the economic burden of monitoring to the regulated facilities. For instance, the industrial sector, agricultural sector, water and wastewater works sector, etc., should self-monitor, self-record-keep, and self-report on the water and environmental aspects associated with their activities to the regulating authorities.

Self-monitoring requires that reliable and affordable monitoring equipment be available to the regulated facility. Self-monitoring, self-record-keeping, and self-reporting has the disadvantage of relying on the assumed integrity and capability of source to provide accurate and punctual data. It also places a burden on the regulated community and increases the paperwork for compliance program. The data will be misleading if the source either deliberately falsifies the information or lacks the technical capability to provide accurate information. Therefore, it is advisable for the regulating authorities in the SWIM-SM countries when planning to utilize self-reporting, self-record-keeping, and self-reporting to establish a modality to help ensure accuracy. This can be achieved by restricting self-monitoring requirements only to facilities with appropriate technical capability, by developing QA/QC standards and programs for monitoring, record keeping and reporting. Penalties should also be set including severe deterrence for any deliberate deviation from these standards.

[46]Michael Bothe, (2006) "Ensuring Compliance with Multilateral Environmental Agreements – Systems of Inspections and External Monitoring", in Ensuring Compliance with Multilateral Environmental Agreements. A Dialogue between Practitioners and Academia, MartinusNijhof Publishers, p. 247.
[47]Environmental Protection Agency, USA, (1996), "International comparison of source self-monitoring, reporting, and record-keeping requirements" EPA 68-W2-0026, Washington, D.C.

So far, self-monitoring is not a very common practice in SWIM-SM PCs except in very few cases as stated earlier. In Egypt some regulated facilities are compelled to test for their effluent using the capacity available within research institutions and/or universities. This practice is not based on a preplanned strategy for self-monitoring. It is rather based on the fact that neither the local regulating authorities nor the regulated facilities have the needed capacity for monitoring compliance. In case regulating authorities in SWIM-SM countries decide to design and impose self-monitoring to consider and specify the following aspects:

- The standards and limits to be observed,
- parameters to monitor,
- sampling locations,
- sampling frequency,
- standard or approved methods for sampling and analysis,
- minimum acceptable analytical quality control,
- methods for records-keeping,
- frequency and timing of reporting,
- reporting format,
- penalties for not monitoring,
- sanctions for missed or delayed reporting, etc.
- penalties for deliberate falsification of information
- internal QA/QC program for insuring reliability of the generated and reported data

In general, self-monitoring and reporting can be good substitutes for the efforts SWIM-SM governments are exercising for the enforcement of water and environment regulations. They will undoubtedly reduce enforcement costs without compromising deterrence. Self-monitoring and self-reporting do not entirely remove government enforcement costs. Instead, the regulating authorities will have a new type of monitoring to consider, namely scrutinizing and auditing the self-monitoring process and self-reporting content. The objective of the scrutinizing (auditing) task is to verify the validity of the reported information and imposing sanctions if the regulated facility was found to be lying or falsifying information. In this case regulated facilities should be formally informed that they must report any violation of pollution prevention requirements. The magnitude of any imposed penalty should subsequently depend on whether the violation is promptly reported voluntarily or if the regulating authorities discover it when no self-report has been made. For the latter, the imposed penalty should be considerably higher.

All facilities permitted to discharge to water bodies should be required to file regular discharge monitoring reports on a monthly or quarterly basis for all the constituents designated for monitoring as a precondition for the renewal of the discharge permit.

While required self-monitoring and submission of regular discharge monitoring reports are key features of the compliance program that can be suggested for implementation in SWIM-SM PCs, regulated sources also should be subject to periodic on-site inspections by official inspectors from regulating authorities. Owners, managers or operators of discharging facilities discovered to submit

incomplete, inaccurate, or false information should be subject to strict civil or sometimes criminal sanctions.

Step II-2 Utilize area monitoring

Area monitoring is another less expensive method for regulating authorities in SWIM-SM countries to use to enforce compliance, although much less used than regular & self-monitoring. It consists of using ambient monitoring or remote sensing to monitor water & environment conditions on large scale (lakes, reservoirs, watersheds, in the vicinity of facilities or over large areas)

Area monitoring can be used: (1) To assess the overall impacts of certain activities such as building dams, assess storage capacity, survey water quality, delineate lakes morphology, etc. (3) To assess trends at a macro scale (increase in turbidity, erosion, eutrophication, plume delineation, stratification, chlorophyll, etc.). (3) To define the fate, transformation, transport and distribution of pollutants in the water bodies (oil spills, macrophytes, sedimentation, etc. (4) To provide data useful in assessing potential health impacts, risks assessment & communication and (5) To provide a screening device for identifying potential violations particularly where conformity problems may be found.

Area monitoring is very useful in detecting possible violations without entering locations. It also determines whether permits & discharge regulations are providing adequate environmental protection. However, this source of information can also be difficult to establish causality. It is difficult to obtain precise information that can be used as credible evidence in courts of law.

Area monitoring includes 1- ambient monitoring, 2- remote sensing & 3- over-flights.

1. **Ambient monitoring**is to determine quality of water bodies & its suitability for various uses including environmental flows. It is most useful when a source is the only significant polluter in the investigated area or when its wastewater discharges have a characteristic composition that serves to fingerprint them.
2. **Remote sensingtechniques** are not widely used as a regular monitoring technique. It can be used to detect Climate Change (CC) impacts on water resources, provide snap-shots on the general state of environment, etc.
3. **Over-flights** can be used to monitor illegal discharges, irrigated crop patterns, groundwater reserves, desertification, flood & drought management, etc.

STEP II-3 Promote mechanisms for citizen complaints

The public complaint process is one of the most common mechanisms for public input for the enforcement of water & environment legislations. It usually allows any person to file a complaint with the regulating agency regarding activities that are causing water degradation or environmental harm. Citizen complaints are based on the fact that citizens know the country's land & natural attributes more intimately than regulating agency inspectors ever will.Their large number makes them more pervasive than the largest enforcement government agency and seeing citizen as part of the enforcement team helps shield the regulating agencies from isolation.

The government is then required to look into the citizens complaints and provide a response within a relatively short period of time. In developed countries, citizens are also allowed to go a step further

by taking legal action to enforce water & environmental laws, either under specific provisions in environmental laws, or in accordance with administrative or civil codes.

Citizen complaints can be used to unveil & expose non-compliance's that are not detected by inspection or self-monitoring systems. However, this source of information is often sporadic, non-consistent & sometimes unreliable. It might be worthy to develop -with the assistance of NGOs- programs to encourage citizen involvement by providing a financial reward for any citizen complaint that leads to a conviction of non-compliance.

STEP III Ensurecredibility ofindicting evidences

Enforcement of water and environment legislations necessitates the submission of unchallenged indictment evidences of violations and noncompliance to the court of law, if deemed necessary. Most of the evidences of indictment will be based on results generated from inspection and monitoring systems either in the form of in-situ automated monitoring systems or analytical laboratory systems designed for the analysis of water and wastewater samples. These analyses will be conducted to either establish or disprove that the water quantities or quality exceeds the limits set by the regulating authorities. Credible evidence is the only means by which any alleged fact that is being investigated may be established or disproved. Documentation of evidence must be accurate, authenticated by signature or initials and complete. It is therefore important for the regulating authorities in SWIM-SM countries to develop systems that can furnish certified credible evidence for the purpose of legal enforcement of regulations.

Evidence includes everything individual does that is relevant to an issue at hand[48]. It may include such as:

1. Official inspection reports.
2. Recorded personal observations during official inspections appropriately dated & signed or initiated.
3. Video recording of the offences with time & date.
4. Dated photographs including remote sensing with clear landmarks.
5. Examination of self-monitoring reports.
6. Specific conversation with identified witnesses.
7. The collection of samples at a particular time in a particular day & similar information.

Accepting evidence of noncompliance is subject to the following conditions:

1. Documentation of evidence must be accurate, authenticated by signature or initials, dated & complete.
2. A universal rule is that hear-say is inadmissible (hear-say evidence that is based not on a witness' personal firsthand knowledge or direct involvement, but on matters told by others).

[48]UNEP (2009), Judicial Training Modules on Environmental Law, in "Application of environmental law by national courts and Tribunals".The UNEP Global Judges Program, Module 9 (Evidences in Environmental Cases). http://www.unep.org/delc/Portals/119/08_EVIDENCE%20IN%20ENVIRONMENTAL%20CASES.pdf

Traditionally, prosecutors & judges are fond of quantitative analysis & measurements. These are considered as “hard facts or evidences”, while oral descriptions of a damage to aquifers or public health condition are not accorded the same weight. In regular situation, an accredited monitoring system or laboratory will carry out the analyses or measurements. Quantitative values are then interpreted by regulating agency to show compliance or noncompliance with permits to define the need for additional sampling & analysis to confirm violations and/or impose sanctions. The court habitually attaches great importance to analyses being carried out as prescribed in the authorization.

STEP III-1 Ensure integrity of measurements, samplingand analysis

Under normal operating conditions, an accredited or certified laboratory will carry out the analyses or measurements. The court is usually not forced to unconditionally accept such measurements. The court usually attaches great importance to analyses being carried out as prescribed in the authorization conditions. Issues that might affect the court decision in accepting the evidences include the following:

- Precision, accuracy, reproducibility, sensitivity and detection limit of the measuring techniques and analytical methods.
- Reliability including routine maintenance and operation of sampling gears and measuring instruments.
- Adopted Quality Assurance (QA) and Quality Control (QC) programs including chain of custody[49].
- Qualifications, training and competence of inspectors, field and laboratory operators.

Recognized standard analysis and measurement procedures utilized in providing evidences of noncompliance should be recorded and strictly followed. Where it is necessary to deviate from the above plans or standard procedures, the deviation should be recorded and the reason for such a deviation noted. The controlling key word is proper documentation. All aspects related to sampling and analyses procedures should be recorded, dated, and signed or initiated by the person who might be in a position to testify regarding personal participation in the action and personal knowledge of the facts presented on the signed note page. Obviously, regulating authorities monitoring systems should have staff which can provide indisputable certificates of analysis and serve as expert in testimony for prosecution.

STEP III-2 Implement a flawless chain of custody

In order to make environmental analysis admissible to court of law and utilized in the legal proceedings, they should be subject to a very tight chain of custody. Proper chain of custody procedures allow the possession and handling of water and environment samples (evidences) to be traced and identified at any moment, from the time that sample containers are initially prepared for sampling, to the final disposition of the sample. A qualified and officially nominated QA/QC officer

[49]UN/ECE Task Force on Laboratory Quality Management & Accreditation (2002), "TECHNICAL REPORT: GUIDANCE TO OPERATIONOF WATER QUALITYLABORATORIES".
http://www.unece.org/fileadmin/DAM/env/water/publications/documents/guidancelaboratories.pdf.

should manage the chain of custody in monitoring laboratories. The chain-of-custody should include the following:

1. A written record of the laboratory's source and manner of preparation of sample containers should be referenced. This should include the laboratory QA/QC procedures for assuring that the sampling container is clean, ready to accept a sample, properly labeled and of proper size and material. Sample label should be water proofed, marked with indelible ink, and secured to the body of the sample container. They should contain the sample number, preservation technique if applicable, date and time of sample collection, and initials of the collector.
2. A documented procedure for management of sample containers, both in the field and in the laboratory, to prevent either inadvertent contamination or potential opportunities for tampering.
3. The field supervisor should maintain a bound, page marked field logbook in a manner such that field activity can be completely reconstructed without reliance on the memory of the field crew. Items to be noted in the logbook should include the following:
    - Date and time of activity
    - Names of field supervisor and team members
    - Purpose of the sampling exercise
    - Description of the sampling site
    - Location of the sampling site
    - Sampling equipment used and their calibration records
    - Any deviation from standard operating procedures and the justifying reason.
    - Field observations
    - Field measurements made
    - Results of any field measurements
    - Sample identification
    - Type and number of samples collected
    - Sample handling, packaging, labeling, and shipping information
4. The field logbook should be kept in a secure place until a unit effort or activity for which particular logbook is maintained has been completed, whereupon the logbook should be kept in a secure case file.
    - The official QA/QC officer should make sure that chain-of-custody record accompanies each group of samples from the time of collection to their destination at the receiving laboratory. Each person who has custody of the samples at any time must sign the chain-of-custody form and ensure that the samples are not left unattended unless secured properly.
5. Gummed paper custody seals or custody tape should be used to ensure that the seal must be broken when the container is opened.
6. Within the laboratory, security and confidentiality of all stored material should be maintained at all times. This may require that any analyst sign for any sample removed from the refrigerated

storage area for purposes of performing analysis and note the time and date of returning a sample to storage.

7. Before releasing or reporting any measurements or analytical results, all information on sample labels (bar code), data sheets, tracking logs and chain-of-custody records should be crossed checked to ensure that data pertaining to a sample are consistent throughout the record.

STEP III-3 Ensureappropriate documentation

Records should detail all information about water and environment samples including the following[50]:

1. Collection: Date; time; locations; weather conditions; wind direction; hydrographic circulation patterns; methods of collection; and collector.
2. Transportation: Method, chain-of-custody, packing to ensure correct temperature maintenance and security.
3. Laboratory: Means of storage, methods of analysis, calibrations, quality assurance, quality control, chain-of-custody, and security.
4. Testing: elapsed time from sample collection, pre-treatment, standard method identification number and type of test.
5. Test results: including quality control results such as field and laboratory blanks, duplicates, replicates, spikes and controls.
6. All calculations that impact test results and interpretation such as instrument calibrations, detection limits, method's sensitivity and standards preparation.
7. Any observations of a non-routine occurrence that may be important in interpretation of results.
8. Equipment and instrument maintenance, malfunction and calibration.
9. Any deviation from the protocol.

STEP III-4 Develop capacity of expert witness for testimony

Expert testimony is evidence presented by a person where both sides and the court agree that the person is an expert on the subject at issue because of education, qualification, training, or knowledge of the subject matter. An expert may testify on the alleged facts presented in the case or on personal judgment or conclusions based upon similar situations elsewhere with which the witness is familiar in a professional way.

As with all evidences, a witness must describe why, where, who, and what the results were, because the witness saw these occurrences or was personally involved in the act. As stated earlier, a witness cannot testify on something that the witness has heard someone else say. This is because it is based on the sincerity and competence of someone other than the witness himself.

Regulatory agencies responsible for accredited water & environment testing laboratories and monitoring stations should have well qualified staff that can provide indisputable evidences of non-compliance and serve as expert in testimony for prosecution.

[50] Ibid 3

An important part of the essential evidence used to support scientific proof in court cases is the demonstration and documentation of the level of training of the analyst. Much scientific evidence has been refused admission or severely tainted due to a lack of documented training of the "expert witness".

The weaknesses in expert witness training have always been atemptingtargets for raising doubts and Legal challenges in courts of law. Six known weaknesses can be listed including:

1. The expert witness is unqualified to swear for the theory's validity
   - Lack of understanding of the concepts.
   - Lack or insufficiency of theoretical background
2. The expert witness is unqualified to vow for the measuring instrument's reliability.
   - Unfamiliarity with the monitoring instrumentation & techniques
4. The expert witness was unqualified to maintain the monitoring equipments.
5. The expert witness was unqualified to operate the equipment and conduct the test.
   - Whether a credential is required
   - Whether the witness possesses the credential
6. The expert witness did not use prescribed standard procedures in conducting the test.
7. The expert witness is unqualified to interpret the test result.

STEP IV Establish enforcement response system to violations

Enforcement officials should be able to examine every suspected violation of which they have knowledge. If after the examination the inspectors determine that there is insufficient evidence to prove the violation or that the violation did not, in fact, occur, they will take no further enforcement action.

Regulating authorities in SWIM-SM countries should design a system for enforcement response to noncompliance to water and environment legislations based on a set of carefully selected criteria with escalating levels of response.

STEP IV-1 Select criteria to respond to violations

Whenever a violation of water and/or environmental requirements is discovered, enforcement officials in regulating authorities should apply the following criteria [51]when deciding on the kind of enforcement action they must take:

1. **Nature of the violation:** This includes:
   - consideration of the seriousness of the harm or potential harm,
   - the intent of the alleged violator,
   - whether this is a repeated occurrence and

[51] Ibid 3

- whether there are attempts to conceal information or otherwise subvert the objectives and requirements of the act.

2. **Effectiveness in achieving the desired result with the violator:** The desired result is conformity with the water and/or environmental requirements, within the shortest possible time and with no further reoccurrence of violation. Factors to be considered include:
    - the violator's history of compliance with the act,
    - willingness to cooperate with enforcement officials, and
    - evidence of corrective action already taken.
3. **Consistency in enforcement:** Enforcement officials have to insure consistency in their responses to violations. Accordingly, enforcement officials should consider how similar previous situations were handled in the country, in the region and from around the world, when deciding what enforcement action to take.

STEP IV-2 Establish levels of enforcement actions to respond to violations

Inspection or monitoring activities may uncover permit or regulations violations. In establishing levels of enforcement actions to respond to violations, the regulating authorities in SWIM-SM countries might consider instituting the following three gradually increasing levels of legal actions pursuant to the appropriate statute:

IV-2-1 Administrative Actions

Administrative actions may either be informal or formal. The informal administrative actions are basically notices of noncompliance or warning letters issued from the regulating authorities. They are usually advisory in nature. In these actions, the regulated party is advised that a violation have been found, the corrective action needed, and the time within which an action to correct the problem must be instituted. Generally, informal actions carry neither penalty nor power to compel action. However, the records of an informal action can be used to support more severe legal actions when situation is not satisfactorily corrected. The formal administrative actions are legal actions that result in an order requiring the violating party to correct the violations and, in most cases, to pay a civil penalty that commensurate with the seriousness and circumstances of the violation. These administrative actions are strong enforcement tools. If a person violates the terms of an administrative order, a court action may be obtained based on the regulating authority recommendation, to force compliance with the order. Generally, administrative actions are the most expedient means of requiring correction, and they are used in lieu of civil or criminal actions whenever appropriate.

In order to implement administrative actions, It is strongly recommended that the water and environment regulating authorities take these actions under their internal administrative litigation system. This system would be very comparable to any court system, except that it is presided over by regulating authorities' administrative law judges, whose salaries in this case should be paid by the regulating authorities. The legal adviser serving in most regulating authorities in SWIM-SM countries can play this role during the current interim phase. In all cases, these administrative actions should have the potential to be challenged in the SWIM-SM countries legal court systems. Therefore, the conduct of the administrative actions by regulating authorities should be governed by an extensive set of procedural rules designed to provide mature legal processes to the alleged violator and to ensure the integrity of the system. Violators should always have the right to appeal the initial rulings

of the administrative judge to the regulating authority chief administrator, and may appeal the chief administrator's final decision to the proper courts of law.

IV-2-2 Civil Judicial Actions

Civil actions are taken in the SWIM-SM country court system by the country's Ministry of Justice at the request of the regulating authorities. Typically they are used against more serious or recalcitrant violators of water and environment legislations. Generally, they are intended to seek prompt correction of imminent hazard situations posing immediate threat to water resources and/or environment. Preparation of civil judicial cases is resource intensive because of the Ministry of Justice involvement and the more formalized procedures required for court action as compared to administrative actions. The civil judicial action requires efficient and prompt court systems with judges familiar with water and environment issues and requirements. The efficiency of court systems varies widely among SWIM-SM PCs, with some having acceptable efficacy while others are seriously inefficient. However, the number of judges, who are familiar with water and environment laws and requirements in the region, is very insufficient. Civil cases often result in penalties and court orders requiring correction of the violation and also requiring specific actions, such as specialized monitoring to prevent future noncompliance.

IV-2-3 Criminal Judicial Actions

Criminal actions are taken when a regulated party has knowingly and willfully committed a violation of the water and/or environment law. In a criminal case, the regulating authority through the Ministry of Justice should prosecute the alleged violator in a court system, seeking criminal sanctions, usually including fines and incarceration. Criminal actions should be taken only when flagrant, intentional disregard for water and/or environment laws, and/or deliberate falsification, or alteration of possibly incriminating documents or records, occur[52]. The Ministry of Justice usually brings criminal cases at the exclusive request of the regulating authorities. Criminal cases are the most difficult to pursue. In these cases, the regulating authorities in SWIM-SM countries will require sophisticated special investigation and case development procedures and they should involve the highest standard of proof, including proof of intent of the violator to commit the violation. It is also important to note that the ability to apply criminal enforcement in water and environment cases will depend on each SWIM-SM country's legal system and on whether appropriate authority is provided in its enacted water, environment and/or other laws.

Criminal cases, which can include incarceration as one of the penalties, should be the least used of the potential legal actions in SWIM-SM region. However, their mere existence is fundamental to provide more deterring power.

STEP IV-3 Establish measures for responding to violations

Potential adverse consequences of non-compliance should not be restricted to the conventional responses provided beneath. Response to water and environment violations can also include permit provocations, fines, and adversarial relations with regulating authorities, as well as criminal

[52]Luc Lavrysen (2009) "The role of national judges in environmental law" Chapter 2 in the "Role of Judiciary in Environmental Governance: Comparative Prospective" (pages 85-122), Publisher Kluwer Law International.
[52] Ibid 3

prosecution of regulated party officials[53]. The response of the regulated authorities in SWIM-SM countries to violations should include in anprogressing order one of the following regulating measures:

IV-3-Warnings

Regulating authorities' inspectors might consider warnings in the following cases:

- When they believe that a violation of the act is continuing or has occurred; and
- When the degree of harm or potential harm to water resources, environment, human life or health appears to be minimal.

When deciding on whether to use warnings or more severe enforcement action, regulating authorities' inspectors might also consider the following:

- Whether the regulated party has good history of compliance.
- Whether the regulated party has made reasonable efforts to remedy or mitigate the consequences of the offence or further offences.

Warning should be given in writing including the following information:

- The section of the enacted regulation that was violated.
- A description of the alleged offence.
- The time limit within which the regulated party must comply with the warning.
- The statement that if the warning is not heeded, enforcement officials will take further action.

IV-3-2- Directions by Inspectors

Where there is violation to water and/or environment regulations, the regulating authorities inspector may give directions to the regulated party to take all reasonable emergency measures to:

- Remedy any dangerous situations; or
- To reduce any danger to the water resources and/or environment that results from such a violation.

The regulating authority inspectors will not ordinarily issue such directions unless the obligations are not met. The directions should be given in writing. Failure to comply with the directions by regulating authority inspectors should lead to prosecution of the regulated party for this failure. In case of inability to comply with the directions, the inspector should be empowered by the enacted regulations to take the action himself or to hire qualified experts to take the emergency measures at the regulated facility expense.

IV-3-3 Ticketing

The purpose of ticketing is to delineate exact offences, associated fines, and procedures to respond to tickets. The regulating authorities in SWIM-SM countries should designate offences where there is minimal or no threat to water resources and/or environment or human health, as ticketable offences.

The inspector should not issue a ticket unless he determines that a warning is the appropriate response and the offence is a repeated occurrence. Once the regulating authority inspector issues the ticket, the accused party may within a certain time limit stated on the ticket respond in three different ways:

1. Either he pleads guilty and pays the fine to the appropriate court as indicated on the ticket without making a formal court appearance.
2. Or plead guilty with an explanation and appears in court to request lower penalty or additional time to pay the fine.
3. Or submit a plea of not guilty, resulting in formal court proceedings.

If the accused fails to choose an option and does not respond within the time limit, a conviction is then entered against him and the regulating authority should begin proceedings to collect the penalty.

IV-3-4 Injunctions

The director of the regulating authority in SWIM-SM countries should be given the authority to seek an injunction "court order", in order to stop or prevent a violation of a water and/or environment legislation. The inspectors are supposed to carry out inspections to ensure that the regulated party complies with the terms of the injunction.

If the regulated party does not comply with the injunction, the director of the regulating authority should return to the court to seek:

- A contempt "disregard" of court ruling.
- Instruction by the court for the violator to comply within the stated time limit in the injunction.
- Any additional penalty, such as fine or imprisonment that the court may see fit to impose in its contempt of court ruling.

IV-3-5 Prosecution

Regulating authority inspectors should lay a charge for every violation of the enacted regulation unless they determine that:

- A warning is the most appropriate enforcement action
- Issuing a ticket is the most appropriate response

Prosecution should always be pursued in the following cases:

- There is a death of or bodily harm to a person due to the violation.
- There is a serious harm or risk to the water resources, environment, human life or health.
- The alleged violator knowingly provided false or misleading information, or made a false or misleading test of substance in pretended compliance with the enacted regulations.
- The alleged violator obstructed the inspector in carrying out of his or her duties and responsibilities.
- The alleged violator interfered with a evidences seized by an inspector under the enacted regulations.

- The alleged violator concealed or attempted to conceal evidences after the offence occurred.
- The alleged violator did not take all reasonable measures to comply with a direction by an inspector.

IV-3-6 Penalties and Court Orders upon Conviction

Upon the conviction of an offender for a certain violation it is expected that the inspectors from regulating authorities would recommend to the prosecutor the proper penalty to be imposed. The recommended penalty should commensurate with the nature and gravity of the offence. Penalties to be included in the enacted regulations should include fines or imprisonment or both and court orders that accompany a fine or imprisonment. When making such a recommendation with respect to sentencing, the regulating authorities' inspector should apply the following criteria:

- The nature of the violation.
- Effectiveness of the recommended penalty in achieving the desired result with the violator (namely compliance with the regulations and no further reoccurrence of the violation).
- Effectiveness of the recommended penalty in deterring others from committing violations and in ensuring compliance with the statute (general deterrence).

Upon conviction of the violator, regulating authorities' officials may request in their recommended sentence, that the court include one or more of the following orders:

- Prohibit the offender from doing any activity that may result in continuation or repetition of the offence.
- Direct the offender to correct resulting harm or to take measures to avoid potential harm.
- Direct the offender to notify, at the violator's own expenses, any person, company, or government agency adversely affected by the offender's infraction of certain regulations.
- Direct the offender to publish the facts relating to the conviction.
- Direct the offender to compensate the regulating authorities for the costs of the preventive or corrective measures (including cleanup) undertaken by the authorities as a result of the violation.

STEP V- Development of a system to assess andincorporate proportionate penalties

This step is basically designed to assist regulating authorities in the SWIM-SM region defining the appropriate penalties for the settlement of civil and administrative actions. It will also provide them (using a simple numerical example) with the guidelines needed to estimate the lowest penalty figure, which the agencies should accept in an out-of-court settlement. The guideline is designed so that violators whose actions, or inactions, result in a significant economic benefit and/or harm or threaten water resources and/or environment would pay the highest penalties. The proposed penalty assessment guidelines are designed to serve the following four important purposes:

1. Penalties should be large enough to deter noncompliance.
2. Penalties should help insure that violators do not obtain an economic advantage over their competitors.

3. Penalties should be consistent and predictable across all geographical locations. This is desirable to provide fair and equitable treatment to the regulated community wherever they may operate.
4. Penalties should be based on a logical calculation methodology to promote swift resolution of enforcement actions and the underlying violations.

Penalties for noncompliance with water and environment legislations in SWIM-SM PCs should be incorporated with the regulating ordinances, including standards and Maximum Permissible Levels (MPL) specified in the various requirements either currently in use or under development. Cash penalties should be only one element of regulating authorities overall enforcement effort. Regulating authorities might also consider other sanctions, in addition to the cash penalties such as:

- Denying or revoking permits.
- Partial or full Shutdown of operations.
- Cutting essential services such as water, electricity or telephone lines.
- Imposing additional compliance conditions.
- Incarceration.
- Publicizing enforcement actions to create deterrence.

It is strongly recommended that regulating authorities in SWIM-SM countries take specific enforcement actions at the very early stages, immediately following the issuance of the enacted regulations, against violators at specific sites where inspections have revealed violations. These firm and intractable actions will very likely be capable of fostering compliance at all locations throughout the country. Based on every experience from around the world, enforcement casts a wide shadow of deterrence, which dissuades people from violating any water and/or environment laws.

In principle, a credible enforcement presence by the regulating authorities will presumably give the regulated parties a substantial incentive to comply. Many regulated party managers will indoctrinate that it is good business strategy to comply with the enacted regulations, it is worthy to acquire immaculate reputation and meritorious to take the credit for good community citizenship. The alternative is noncompliance and the unfavorable publicity associated with violations and penalties for them. In order to achieve such a status of compliance the regulating authorities in the SWIM-SM region need to take the following actions:

STEP V-1 Identify your aims for imposing noncompliance penalties

In identifying the rules for assessing penalties for noncompliance with water and environment legislations, the regulating authorities in the SWIM-SM region might choose to consider the realization ofthe following goals:

1. The first goal is the realization of successful deterrence because it provides the best protection for water and environment and it reduces resources necessary for program administration. If penalty is to achieve deterrence, both a potential violator and the general public must be convinced that a penalty places a violator in a worse position than those who have complied in a timely fashion.
2. The second goal of enforcement via appropriate penalty assessment is the fair and equitable treatment of regulated community.

3. The third goal of enforcement by penalty assessment is provision of a swift solution for a lingering water and/or environment problems.

The legislations either enacted or currently under preparation in the region should authorize and enable in their provisions, the administrators of the regulating authorities to bring civil judicial and administrative actions against those who violate certain enumerated requirements of these regulations. In these judicial and administrative actions the administrator of the regulating authority may seek civil penalties.

STEP V-2 Identify criteria to assess sanctions for deterrence

Regulating authorities in the SWIM-SM region should develop an internal policy on items to consider in defining the civil penalty that will provide adequate deterrence. In most cases the items for consideration should be designed to ensure that penalties eliminate any significant economic benefit resulting from noncompliance. In many instances, the economic advantage to be derived from noncompliance is the ability to delay making the expenditures necessary to achieve compliance.

Examples of noncompliance may include one or more of the following:

- Withdrawal of groundwater beyond allocated volumes.
- Tampering with water flow-meters.
- Illegal drilling of water wells and illegal taping to water networks.
- Discharge of wastewater exceeding the maximum allowable concentration.
- Failure to install equipment needed to meet discharge control standards.
- Failure to affect process changes needed to eliminate pollutants from waste effluents.
- Failure to self monitor where testing is mandatory to demonstrate achieved compliance.

A penalty should include an amount reflecting the seriousness or gravity of the violation. Factors and criteria that regulating authorities in the SWIM-SM region might take into consideration in this case include:

- Actual or possible damage caused by the violation.
- Importance to the regulatory scheme.
- Relative impact of a penalty on the violator.
- Amount of wastewater released to the environment.
- Degree of toxicity of the discharged effluent.
- Sensitivity and vulnerability of the receiving water body to the discharge.
- The duration of time a violation continued.
- The degree of willfulness or negligence.
- The degree of cooperation or non-cooperation in reporting of noncompliance and prompt correction of environmental problems.
- History of noncompliance.
- Ability of the violator to pay the fine.

STEP V-3 Establish a methodology for penalty calculation[54]

A statutory maximum penalty should be included in the water and environmental regulations either currently implemented or under preparation by SWIM-SM PCs. For instance, the maximum statutory penalty for illegal boring of water well is US $ 10,000.00; the maximum statutory penalty for failure to properly monitor for a certain pollutant is US $ 2,000.00; etc. Before proceeding to calculate the settlement penalty, regulating authority staff should estimate the statutory maximum penalty in order to determine the potential maximum penalty liability of the violation. The penalty that any regulating authority seeks in settlement may not exceed the specified statutory maximum amount. In the case of discharge of polluting wastewater the maximum penalty for violations exceeding one day includes a separate penalty for each additional day in the time period (assuming there was a discharge on each day). In order to illustrate how to develop a methodology to calculate a penalty for the violation of water and environment regulations, a numerical example of illegal discharges of certain pollutants to a water body will be used. Based on the above discussions, any monetary penalty should be calculated based on the following general formula.

PENALTY = ECONOMIC BENEFIT + GRAVITY +/- GRAVITY ADJUSTMENT FACTORS – ABILITY TO PAY

Economic Benefit:

Every effort should be made to calculate and recover the economic benefit of non-compliance. The main purpose of incorporating economic benefit in calculating the due penalty is to place violators in the same financial position as they would have been if they had complied on time. regulated party that violate certain water and/or environment act are likely to have obtained an economic benefit as a result of delayed or completely avoided control expenditures during the period of noncompliance.

Gravity Component

It is important for regulating authorities in SWIM-SM countries to make every reasonable effort to calculate and recover a gravity component in addition to the economic benefit component. The removal of the economic benefit of noncompliance only places the violator in the same position, as he would have been if compliance had been achieved on time. Both deterrence and fundamental fairness require that the penalty include an additional amount to ensure that violator is economically worse off than if he had obeyed the law. It is important to note that calculation of gravity should be based upon a logical scheme and criteria that quantify the gravity of violation grounded on either the enacted regulations or regulations currently under preparation.

The gravity component of a penalty is usually calculated for a certain period **"T"** (day, week or month) in which there was a violation. In the case of effluent limit violations, the total gravity component for the penalty calculation equals the sum of each gravity component in time **T**. The **T** gravity formula is as follows:

T Gravity Component = (1 + A + B + C + D) x US $ 100

*** US $** 100 is a suggested penalty that can be readjusted by the regulating authority

[54] Environmental Protection Agency, USA, (1995), "Interim clean water act settlement penalty policy"

Factor A: Significance of Violation (Rate of 0 to 20).

This factor is based on the degree of surpasses of the most significant effluent limit violation in each time duration **T**. Values ranging from 0 to 20 are selected from within designated ranges; violations of toxic effluent limits are weighted most heavily (for a duration **T**). The following guideline is proposed for the A factor as follows:

Table 1: GravityFactor A - Significance of Violation

Percent by which effluent limit was exceeded	Factor A Value Ranges	
Maximum %	Toxic Pollutants**	Conventional Pollutants*
1-50	1-3	0-2
51-100	1-4	1-3
101-200	3-7	2-5
201-600	5-15	3-6
601- >	10-20	5-15

*Conventional pollutants are pollutants that are not identified as toxic such as BOD, TOC, Total Dissolved Solids etc. in water.

** Toxic pollutants are mercury, Chromium, PCBs, dioxin, etc.

If there were no effluent limit violations in a particular time duration **T**, but there were other violations, then factor **A** is assigned a value of zero in that duration's gravity calculation.

Factor B: Health and Environmental Harm (range 0 to 50)

A value of this factor is selected for each duration **T** in which one or more violations present an actual or potential harm to human health or to the environment. Values can be selected from the suggested values of **B** in the following table:

Table 2: Gravity factor B - *Health and/or Environmental Harm*

Type of Actual or Potential Harm	Factor B Value Ranges
Impact on human health (e.g. damage to water supplies, water quality degradation, etc.)	10-50
Impact on water and/or environment	
Whole effluent toxicity limits were exceeded	1-10
Fish kill, beach closing, restriction of water body, land deprivation, etc.	4-50
Other impacts on aquatic or earth environment.	2-25

Factor C: Number of Effluent Limit Violations (Range from 0 to 5)

This factor is based on the total number of effluent limit violations within time duration **T**. In order to properly quantify the gravity of the violations; all effluent limit violations are considered and evaluated. Violations of different parameters at the same outfall are counted separately. A minimum factor **C** value of one is generally appropriate whenever there are violations of two or more different pollutants. Values for this factor may be selected by comparing the number of effluent limits exceeded with the number of effluent limits in the permit. For instance if all the limits in the permit

were violated in the time duration **T**, a value of 5 would be appropriate; if 50% of the limits in the permit were violated, a factor of 2 to 3 would be appropriate.

Factor D: Significance of Non-Effluent Limit Violations (From 0 to 70)

This factor is based on the severity and number of non-effluent limitations requirements violated each time duration **T**. The types of non-effluent violations can be 1- violations of monitoring requirements, 2- violations of reporting requirement, 3- pretreatment program implementation, 4- unauthorized discharges, etc. The value of **D** for a given duration **T** is the sum of the highest value for each type of non-effluent limit violation.

As an example for calculating factor D, for certain duration, assume the following:

- The discharger did not sample for 5 of the 10 parameters in its permit,
- The discharger submitted his monitoring report 20 days late
- The discharger discharged a process effluent through an unauthorized outfall without treatment for several days.

From Table 3, the value of factor **D** will be calculated as follows:

- A value of 4 will be selected for failure to conduct half of the parameters from the first type.
- The delay in submitting the report should not be considered, since the other type 1 violation produced a higher value.
- For the unauthorized discharge a value of 6 may be selected for type 4.

Thus the total value for factor D for the specified time duration is **4 + 6 = 10**.

Table 3: Gravity factor **D** - Non-effluent limit violations

The factor value for a given time duration T is the sum of the highest value for each type of non-effluent limit violation	
Type and extent of violations	Factor **D** value range
Type 1- Effluent monitoring & reporting violations	
Failure to conduct or submit adequate pollutant sampling data or 1 or more pollutant parameters (but not all parameters)	1 to 6
Failure to conduct or submit any required pollutant sampling data in a given time duration T but with reasonable belief that the facility was in compliance with applicable limits	2 to 6
Failure to conduct or submit any required pollutant sampling data in a given time duration T but without reasonable belief that the facility was in compliance with applicable limits	6 to 10
Failure to conduct or submit whole effluent toxicity sampling data	4 to 10
Delay in submitting sampling data	0 to 6
Failure to submit a periodic compliance report or to sample again after finding violations	2 to 8
Any other monitoring or reporting violation	0 to 10
Type 2- Pretreatment program implementation violations	
All key program activities implemented, with some minor violations	0 to 4
Many key program activities not implemented	4 to 8

Few if any program activities implemented	6 to 10
Type 3- Unauthorized discharge: e.g. discharge through an un-permitted outfall, discharge of a pollutant not identified in the permit, etc.	1 to 20
Type 4- Any other type of non-effluent limit violation	1 to 12

Gravity Adjustment Factors:

In certain circumstances, the total gravity amount may be adjusted by two additional factors, namely the history of recalcitration (to increase gravity), and quick settlement reduction factor (to reduce gravity). The resulting figure [Benefit + (gravity +/- gravity adjustments)] is the preliminary penalty amount.

History of Recalcitration:

The recalcitrance adjustment factor is used to augment the penalty based on a violator's bad faith, or unjustified delay in preventing, mitigating, or remedying the violation. This factor is applied by multiplying the total gravity component by a percentage between 0 to 150 percent. A minimum recalcitrance factor of 10 percent is generally appropriate for each instance in which a violator fails to substantially comply, in a timely manner with an administrative compliance order, information request, or a sate enforcement order. Thus if a violator violated 3 administrative orders, a minimum recalcitrance factor of 30 percent is generally appropriate.

Quick Settlement Adjustment Factor:

In order to provide an extra incentive for violators to negotiate quickly and reasonably, and in recognition of a violator's cooperativeness, the regulating authorities may reduce the gravity amount by 10 percent if the regulating agency expects the violator to cooperate.

Ability To Pay:

Regulating agencies should not request settlement penalties that are clearly beyond the financial capability of the violator. This means that the regulating agency should not seek a penalty that would seriously jeopardize the violator's ability to continue operations and achieve compliance, unless the violator's behavior has been exceptionally liable, recalcitrant, threatening to human health or the environment, or the violator refuses to comply. The adjustment for ability to pay may be used to reduce the settlement penalty to the highest amount that the violator can reasonably pay and still comply with the issued acts. The violator has the primary responsibility of establishing the claim of inability to pay. If the violator demonstrates an inability to pay the entire penalty in one lump sum in 30 days, a payment schedule should be considered. The period allowed for such installment payments should not generally extend beyond three years.

Annex I: Check-listto assess the available enforcement capacity and mechanisms currently practiced in SWIM-SM region to enforce water legislations

The present checklist is meant to guide national Non-Key-Experts (NKE) on the information to be collected from national regulating authorities to portray the current level of compliance and adequacy of technical, institutional and legislative capabilities to enforce water and environment legislations in the selected SWIM-SM PCs.

The check-list shall be completed in 6 copies only by the national NKE in an interview with the following 6 national officials.

1. **Regulating administration in Ministry of Water Resources & Irrigation.**
2. **Central Monitoring Laboratories at the Ministry of Water Resources & Irrigation.**
3. **Regulators of Central Water & Wastewater Authorities, or Holding Companies, or Administrations or Ministries, or Municipalities as appropriate in each country.**
4. **Director of Environmental Monitoring Department at the Ministry of Environment.**
5. **Director of Central Water Laboratory at the Ministry of Public Health.**
6. **The SWIM-SM National Focal Points.**

In addition to the completion of the questions, national NKEs are asked to collect references to water legislation as well as ask for qualitative statements in case considered useful for the assessment. In addition, it would also be useful to ask for published reports and updated literature, in case considered useful for the assessment.

I- APPROACHES FOR COMPLIANCE & ENFORCEMENT WITH WATER AND ENVIRONMENT LEGISLATIONS IN SWIM COUNTRIES:

There are many approaches to ensure compliance with water and environment legislations. The need for and scope of enforcement policies partially count upon which management approach or combination of approaches is currently being used.

1.1. VOLUNTARY APPROACH

This approach encourages or assists in complying with water & environment legislations, but does not require it. It heavily relies upon public education, awareness, technical assistance, and the promotion of environmental leadership by NGOs.

1. **Is this approach applicable in the water & environmental legislations?**

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

2. **Is the level of awareness among water users and the public at large is adequate to accommodate this approach?**

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

3. **Is the inspection and monitoring infrastructure adequate enough to follow-up on the**

voluntary approach if applied?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

I-1- COMMAND & CONTROL APPROACH:

In the command and control approach, the water & environment regulating prescribes the desired changes through detailed requirements, promotes compliance with these requirements and finally enforces compliance with these requirements.

1. Is command and control approach the preferred approach in complying with water & environment legislations?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

2. Did the government created and promulgated a well-designed series of feasible water & environment laws and acts (commands) to apply the command and control approach?

Yes **100% sure** **<75% sure** **<50% sure** **<25% sure** **No**

3. Were different sectors of the government involved in the process of preparing water & environment legislations and regulations to secure maximum participation and transparency?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

4. Are the current water & environment laws and regulations suffering from fragmentation? If yes, could you specify the fragmentation (e.g. in terms of clear allocation of responsibilities, enforcement capabilities in terms of non-compliance, technical specifications, etc.)?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

5. Are the responsibilities, roles and specific tasks for the implementation, enforcement, inspection and control of compliance sufficiently and clearly addressed in water legislation?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

6. Are the water and environment legislations enforceable, i.e. that laws provide the necessary authorities and mandates for enforcement?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

7. Do the water & environment requirements rely on affordable, reliable, and/or available technologies?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

8. Do the water & environment legislations accurately define what resources or activities are subject to the requirements?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

9. Are all water"sources" (including surface waters, groundwater, transitional, coastal and marine waters) sufficiently and clearly addressed in water legislation?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

10. Are there particular provisions for waters used as bathing and/or drinking water?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

11. Do the water legislation include environmental objectives (in terms of biology, chemistry, morphology, quantity, as applicable) for water sources with clear deadlines to comply with these provisions?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

12. Are all relevant sectors addressed by water legislation (e.g. agriculture, industries, households)?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

13. Are the measures to be implemented by the relevant sectors in order to meet the required environmental objectives sufficiently and clearly addressed in water legislation?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

14. Do the water & environment legislations precisely define the requirements and the conditions for any exceptions or deviation from these requirements?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

15. Are the water & environment legislations drafted clear enough to be the basis for the prosecution of noncompliance?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

16. Are the fines and penalties for non-compliance with the provisions sufficiently and clearly addressed in water legislation (e.g. administrative actions, civil and/or criminal judicial actions)?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

17. Do you believe that water & environment regulations clear, precise, unambiguous, not overlapping, not contradictory and easy to comply with? Are the legal requirements sufficiently clear to be applicable and operational on a technical level or are there problems to understand the"legal" language?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

18. Do the water & environment regulations clearly define how monitoring for compliance is proofed by specifying measuring techniques, testing methods and procedures? Do the monitoring systems include clear provisions for technical specifications and standardized methods for analysis and monitoring of the water status (e.g. frequency, selection of monitoring points, selection of quality elements, international ISO standards, QA/QC procedures, etc.)?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

19. Do the water & environment legislations clearly state deadlines for compliance?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

20. Are the water & environment legislations flexible enough to be constructively adapted through individual permits and/or licenses without jeopardizing their credibility?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

21. Are the water & environment legislations based on control and monitoring technologies that are available, affordable and reliable?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

22. Do you think that your government needs to invest in additional efforts to sensitize and integrate water & environment regulations to avoid translocation of water pollutants from one media to another?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

23. Did the government allocate adequate resources to promote water & environmental compliance with the requirements?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

24. Did the government establish appropriate inspection and monitoring capacities (control systems) needed to ensure compliance and enforcement of the water & environment legislations?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

25. Is the government supplementing the command and control approach with other approaches such as market-based economic incentive approaches, participatory approaches, etc.?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

26. Did the relevant authorities issue relevant regulations, by-laws and guidance to implement the promulgated water & environment laws?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

27. Did the relevant authorities issue relevant regulations and guidance to inspect water & environment facilities and gain access to their records, data and equipment to determine if they are in compliance?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

28. Did the relevant authorities issue requirements for water & environment sectors to monitor their own compliance, keep records of their conformity and systematically report to enforcement programs?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

29. Did the relevant authorities issue relevant regulations and guidance to take legal action against non-complying water & environment facilities?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

30. Did the relevant authorities issue relevant regulations and guidance to immediately correct situations that pose an imminent and substantial threat to water resources, public health and/or the environment?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

31. Did water & environment authorities issue ambient standards specifying the maximum allowable levels of pollutants in the receiving water medium?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

32. Did water & environment authorities developed their own national ambient standards or adopted them from other places?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

33. Was the selection process of primary ambient water quality standards participatory in nature involving relevant sectors and stakeholders?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

34. During the selection process of primary ambient water quality standards, were issues such as the techno-economic feasibility and societal costs given enough consideration?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

35. Are the national monitoring systems including testing laboratories adequate for the characterization of pollutants discharged to the water bodies and their potential transformation in the aquatic environment?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

36. Are there adequate capacities to assess total pollution loads released from various point and non-point (fugitive) sources to water resources bodies?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

I-2- MARKET BASED/ECONOMIC INCENTIVE APPROACH:

Market based/economic incentive approaches use market forces to achieve better compliance with water & environment legislations. Introducing market forces including polluter pay principle, incentives and disincentives into a command and control approach can encourage greater compliance with water & environment requirements.

1. Is the government imposing a fee system such as effluents, and other environmental releases to water bodies?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

2. Is the government promoting water tariffs (recovery of costs) for water services including progressing tariff on water consumption to promote prudent use of water ("making water prices right")?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

3. Is government offering economic incentives on water savings and/or conservation?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

4. Is government providing economic incentives for water quality protection efforts?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

I-3- RISK-BASED APPROACH:

The risk-based approach establishes priorities for compliance and enforcement based on the potential for reducing the risks posed to public health, water resources and/or the environment.

1. Does the government established adequate water & environment monitoring programs that systematically measure the water consumption and wastewater discharges to the fresh water bodies?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

2. Does the government established reliable database and information systems capable of storing, retrieving and disseminating water & environment data to assess risks and follow-up noncompliance?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

3. Is the national expertise in the area of water resources management, bio-statistics, environmental epidemiology, environmental health and ecological risk assessment adequate to assess damage due to noncompliance?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

4. Are the water & environment data available for assessing damage attributed to noncompliance of acceptable quality and reliable?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

5. Are the background-level data on the original state of the water resources and ambient environment limited and obstructing the risk and damage assessment resulting from noncompliance with water & environment regulations?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

II- FACTORS AFFECTING COMPLIANCE & ENFORCEMENT OF WATER & ENVIRONMENT LEGISLATIONS:

II-1- DETERRENCE:

The phenomenon of people changing their normal behavior to avoid a sanction is called deterrence.

1. Do you think, under the current circumstances, water and environmental violations are likely to be detected?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

2. Do you think official response of the government to violations is swift and predictable?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

3. Does the response usually include a proportionate sanction?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

II-2- ECONOMICS FACTORS:

The regulated community will be more likely to comply in case (1) where enforcement officials can demonstrate that compliance will save money, or (2) when the government provides some form of subsidy for compliance.

1. Are enforcement officials capable of demonstrating that compliance with water & environment regulations will save money?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

2. Does the government provide some form of subsidy for compliance?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

3. Is there an approved methodology for penalty calculation of noncompliance?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

II-3 INSTITUTIONAL CAPACITY AND CREDIBILITY

In most of SWIM countries, legislations, and some form of institutions and regulating bodies were established to ensure compliance with water and environment regulations.

1. Are the enacted water and environment laws, legislations, regulations, etc. adequate to ensure compliance?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

2. Are the enacted environmental legislations unenforceable due to defects in their design?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

3. Are the institutions responsible for enforcement lacking the political power?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

4. Are the implementing institutions provided with adequate human and financial resources for the enforcement of water & environment legislations? Is there regular institutional building in place for respective experts (further education and training)?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

5. Are all national projects subject to EIA?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

6. Are some government economic sectors unofficially exempt from complying with water & environment regulation to presumably promote economic development and reduce unemployment?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

7. Are some political forces and/or favors influencing compliance with water & environment regulations?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

8. Is corruption one of the elements contributing to no compliance with water & environment legislations?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

II-3 SOCIAL FACTORS:

The role of governments is to bring a majority of the regulated community into a social norm and a culture of compliance with water & environment regulations. However, personal and social relationships play a pronounced role in the implementation of environmental legislation.

1. Are regulated parties complying with water & environment legislations out of their genuine desire to conserve water and improve the environmental quality?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

2. Do regulated parties and corporate managers fear loss of prestige that can result if information about noncompliance with water & environment regulations is made public?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

3. Are friendly relationships between enforcement program supervisors and managers of the regulated facilities affecting the level of compliance with water & environment legislations?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

II-4 PSYCHOLOGICAL FACTORS:

Compliance with water & environment legislations necessitates some changes in operation and management. A major common factor in human nature is the fear of changes. Also closely related to this is inertia. Many people particularly in the public sectors and/or public utilities tend to naturally resist changes because of the perceived effort it will require to enact the change.

1. Is fear of changes affecting the level of compliance with water & environment legislations?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

2. Does inertia represent a real challenge to achieve compliance with water & environment legislation?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

3. Did financial incentives been considered to compensate for the extra efforts needed to comply with water & environment legislations?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

4. Did serious punishment for noncompliance been a major factor for promoting compliance with water & environment legislations?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

5. Is the feeling of patriotism among regulated parties contributing to higher compliance with water & environment legislations?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

II-5- KNOWLEDGE & TECHNICAL FEASIBILITY:

In many cases, the regulated parties do not understand what steps they have to take to achieve compliance with water and environment legislations. Furthermore, they do not often have access to the necessary technology to comply.

1. Does lack of knowledge and technology is representing a barrier to compliance with water and environment legislations?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

2. Are the water and environment enforcement authorities providing education, outreach and technical assistance to the regulated parties to enable them comply with water & environment legislations?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

III- MONITORING OF ENVIRONMENTAL COMPLIANCE IN SWIM-MS COUNTRIES

Monitoring compliance is the most important element of any compliance and/or enforcement program. Monitoring compliance by collecting and analyzing information on the compliance status of the regulated groups is fundamental to:

4. Detect and correct noncompliance
5. Assess the enforcement program progress
6. Provide credible evidence to support enforcement actions

1. Did the government or regulating authorities design a national compliance strategy that is based on the establishment of a compliance monitoringprogram, which sets out the priorities and rationale for conducting on-site inspections and other types of compliance monitoring?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

2. Are the water and/or environment inspection units affiliated with the permitting department having strong links with monitoring and pollution control divisions?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

3. Are water & environment regulating authorities conducting inspections on whether the water relevant sectors have an up-to-date permit or license?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

4. Are water & environment regulating authorities inspecting on whether the water relevant sector installed pollution control equipments?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

5. Are water & environment regulating authorities inspecting on whether the water pollution equipments installed by water relevant sector are operational?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

6. Are water & environment regulating authorities inspecting on whether the water relevant sector is withdrawing and consuming water resources according to the permissible levels?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

7. Are water & environment regulating authorities inspecting on whether the practices of the water relevant sector support the required compliance activities?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

8. Are water & environment regulating authorities inspecting on signs of intentional violations and/or falsification of data?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

9. Are the Government inspectors authorized to examine books, records or electronic data and make copies of them and check on the compliance history of facilities?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

10. Do the government regulating authorities established time scheduled program of inspections and investigations that are complemented by spot checks?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

11. Are regular follow-up procedures in place in case of non-compliance (more regular inspections and investigations, fines, penalties)?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

III-1- TYPES & LEVELS OF INSPECTION:

i. Walk-through Inspection: Are the water & environment regulating bodies authorizing skilled and experienced inspector to note the existence of water meters, existence and operation of water pollution-control facilities, checking water & environment performance records, etc.?

ii. Compliance Evaluation Inspection: review and evaluate water & environment records, interview personnel, determine the details about pollution control systems and devices in place and possible collection of a grab sample of the effluent for quick analytical checks?

iii. Sampling Inspection: Are the water & environment regulating bodies authorizing skilled and experienced inspector to undertake preplanned sample collection to document discharge of pollutants to water bodies?

1. Are the regulating authorities providing training for water & environment inspectors?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

2. Are the regulating authorities developing infrastructure including administrative and criminal prosecuting authorities (police, public prosecutor, municipalities, central government, etc.)?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

3. Are the regulating authorities providing the logistics and support equipment - e.g. vehicles or alternative transportation facilities, field sampling equipment, instruments and gears for rapid field monitoring and assessment?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

4. Did the regulating authorities identified and established certified measuring systems and accredited laboratories for reliable and comprehensive testing? Do the monitoring systems include clear provisions for technical specifications and standardized methods for analysis and monitoring of the water status (e.g. frequency, selection of monitoring points, selection of quality elements, international ISO standards, QA/QC procedures, etc.)?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

5. Did the regulating authorities established a functional administrative system to document, follow-up and keep records of inspections?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

6. Is the regulating authorities providing documentation equipments such as video cameras, film, hard disks, flash-memories, logbook, and tape recorder to record information and evidences?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

7. Are the regulating authorities providing safety equipment and security police forces to protect the inspectors from hazards that may be encountered during inspections?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

8. Are the regulating authorities allowing for self-monitoring, record-keeping, and reporting?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

III-2- ANALYSIS OF PHYSICAL SAMPLES OF EFFLUENTS AND QUALITY OF RECEIVING WATER BODIES:

1. Are the regulating authorities hiring specialized skilled personnel to conduct direct sampling and analytical measurements of water including drinking water and wastewater?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

2. Did the regulating authorities establish certified or accredited testing laboratories to physically analyze samples of water including drinking water and wastewater effluent according to recognized standard procedures?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

III-3- AREA MONITORING:

Area monitoring consists of using ambient monitoring or remote sensing to monitor water & environment conditions in the vicinity of a facility or over a large area using ambient monitoring, remote sensing and over-flights.

1. Is ambient monitoring, remote sensing & over-flights are used as techniques to monitor compliance with water & environment regulations?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

2. Is ambient monitoring used to study sediment deposition, reservoir morphology, water quality, tracing water pollutants, etc.?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

III-4- CITIZEN COMPLAINTS:

The public complaint process is one of the most common mechanisms for public input in water & environmental enforcement. Citizen complaints can be used to unveil and expose non-compliance's that are not detected by inspection or self-monitoring.

1. Do you consider the information of the public (citizens/water consumers) sufficient to promote compliance with water legislation?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

2. Are there any processes established to consult and/or promote public participation in water management implementation?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

3. Do the water and environment regulating authorities allow for public complaints to expose non-compliance with legislations?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

4. Did the regulating authorities establish and publicize telephone hotlines to report obvious non-compliance and violations of water & environment legislations?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

5. Is there a follow-up procedure for citizen complaints (feedback, official letters) in place?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

IV- CREDIBLE EVIDENCES FOR THE INDICTMENT OF VIOLATORS OF WATER &ENVIRONMENT LEGISLATIONS

Compliance and Enforcement of water & environment requirements will evidently necessitate the submission of unchallenged indictment evidences of violations and noncompliance to the court of law if deemed necessary. Most of the evidences of indictment will be based on results generated from monitoring systems either in the form of in-situ automated systems or analytical laboratory systems designed for the analysis of water & environment samples from different matrices.

1. Mark on the evidence that the water & environment regulating bodies consider as unchallenged evidence of noncompliance with regulations in the following table:

Evidence	Yes	No
Inspection reports.		
Recorded personal observations during inspection		
Video recording of the offences		
Dated photographs with clear landmarks		
Examination of self-monitoring reports		
Field notes appropriately dated and signed or initiated		
Specific conversation with identified individuals		
The collection of samples at a particular time in a particular day, and similar information		

IV-1- SAMPLING AND ANALYSIS:

Traditionally, prosecutors and judges are very fond of analysis and measurements. These are considered as “hard facts or evidences”.

1. In furnishing credible evidences for noncompliance with water & environment regulations, are the monitoring and measuring systems giving adequate consideration to the following criteria:

Criteria	YES	NO
Precision, accuracy and reproducibility of the analytical methods.		
Sensitivity and detection limit of the analytical methods.		
Reliability including routine maintenance and operation of sampling gears, measuring instruments, etc.		
Adopted Quality Assurance (QA) and Quality Control (QC)		

programs.

Chain of custody

Qualifications, training and competence of inspectors, field and laboratory operators.

Proper documentation of sampling and analyses procedures are recorded, dated, and signed or initiated by the person who is in a position to testify regarding the presented facts.

IV-2- IMPLEMENTATION OF A FLAWLESS CHAIN OF CUSTODY:

In order to make environmental analysis admissible to court of law and utilized in the legal proceedings, they should be subject to a very tight chain of custody. Proper chain of custody procedures allow the possession and handling of environmental samples (evidences) to be traced and identified at any moment, from the time that sample containers are initially prepared for sampling, to the final disposition of the sample.

1. Are the water & environment regulating bodies requesting the adoption of chain of custody to ensure integrity of reported information?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

IV-3- REPORTING AND DOCUMENTATION:

10. Is there a regular and transparent exchange of environmental information established and foreseen in water legislation (e.g. data on water quality published on web-pages?)?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

11. Is there a national water information system in place? To be used as information tool for citizens to be informed about the status of"their"waters and for compliance checking? If yes, is there open access to actual and reliable data?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

12. Are the water & environment regulating bodies requesting details about water sample submitted for analysis such as:

Documents	YES	NO
Sample collection date; time; locations; etc.		
Hydrographic circulation patterns or flow		
Methods of collection; and collector		
Method of transportation		
Means of storage		
Methods of analysis (standard method?)		
Methods of calibrations, quality assurance, quality		

control, etc.

Chain-of-custody and security

Elapsed time from sample collection

Test results including quality control results such as field and laboratory blanks, duplicates, replicates, spikes and controls

All calculations that impact test results and interpretation such as instrument calibrations, detection limits, method's sensitivity and standards preparation.

Inter and intra laboratory calibrations of measurements.

V-4- EXPERT AND WITNESS TESTIMONY:

Expert testimony is evidence presented by a person where both sides and the court agree that the person is an expert on the subject at issue because of education, qualification, training, or knowledge of the subject matter.

1. Do water & environment regulating bodies accept an expert testimony on alleged facts presented in a noncompliance case?

Yes 100% sure **<75% sure** **<50% sure** **<25% sure** **No**

V- OVERALL ASSESSMENT:

In your professional opinion:

1. **What is the level of compliance with water legislation?**

100% compliance **<75%** **<50%** **<25%** **No compliance**

2. **What is the level of compliance with environment legislation?**

100% compliance **<75%** **<50%** **<25%** **No compliance**

3. **What are the main challenges and constraints towards improved compliance with water & environment legislations?**

Challenges/constraints	YES	NO
• **Inadequate legislations**		
• **Lack of public participation in drafting water & environment legislations**		
• **Fragmentation, overlap and duplication of legislations**		
• **Lack of awareness on water & environment requirements**		
• **Economic affordability to comply with**		

water & environment regulations

- **Lack of economic incentives and dis-incentives to promote compliance**
- **Lack of horizontal coordination among enforcement authorities**
- **Inadequate reporting systems and absence of chain of custody in water & environment monitoring**
- **Inadequate technical capacities for monitoring, and inspection.**
- **Inadequate or absence of accredited monitoring and inspection systems.**
- **Inadequate technical capacity of environment & water prosecutors.**
- **Weak judiciary systems including judges on water & environment noncompliance.**

4. **What form of capacity building and/or reform is needed to improve compliance with water and environment legislations?**

- **Enforcement capacity building**
- **Institutional reforms**
- **Technical capacity building**
- **Legislative reforms**
- **Establishment of accredited monitoring & reporting**
- **Establishment of inspectorates**
- **Develop capacity of water & environment prosecutors and/or judiciary systems.**

Annex II:Overall Assessment of the Available Water Legislations Enforcement Capacity and Mechanisms in Egypt

1) Background

Egypt met the 2005 Integrated Water Resources Management (IWRM) specified target by preparing a very comprehensive National Water Resources Plan (NWRP) through a multi-stakeholder and participatory approach under the lead of the Ministry of Water Resources & Irrigation (MWRI, 2007).

Formerly called the Ministry of Irrigation and the Ministry of Public Works and Water Resources, MWRI is responsible for national water resources and is the only body to authorize use of water from the Nile, canals, drains, and groundwater sources. The ministry also has control over works built to discharge water into canals, drains, and the Nile. MWRI is authorized to assess penalties if its orders are not obeyed (AbuZeid and Elrawady, 2009).

While the main Objective of NWRP was safeguarding Egypt's future water needs, the following water and environment related objectives were set along with many other socio-economic objectives:

- Protecting the Nile & water resources from pollution
- Promotion of integrated pest control and limitation on the use of agro-chemicals
- Extension of sewage networks and wastewater treatment plants
- Promotion of water conservation in domestic, agriculture and industry uses
- Supply drinking water and provision of sanitation services according to standards and targets on a cost recovery basis while ensuring the right to basic requirements to all people
- Supply of water for industrial purposes and provision of sewage treatment facilities on a cost recovery basis
- Supply of water for irrigation based on a participatory approach and cost recovery of Operation and Maintenance
- Protection of the water system from pollution, based on a polluter-pays principle and the restoration of water systems, particularly in the ecologically important areas

2) Selected Laws and Decrees

The integration between different ministries has been well assured and reflected in various national decrees and laws. It dates back to 1966 when a presidential decree (2703, 1966) stating that the Ministry of Health must form a high water committee was issued. It aimed at enhancing the role of the Ministry of Health in checking all health issues related to water. The committee included members from the Ministry of Agriculture, the Ministry of Irrigation, and the Armed forces. The decree has assigned many tasks to the new committee, including setting standards for raw water treatment and delivery.

Law 48 for the year 1982 has defined all water resources that can be utilized for drinking purposes. It was preceded by Law 27 for the year 1978. Article 2 of that law has granted sole authority to the Ministry of Housing for granting permits to individuals/ entities wishing to use a particular water

source for the purpose of delivering drinking water for human use. Article 6 of the same law has incorporated the role of the Ministry of health in deciding whether particular canal intakes are appropriate for the purpose of delivering drinking water.

In 1980, the Minister of Housing issued an important decree concerning ground and elevated water reservoirs. Decree 111 has specified certain requirements in such reservoirs including being covered so as to prevent the entrance of insects and having openings for cleaning and excess release. The decree also stated that considerations must be made to avoid the seepage of groundwater and drainage water to ground reservoirs. The decree also included a more specific description of "public water resources" which is totally isolated from sources of pollution.

On the governorate scale, governors have always contributed positively to the water sector by issuing relevant decrees. Egypt has seen a significant increase in urbanization in the seventies that was accompanied with a huge preference towards vertical expansion, which introduced a new problem; in many buildings water did not reach higher levels of buildings. The governor of Cairo issued decree 897 for the year 1972 that stated that all individuals or entities seeking building permits for buildings 14 meters or higher than the street level must install water pumps and elevated reservoirs to assure the delivery of water to the higher building level. The Governor of Alexandria issued a similar decree in 1979.

The Governor of Cairo issued decree 26 for the year 1978; the decree included a comprehensive list of water users' categories with an appropriate tariff system for each category. That decree was in line with the decree issued by the Minister of rural affairs in 1961 with many additions. It is worth mentioning that the 1961 decree has put a huge responsibility on property owners to install appropriate water connections.

A new law for water supply and wastewater has been drafted in September 2009, it also incorporate the roles of all previously listed ministries and entities, in addition to the Ministry of Economic Development, the Ministry of International Cooperation, and the Ministry of local Development.

3) Identification of National entities in charge of management, control and enforcement of water and environment legislations

The NWRP is actually implemented by a national executive committee that comprises five other ministries beside MWRI; three of them were identified as important key players with respect to promoting and enforcing compliance to water and Environmental Legislations. The names of these ministries and a brief description of their roles, as specified by NWRP are presented hereby:

The Ministry of Housing:

- Increasing the amount of treated wastewater.
- Decreasing losses in water supply networks.
- Cost recovery of water supply services.
- Spreading public awareness about water preservation.

The Ministry of environmental affairs:

- Spreading public awareness about water preservation. .

- Spreading public awareness about water quality preservation.
- Observing and reporting industrial pollution.

The Ministry of Health:

- Protectinggroundwaterfrompollution.
- Allowing a higher degree of salinity in irrigation water.
- Setting waterqualitycriteria.
- Continuingfamilyplanningcampaigns.

Senior officials on the managerial level from the Monitoring Departments of the four Ministries have been interviewed; the analysis of those interviews will follow. The SWIM Project focal point was also the representative of MWRI.

4) Approaches for Compliance and Enforcement

4.1 The Voluntary Approach

As this approach heavily relies upon public education, awareness, technical assistance, and the promotion of environmental leadership by NGOs, most interviewees has agreed that this approach is not applied in Egypt, the pubic lacks the appropriate education to follow this approach, and also the general culture of complying with laws voluntarily. Moreover, the available monitoring and inspection infrastructure available is currently not sufficient for this approach.

4.2 The Command & Control Approach

All interviewees related more to this approach than the previous ones, and selected it as the preferred approach in Egypt. However, they all agreed that the enforcement component which is part and parcel of this approach is very weak and needs serious enhancements.

The government created and promulgated a well-designed series of feasible water and environment laws and acts (commands) to apply this approach, and according to 3 out of 4 interviewees, there was a high level of participation from different sectors and stakeholders. One interviewee has stated that there are even more laws than needed, which creates more difficulties in enforcement.

The current water & environment laws and regulations are clearly suffering from fragmentation in terms of clear allocation of responsibilities, enforcement capabilities in terms of non-compliance, technical specifications, and connectivity to reality. The current code for wastewater reuse has been identified as an example on how the laws do not accommodate future needs by providing some flexibility to allow for an expanded use of treated wastewater in agriculture.

The question of whether the responsibilities, roles and specific tasks for the implementation, enforcement, inspection and control of compliance are sufficiently and clearly addressed in water legislation, have been answered differently by the interviewees. While, the Representative of MWRI sees that even the farmer is fully aware of his/her responsibilities, the representatives of the Ministry of Health and the Ministry of Housing indicated some ambiguity. While, the representative of the Ministry of Environment was on his MWRI counterpart side, he still indicated that Law 93 of Drainage in particular needs more elaboration on allocation of responsibilities. Most of the interviewees, however, think that the current laws are enforceable and rely on rely on affordable,

reliable, and/or available technologies. MWRI, however, have officially requested the update of laws 12 and 48 to accommodate more modern approaches and technologies. The Ministry of Housing representative thinks that the technology needed for compliance is too expensive to an extent that he may sometimes sympathize with the polluter who cannot afford the technology.

The water & environment legislations accurately define what resources or activities are subject to the requirements, however, not all water "sources" are adequately addressed in legislations. There is apparently not much discrimination between drinking and bathing water as they are both "municipal" water. The water legislations in most part have environmental objectives, except for the health related legislations that need more elaboration on objectives.

Although, all sectors are represented in legislations, the measures to be implemented by the relevant sectors in order to meet the required environmental objectives are neither sufficiently nor clearly addressed in water legislation. Moreover, the water & environment legislations do not precisely define the requirements and the conditions for any exceptions or deviation from these requirements.

The water & environment legislations drafted clear enough to be the basis for the prosecution of noncompliance. The fines, however, are neither sufficiently nor clearly addressed.

The water & environment regulations clearly define how monitoring for compliance is proofed by specifying measuring techniques, testing methods and procedures, but, they don't always include clear provisions for technical specifications and standardized methods for analysis. Deadlines for compliance are stated in some legislation, where a grace period of 60 days is granted, while in other legislations, no clear deadlines are specified, but the laws state that operation licenses are not renewed until compliance is achieved.

The water & environment legislations are totally not flexible so as to be constructively adapted through individual permits and/or licenses without jeopardizing their credibility. In the case of MWRI, only the minister has the authority to grant individual permits.

Although, the legislations are based on control and monitoring technologies that are available, affordable and reliable, still the government needs to invest on more needed technologies. Also, more efforts are needed to sensitize and integrate water & environment regulations to avoid translocation of water pollutants from one media to another. The government did not allocate adequate resources to promote water & environmental compliance with the requirements due to the high cost of media, especially TV.

The government has established relatively appropriate inspection and monitoring capacities to support the command and control approach which is currently not supplemented by other approaches. For the most part, relevant regulations were issued by relevant authorities to implement laws and to inspect water & environment facilities and gain access to their records, data and equipment to determine if they are in compliance. The same relevant authorities also issued requirements for water & environment sectors to monitor their own compliance, keep records of their conformity and systematically report to enforcement program, relevant regulations and guidance to take legal action against non-complying water & environment facilities, and ambient standards specifying the maximum allowable levels of pollutants in the receiving water medium. Regulations and guidance to immediately correct situations that pose an imminent and substantial

threat to water resources, public health and/or the environment were also issued but on a smaller scale compared to all the previous.

About half the laws and regulations were adopted from international models, and the other half was developed based on a participatory approach involving all sectors and stakeholders, however, issues such as the techno-economic feasibility and societal costs were not given enough consideration.

Generally, the national monitoring systems include testing laboratories adequate for the characterization of pollutants discharged to the water bodies and their potential transformation in the aquatic environment except in the Ministry of Health where more tests for more pollutants need to be available. There are moderately adequate capacities to assess total pollution loads released from various point and non-point (fugitive) sources to water resources bodies. While, the laboratory at MWRI has the ISO recognition, its counterpart at the Ministry of Health doesn't have the capability of performing tests that the officials deem important, because they are related to pollutants not yet mentioned in the laws and regulations , that apparently need to be updated.

4.3 Market Based/ Economic Incentive Approach

This approach uses market forces to achieve better compliance with water & environment legislations. The government imposes a fee system that is regarded by some as a weak system that nobody fears. On the other hand, the government is not promoting any enhancement to the current water tariff system that is currently not equally enforced on all sectors, must users pay a monthly lump sum rather than a meter based tariff. The industrial sector is more precisely charged for water. Irrigation water is totally free with some cost recovery schemes proposed. Water pricing in general is an alien issue to Egyptian culture. The government does not award or offer any incentives for water saving or compliance with regulations. The Ministry of Environment just offers tax deductions on imported equipment related to an environment/ water saving project.

4.4 Risk Based Approach

The risk-based approach establishes priorities for compliance and enforcement based on the potential for reducing the risks posed to public health, water resources and/or the environment. There are programs established by the relevant authorities to measure water consumptions and wastewater discharges, accompanied by a moderately effective database managed by experienced personnel. The background-level data on the original state of the water resources and ambient environment is not totally limited and does not obstruct the risk and damage assessment resulting from noncompliance with water & environment.

5) Factors Affecting Compliance and Enforcement of Water& Environment Legislations:

5.1 Deterrence

The phenomenon of people changing their normal behavior to avoid a sanction is called deterrence.

Under the current circumstances, water and environmental violations are not likely to be detected. However, when violations are detected, the response is usually swift and includes a suitable sanction.

5.2 Economic Factors

The regulated community will be more likely to comply in case (1) where enforcement officials can demonstrate that compliance will save money, or (2) when the government provides some form of subsidy for compliance. Currently, in Egypt, enforcement officials are not very capable of demonstrating that compliance with water & environment regulations will save money. On the other hand, the government does not offer any subsidy for compliance. There is an approved and clear methodology for penalty calculation of noncompliance.

5.3 Institutional Capacity and Credibility

The enacted water and environment laws, legislations, and regulations are both enforceable and adequate to assure compliance, although the relevant institutions that are responsible for enforcement lack the political power. Otherwise, adequate human resources for the enforcement of water & environment legislations are available, the financial resources for the same purpose need more enhancement. All National projects are subject to Environmental Impact Assessment (EIA) , Governmental entities are by no means exempted from compliance with laws, and political favors have no influence on such compliance. Little, untraceable corruption may have some influence on compliance.

5.4 Social Factors

It is safe to say that compliance in Egypt is not out of the genuine desire to conserve water and the environment. Some commercial and industrial entities fear the loss of prestige if it is publically known that they do not comply with water and Environment regulations. Friendly relations between regulated parties representatives and inspectors may have a slight influence on compliance.

5.5 Psychological Factors

The theory stating that fear of changes affect compliance does not seem very applicable in Egypt. While financial Incentives have not been seriously considered as a measure to improve compliance, serious punishment for violators has been a major factor for promoting compliance. The feeling of patriotism among regulated parties is not strongly contributing to higher compliance with water & environment legislations.

5.6 Knowledge and Technical Feasibility

Lack of knowledge and technology is not the main barrier to compliance with water and environment legislations; although, the water and environment enforcement authorities are not providing much education, outreach and technical assistance to the regulated parties to enable them comply with water & environment legislations.

6) Monitoring of Environmental Compliance in Egypt

There is a high level of environmental monitoring programs in Egypt, but it doesn't reach the level of a "National Integrated Strategy". On semi-regular basis, the regulating authorities in each Ministry checks on licenses, pollution control equipment and the status of their functionality, water withdrawals by different water sectors, and signs of intentional violations. In most cases,

government inspectors are authorized to examine books, records or electronic data and make copies of them and check on the compliance history of facilities.

6.1 TypesandlevelsofInspection The authorities are paying moderate attention to staff training infrastructure. In some ministries the logistical support to inspectors is more of a problem than others. Almost all the regulating authorities have identified and established certified measuring systems and accredited laboratories for reliable and comprehensive testing, the monitoring systems include clear provisions for technical specifications and standardized methods for analysis and monitoring of the water status, and these systems are usually supported by well-organized documentation systems and aided by advanced documentation equipment such as video cameras. With the exception of the Ministry of Health, safety equipment is dispersed to inspectors. Currently, most of the regulating authorities do not give much support to self-monitoring.

6.2 Analysis ofPhysical Samples ofEffluentsand Quality ofReceivingWaterBodies

The regulating authorities hire specialized skilled personnel to conduct direct sampling and analytical measurements of water including drinking water and wastewater. They also established certified and accredited testing laboratories to physically analyze samples of water including drinking water and wastewater effluent according to recognized standard procedures.

6.3 Area Monitoring

Earth Observation techniques are not currently used by regulating authorities in Egypt.Also, ambient monitoring is not used to study sediment deposition, reservoir morphology, water quality, tracing water pollutants.

6.4 CitizenComplaints

In Egypt, the information of the public is not considered sufficient to promote compliance with water legislations. There are slowly progressing processes to consult and/or promote public participation in water management implementation. The regulating authorities allow for public complaints to expose non-compliance with legislations. Some authorities have telephone hotlines for public complaints, and citizens' complaints are strongly followed up on.

7) Credible evidence for the Indictment of Violators

All Interviewees identified Inspection reports and samples collected at a particular time as the strongest and the most official evidence.
Other Items of evidence included dated photographs and examination of self-monitoring reports, although the authorities do not support self-monitoring in the first place, but maybe, conflicting information in those reports could provide more evidence against regulated parties.

7.1 Sampling and Analysis

The following criteria have been claimed important:

- Precision, accuracy and reproducibility of the analytical methods.
- Sensitivity and detection limit of the analytical methods.

- Reliability including routine maintenance and operation of sampling gears, measuring instruments, etc.
- Adopted Quality Assurance (QA) and Quality Control (QC) programs.
- Qualifications, training and competence of inspectors, field and laboratory operators.
- Proper documentation of sampling and analyses procedures are recorded, dated, and signed or initiated by the person who is in a position to testify regarding the presented facts.

7.2 Implementation of a Flawless Chain of Custody

Chain of Custody procedures for samples are not currently applied in Egypt.

7.3 Reporting and Documentation

There is a regular and transparent exchange of environmental information established and foreseen in water legislation; however, more cooperation between different authorities is needed, as so far, there is no “National Information system”.

The water & environment regulating bodies requesting details about the following:

- Sample collection date; time; locations; etc.
- Hydrographiccirculationpatternsorflow
- Methodsofcollection; and collector
- Methodoftransportation
- Meansofstorage
- Methods of analysis (standard method?)
- Methods of calibrations, quality assurance, quality control, etc.
- Elapsed time from sample collection
- Test results including quality control results such as field and laboratory blanks, duplicates, replicates, spikes and controls
- All calculations that impact test results and interpretation such as instrument calibrations, detection limits, method’s sensitivity and standards preparation.
- Inter and intra laboratory calibrations of measurements.

7.4 Expert and Witness Testimony

Water & environment regulating bodies in Egypt are usually reluctant in accepting an expert testimony on alleged facts presented in a noncompliance case.

7.5 Overall Assessment

Overall, it can be concluded that the level of compliance with Water and Environment Legislations is about 50%. The following challenges have been identified: Economic Affordability to comply with Regulations, Lack of economic incentives, lack of horizontal coordination, and Inadequate reporting systems. Most of the capacity needed to bridge the compliance gap is of technical nature, despite the fact that most of the interviewees did not recognize knowledge and technicalities as the main barrier, many of them expressed their need of enhanced equipment and expertise in relation to

sampling, testing, and quality assurance. Acquiring such equipment/ technology will be a good opportunity to enhance the technical capacity of staff involved as they will be provided extensive training.

The level of available enforcement capacities does not exceed 30 %, this is mainly attributed to the lack of political power possessed by ministries. In fact, compliance and enforcement are strongly inter-related, because the current public awareness of the low enforcement level does not enhance compliance. The legal and technical capacity of inspectors has also been identified as an issue that needs enhancement. The same technical capacity needed to assure compliance would also help in enforcement, but is of secondary importance compared to political power. An institutional reform may be needed to reassign and redistribute power to enhance law enforcement.

8) Final Observations

All Interviewees have complained that the Questionnaire is too long and needs 4-5 hours to be answered precisely, and to address all issues carefully. Officials on the managerial level cannot allocate all that time especially that the governmental working day doesn't exceed 6 hours. Many interviewees only completed the whole questionnaire out of their respect to the interviewer. Also, there was not enough moral incentive for the officials to give such a long interview, as they are used to foreign funded projects performing many surveys without changing much of their technical or institutional capacity.

9) References

- Ministry of Water Resources and Irrigation, 2007, National Water Resources Plan
- AbuZeid, K, and, Elrawady, M, 2009, Institutinal Mapping for the City of Alexandria, CEDARE/ SWITCH

Annex III: Assessment of the available enforcement capacity and mechanisms in Israel

1. Background (geographical, institutional, legislative)

The State of Israel main water sources include the Sea of Galilee (Lake Kinneret), the country's only freshwater source, the coastal aquifer that spans from Binyamina in the north to the Gaza Strip in the south, and the mountain aquifer that underlies the Judea and Samaria mountains. Israel is also traversed by dozens of rivers, most of them seasonal, whose waters flow to the Mediterranean, the Sea of Galilee, and the Dead Sea.

Israel's water sources are limited by the country's climate, geography and hydrology. Seventy-five percent of the annual rainfall is concentrated into four winter months. Rainfall averages up to 950 millimeters per year in some parts of Galilee in the north in contrast to 25 millimeters in the southern tip of the Negev. In the last years Israel has been facing a severe drought, which had not occurred in the last century. The annual precipitation level has been in continuous decrease far beyond the multi-annual average.

The Water Sector of the State of Israel has experienced, in the recent years, significant changes in almost all its aspects: physical, structural, legislative and organizational. During the last decade the decision makers came to understanding that the only possible way to cope, on one hand, with the natural water shortage, and on the other, with growing population and quality of life standards, is to adopt and implement as the national policy that integrates the management of water resources.

Major decisions have been made concerning construction of large scale sea water desalination plants, sewage collection and construction of effluents reuse treatment plants for agricultural needs, implementation of water tariff reform based on cost recovery principles, reorganization of municipal water sector, preparation of National Water Master Plan to 2050, initiation of water saving programs and media campaigns, preparation of rehabilitation of contaminated water resources plans, etc.

It was realized that the main flaws in the water management in Israel in the past have been a direct result of divided authorities for the water related issues given unreasonably to more than 10 ministries and governmental bodies. As a result, the Governmental Authority for Water and Sewage (the “Water Authority”) was established in 2007, replacing the organ of Water Commission and gathering gradually all regulatory bodies acting in the water aspects under one roof. The main purpose of the reform was to enable the Authority implementing an integrative management of the whole "Water Chain" and to transfer authorities from the political level of several ministers to one professional Board.

Today the Water Authority is in charge of management and regulation of the Water Sector in Israel, by implementation of the Water Law in all its aspects.

2. Identificationof national entities/institutions in chargeofmanagement, controlandenforcementofwater/environmentlegislation

(1) Deputy Director General (Regulation), the Water Authority.

(2) Head of the Water Quality Department, the Water Authority.

(3) Head of the Water and Sewage Corporations Department, the Water Authority.

(4) Head of the Water and Streams Department, Ministry of Environmental Protection.

(5) National Engineer for Drinking Water, Ministry of Health.

(6) DeputyDirectorGeneral (Engineering), the Water Authority**,** and, Head of Foreign Relations Unit, the Water Authority (The SWIM-SM National Focal Points).

3. Overviewofselected Laws andDecrees

3.1 Water sector legislation

The Water Law, 1959

The Water Law regulates the management of Israel's water resources, their preservation and their allocation for use. Enacted in 1959, and most recently amended in November 2010, the Water Law creates an administratively regulated water resources management. Pursuant to the Law all water resources in Israel are owned by the public (not by the state) and there are no private water rights or resources.

Neither private individuals nor the State own water resources. All water resources are public property. The State, through the Governmental Authority for Water and Sewerage (the "Water Authority") controls, manages and allocates the water resources as a trustee for the benefit of its inhabitants and for the development of the land. Water may be used only by permit issued by the Director of the Water Authority and for the water use purposes specifically listed in the Law (domestic, agricultural, industrial uses etc.) The right to use water terminates once the specific purpose of the use ceases to exist. The water entitlement is not an eternal one and is renewed annually.

The Law entrusts the Water Authority and its Director with the obligation, and ensuing powers, to preserve the country's water resources, in terms of quantity and quality, to regulate the production, supply and consumption of water, to determine priorities in case of shortage, to enforce environmental standards and prevent pollution of water resources, to design and implement water supply schemes, to regulate the payment for water, etc.

The main feature of Israel's water resources management is the fact that they are subject to an administrative regulation. Since there are no private water rights, water is allocated for use by the Director. The allocation of water is done by administrative decision. All water uses (production, supply, consumption, discharge and recharge) require an annual entitlement permit. In case of

water shortage, the Law allows the establishment of a special water supply regime that controls the allocation of water.

Israel's water supply system is operated by public and private water enterprises. A Government formed national water company – Mekorot – is responsible for bulk water supply in Israel, and operates the national water carrier that transfers water from Lake Kinneret (Sea of Galilee).

In order to facilitate the development of water supply systems, the Law introduces special planning procedures that take into account the unique character and needs of water infrastructure development.

Payment for water may either be in the form of a price negotiated between supplier and consumer or a tariff determined by the Board of the Water Authority. In addition to the price or tariff the Board may impose a differential (source based) extraction levy. The levy serves as a principal tool for regulating the use of different resources for water supply.

The Water Measurement Law, 1955

The Law stipulates that all paid-for water must be measured. Each consumer is required to have his own, separate, measuring device thereby ensuring that not only the supply is measured but also how much is consumed by each individual consumer. The Director of the Water Authority may order a self-supplying consumer to measure the water extracted by him.

By initiating, in 1955, the obligation to measure each water supply, the Government implemented a successful control mechanism over the country's water resources. The information derived on water supplied to and consumed by each and every consumer, allows the Director of the Water Authority to manage both the preservation of the water resources as well as to control their use.

The Water and Sewerage Corporations Law, 2001

Prior to the enactment of the Water and Sewerage Corporations Law, the municipalities, in accordance with their statutory obligations pursuant to the Municipalities Ordinance supplied water and sewerage services within their municipal boundaries. The Law provides for the gradual transfer of water and sewerage services from the municipalities to corporate entities.

The 2001 Law signaled a first step in the transformation of the administratively managed water sector to a more commercially oriented one. The objectives of the Law include, inter alia, the assurance of a high quality service (availability and quality) at affordable prices to all customers, the ensuring that income from the supply of the water and sewerage services will finance infrastructure investments, and the enabling of private sector investments for infrastructure, including through public-private partnerships (PPP's).

The process was initially a voluntary one, i.e. the municipalities had the opportunity transfer the service provision to public service entities (the "Water and Sewerage Corporations") and since 2007 it became compulsory. Nowadays approximately 80% of municipal water and sewerage services were transferred to Water and Sewerage Corporations. There are 55 Corporations that serve the area of 147 municipalities, and there is an ongoing effort to reduce the number of Corporations to 15.

The Corporations are subject to obligations in terms of supply coverage and level of service and are required to obtain a permit for their operation from the Water Authority. The tariffs and service charges for each of the Corporations are subject to review and approval by the Water Authority.

The Government may intervene in the operation of the Corporation, including transferring the provision of the services to another entity in case of failure in service provision, including in case of bankruptcy.

The Water Drillings (Control) Law, 1955

The Water Drillings (Control) Law regulates the drilling and installation of wells and stipulates that a permit issued by the Director of the Water Authority is required for these. Since ownership of the land does not entail the right to drill a borehole or to extract groundwater, a drilling permit is required also for the drilling of a well by a landowner for his own use.

An applicant for a drilling permit has to specify the drilling location, the quantity of water which the he wishes to draw from the well, if successful, and whether the proposed well is a replacement for an existing well or a new one.

The Law connects the drilling permit to the ultimate purpose of extracting water. The Law provides that one of the criteria to be employed by the Director of the Water Authority in considering a drilling permit application will be whether he will, ultimately, issue a production permit for the well. The Director may impose conditions upon the permit with respect to the diameter of the well, its depth or the amount of water to be drawn therefrom.

The permit holder is obliged to advise the Director of the Water Authority on the results of any trial extractions and may commence regular extraction from the well only if he holds a valid Production Permit and after a measuring device has been installed on the well.

The Law is an integral component of Israel's water resources management policy. It strengthens the control over water extraction by extending the licensing requirements also to the pre-extraction phases thereby strengthening the control over the use of the country's scarce water resources.

The Streams and Springs Authorities Law, 1965

The Law regulates the creation and operation of authorities for the management of streams and springs. Complimentary to the Water Law that created a framework for the nation-wide regulation of Israel's water resources, and the Drainage and Flood Control Law that regulates surface water drainage systems, the Stream and Springs Authorities Law decentralizes certain of the water resources management functions by allowing the assignment of some of these to Authorities that are granted jurisdiction over the drainage basin of a stream or other water source. The Authorities are composed of representatives of government, local municipalities, local water users and public representatives. The Authorities are entitled to regulate and/or operate streams (or part thereof) and springs with the view of maintaining a suitable water level. They are entrusted with the planning and demarcation of streams, with the maintenance thereof and the removal of any health hazards affecting the stream as well as the distribution of water from the stream to interested parties.

The Law must be read in conjunction with the Drainage and Flood Control Law since a Drainage Board may be entrusted with the functions of a Stream Authority as well. By combining the two functions, all relevant aspects of river basin management are regulated by a single body.

The Drainage and Flood Control Law, 1957

The Law regulates flood control and drainage activities for the protection of Israel's land and surface water resources. The Law stipulates that surface waters, including drainage waters may not be diverted from or to a waterway without a permit issued by the Director of the Water Authority.

The Law calls for the formation of a National Drainage Board that, together with regional, basin based, drainage authorities, regulates flood and drainage flows. The National Drainage Board comprises 20 members, 12 out of which are non-governmental ones, representing the agricultural sector. The National Board determines drainage policy and is in charge of the review and approval of local drainage plans.

The local drainage authorities are in charge of drainage regulation in their area of operation and are required, where need arises, to plan and construct drainage systems. The construction of a drainage system requires approval by the National Drainage Board.

3.2 Water environmental legislation

Water Regulations (Prevention of Water Pollution) (Rinsing of Containers for Spraying), 1991

These regulations prohibit anyone from emptying or rinsing chemical and/or biological substances or their residues from sprayers, collection tanks or any other installations into a water source, either directly or indirectly. They set specific requirements on the siting, construction and operation of rinsing installations. Specifications are set forth on size, sealing, operation and maintenance of the rinsate collection tanks and evaporation ponds.

Water Regulations (Prevention of Water Pollution)(Spraying Near Water Sources), 1991

These regulations prohibit aerial spraying of biological and/or chemical substances for agricultural purposes near a water source, including Lake Kinneret (Sea of Galilee), the open sections of the National Water Carrier, the Upper Jordan River and its tributaries, streams in the Kinneret drainage basin and other water sources used for drinking water. The regulations set limits on aerial spraying according to wind velocity and wind direction. Spraying from an airplane within 300 meters of a water source, or within 200 meters of certain specified rivers or within 50 meters of any other river is prohibited.

Water Regulations (Prevention of Water Pollution) (Gasoline Stations), 1997

These regulations, under the Water Law and the Licensing of Businesses Law, require specific conditions for the establishment and operation of gas stations. These include: installation of fuel-water separators, use of impermeable construction materials, special measures and equipment to prevent leakage and oil pollution, measures for protection against corrosion, and monitoring equipment and procedures. A primary requirement is for tanks to be installed in sealed dikes or double wall containers in accordance with established specifications. Other provisions relate to periodic leakage tests, measures to be taken in case of fuel leakage including reporting obligations and treatment, and requirements for permanently shutting down facilities. Additional measures are required in areas that are especially sensitive to pollution of water sources.

Water Regulations (Prevention of Water Pollution) (Fuel Pipelines), 2006

The Minister of the Environment, in consultation with the Minister of Health and the Water Council and with the approval of the Knesset Economic Committee, promulgated regulations on the prevention of water pollution from fuel pipelines in February 2006. The purpose of the regulations is to reduce potential risks from fuel transport pipelines, thereby preventing environmental degradation and pollution of water sources. The regulations set provisions for constructing, operating, maintaining, inspecting and testing fuel pipelines, impose reporting obligations in case of

leaks, and call for measures to stop and repair the damage caused to the environment as a result of such leaks.

The regulations require the following, inter alia:

- Informing the official appointed by the Environment Minister and the Water Commissioner about the submission of pipeline installation plans to planning agencies, including their exact location.
- Ensuring that the process of installing and operating fuel pipelines does not cause water or soil pollution.
- Adhering to procedures and standards for the construction and operation of fuel pipelines, which include safety factors such as depth of cover and minimum distances from water lines, cathodic protection, and leak control systems (Computational Pipeline Monitoring).
- Undertaking piping leak tests, continuous measurements and record keeping
- In case of leaks, taking measures to stop the leak and report the event.

3.3 Wastewater environmental legislation

Local Authorities (Sewerage) Law, 1962

The law prescribes the rights and duties of local authorities in the design, construction and maintenance of sewage systems. It requires each local authority to maintain its sewage system in proper condition. New sewage systems must be approved by regional planning commissions and by health and environmental authorities. The law also sets out sewer system charges and sewer system fees.

Model Local Authorities By-Law (Discharge of Industrial Sewage into the Sewage System), 1981

This model by-law sets recommendations to local authorities on the treatment and disposal of industrial sewage into the sewage system. It charges all generators of wastewater with responsibility for adequate treatment and disposal in such a manner as to prevent health and environmental nuisances and water source contamination. It provides local authorities with a legal tool enabling efficient supervision over industrial sewage, defined in the by-law as waste matter removed from an industrial plant by a stream of water.

The by-law sets forth prohibitions against the discharge of sewage from an industrial plant into the sewage system, requirements for sewage checks and tests and presentation of results to the head of the local authority, and requirements for granting a permit for sewage discharge to designated plants. The law also establishes a sewage tariff for the discharge of industrial sewage.

The by-law is not applicable in municipalities in which the water and wastewater is supplied, disposed and treated by a water and sewage corporation incorporated under the Water and Sewage Corporations Law, 2001.

Water Regulations (Prevention of Water Pollution) (Cesspools and Septic Tanks), 1992

These regulations place prohibitions and restrictions on the construction of new cesspools and septic tanks and on existing ones, including timetables for the gradual elimination of cesspools under certain conditions. The regulations prohibit the construction of cesspools for industrial wastes and prohibit the construction of domestic cesspools in settlements in which sewage systems exist. In

communities in which no sewage system exists, or exists in only part of the community, cesspools are prohibited in buildings serving more than twelve residential units. In such communities, domestic cesspools may be installed subject to specific conditions.

Water Regulations (Prevention of Water Pollution) (Reduction of Salt Use in the Regeneration Process), 1994

These regulations require industry to undertake a number of technical steps to bring about salt reduction in the regeneration of ion exchange in order to reduce the quantity of salt used in the water softening process and the consequent emission of brines into the municipal water system. The regulations call for the installation of a water meter for cumulative measurement of the quantity of soft water produced by the ion exchanger and the quantity of salt it uses for the regeneration process.

Routine sampling and analysis are required to follow up and to test various parameters including the hardness of the water reaching the plant, the quantity of soft water produced and the quantity of salt used. Owners are required to keep records of the results for a two-year period. Specific storage conditions for the salt are also required.

Water Regulations (Prevention of Water Pollution) (Evaporation and Storage Ponds), 1997

These regulations, promulgated within the framework of the Water Law and the Abatement of Nuisances Law, aim at preventing water pollution from evaporation and collection (storage) ponds, on the one hand, and at restricting their use, on the other hand. They are meant to prevent leaks from improperly sealed evaporation ponds used for industrial brines and effluents and from collection ponds serving for the storage of effluents and brines.

The regulations relate to evaporation and collection ponds at all stages, from planning and establishment to closure and cessation of operations. They prohibit the construction of evaporation ponds or collection ponds in all cases in which an economically viable and environmentally sound alternative is available for industrial effluent treatment. At the same time, they set conditions and measures to ensure that the construction and operation of such ponds will not cause water pollution, air pollution or odor pollution. Construction or operation of a pond is contingent on the fulfillment of technical instructions on different aspects of establishment, operation and maintenance including dual layering by sealing material, monitoring equipment and procedures, cleanup and disposal of sediments, etc. Specific measures are required in case of leakage or risk of leakage including reporting requirements and site treatment.

Water Regulations (Prevention of Water Pollution) (Prohibition on Discharge of Brines to Water Sources), 1998

These regulations prohibit the discharge of brines from ion-exchange renewal, from food, tanning and textile industries, and from hospitals to water sources and to the municipal sewage system. The regulations call for separating wastewater streams so that the brines are isolated from the rest of the wastewater. The regulations are meant to prevent salt enrichment of municipal sewage which is an impediment to effluent irrigation.

Water Regulations (Prevention of Water Pollution) (Sewage Disposal from Vessels), 1998

These regulations prohibit the discharge of sewage from a vessel to a water source, require commercial vessels to install adequate sewage collection facilities, and call for the establishment of

adequate reception facilities on shore. The regulations determine specifications for collection facilities and require vessels owners and operators to maintain record books with full details on each disposal. The regulations are aimed at preventing pollution in Lake Kinneret (Sea of Galilee).

Water Regulations (Prevention of Water Pollution) (Metals and Other Pollutants), 2000

These regulations were promulgated for the purpose of protecting water sources from heavy metals and other pollutants by limiting the volume of wastewater discharged from pollution sources and reducing the concentration of pollutants in it. The regulations set maximum concentration levels (expressed in milligrams per liter) for 20 pollutants.

A core provision of the regulations relates to the multiple use of counter-current rinse waters based on either 3-stage cascade rinsing or 2-stage cascade rinsing followed by an additional stage in which the rinse water is recycled. Fewer rinsing stages may be permitted if one of the following conditions is fulfilled: installation and operation of a rinsing system which reduces the quantity of rinse water by over 90%; installation and operation of a wastewater recycling system which reduces the quantity of wastewater by over 90%; or installation and operation of a recycling or disposal system for wastewater pollutants which reduces the concentration of the pollutant by over 90%.

Following are some of the salient provisions of the law:

- Prohibition on dilution of the wastewater in order to reduce pollutant concentrations.
- Prohibition on the discharge of wastewater to a pretreatment facility before undertaking all reasonable means to reduce wastewater quantities and to prevent and reduce drag out and pollutant emissions from the production process to the wastewater.
- Prohibition on the discharge of wastewater which is not pretreated in a pretreatment facility and whose pollutant concentrations exceed those specified in the annex.
- In the electroplating industry, prohibition on the discharge of wastewater in which the concentration of suspended solids exceeds the limited enumerated in the annex.
- Prohibition on the discharge of sludge from a plant except in accordance with the Licensing of Businesses Regulations (Disposal of Hazardous Wastes).

Business Licensing Regulations (Salt Concentrations in Industrial Sewage), 2003

The Business Licensing Regulations set threshold values for salt concentrations in industrial sewage. The regulations aim at reducing the salinity of sewage in Israel, which constitutes a major problem due to the country's use of reclaimed effluents for irrigation purposes. High levels of chloride, sodium and boron in Israel's sewage threaten to damage soils, reduce crop yields, and in certain cases, cause groundwater salinity.

The regulations set the thresholds for chlorides, sodium, fluorides and boron before being discharged to a wastewater treatment plant and prohibit dilution as a solution.

The regulations allow for imposing more or less stringent standards based on salt concentrations in the water supply to the industrial plant. More stringent thresholds may be imposed if there is reason to believe that the salinity of the effluents discharged from the treatment plant pose a real danger to the environment. On the other hand, easements of the standards are possible if the plant demonstrates that it uses best available technology to reduce pollutant concentrations in production and waste treatment processes, if the reduction of pollution concentrations will interfere in the

production process or damage the project, and in other specific cases which are enumerated in the regulations.

Water Regulations (Prevention of Water Pollution) (pH Values of Industrial Sewage), 2003

The purpose of these regulations is to protect the environment and prevent the pollution of water sources from the impacts of corrosion generated by industrial sewage by establishing pH values. The regulations prohibit an industrial plant from discharging sewage whose pH value is less than 6.0 or higher than 10.0 to the sewage system or whose pH is lower than 6.0 or higher than 9.0 to a reservoir, with some exceptions for specific cases. These include, among others, cases in which the pipe at the connection point of the plant to the sewage system or reservoir is made of materials resistant to a pH value between 5.0 and 6.0, cases where the mix of sewage discharged from the plant and flowing in the municipal sewage pipeline is not lower than 6.0 or not higher than 10.0 near the exit point from the plant, and cases where the quantity of sewage discharged to the municipal sewage system is less than 10 cubic meters per day.

Water Regulations (Prevention of Water Pollution) (Usage of Sludge), 2004

These regulations, prepared by the Ministry of the Environment in collaboration with the Ministry of Health and the Water Council, aim at preventing water source pollution and environmental degradation as a result of improper disposal of sludge originating in municipal sewage treatment plants. The regulations require wastewater treatment plants to stabilize and treat the sludge they generate as a condition for agricultural use or soil conditioning. The regulations establish maximum limits for heavy metal and pathogen concentrations and odor limits on sludge designated for agricultural use, set recording and laboratory testing requirements, define specific uses for different classes of sludge (A and B), set limitations on areas of sludge use, and prescribe requirements for warning signs, transport and storage. Requirements for class A sludge, which is virtually pasteurized and highly stabilized, will come into force three years after the regulations come into force.

Public Health Regulations (Effluent Quality Standards and Rules for Sewage Treatment), 2010

The stated aim of the effluent quality regulations, which were promulgated by the Minister of Environmental Protection and the Minister of Health in March 2010 , is to protect public health, to prevent pollution of water sources from sewage and effluents, to facilitate the recovery of effluents as a water source, to protect the environment, including ecological systems and biological diversity, soil and agricultural crops, inter alia, through the imposition of obligations and setting of instructions in accordance with the provisions of these regulations.

The regulations, which replace the 1992 regulations on wastewater treatment, set much higher treatment levels in existing and future wastewater treatment plants. They include maximum levels for dissolved and suspended elements and compounds and for 36 different parameters in effluents for unrestricted irrigation and discharge to rivers. Operators of wastewater treatment plants are required to treat the sewage according to best available techniques to as to ensure that effluent quality does not exceed the values stipulated in the annexes to the regulations.

The annexes set the required standards for:

- Effluents designated for unrestricted agricultural irrigation in general and effluents designated for irrigation in specific geographical areas of the country.

- Effluents in a small wastewater treatment plants which are designated for restricted agricultural irrigation.
- Effluents designated for discharge to rivers in a large wastewater treatment plant and in a small wastewater treatment plant.
- In all cases, when it comes to salinity levels, the wastewater treatment plant operator must assure that:
- the chloride level of the effluents does exceed 80 milligrams per liter above its concentration in the supply water;
- the boron level of the effluents does not exceed 0.3 milligrams per liter above its concentration in the supply water;
- the sodium level of the effluents does not exceed 60 mg/l above its concentration in the supply water.

Additional provisions in the regulations relate to the preparation of monitoring and control plans on the quality and quantity of sewage discharged to the wastewater treatment plant and to sampling and testing, at defined frequencies, at the exit of the wastewater treatment plant. Monitoring plans and results as well as sampling and test results are to be published on the websites of the Ministry of Environmental Protection, Ministry of Health and Water Authority.

3.4 Public health aspect of water legislation

Public Health Ordinance, 1940

The sanitary regulation of drinking water is entrusted to the Minister of Health pursuant to the 1940 Public Health Ordinance. The Ordinance empowers the Minister of Health to issue regulations inter alia on the sanitary quality of drinking water, on sanitary conditions of water resources supplying drinking water and on the sanitary conditions of the design, construction and operation of drinking water facilities.

Drinking water may not be supplied if it does not meet the sanitary conditions as established by the Minister. The Ordinance further requires that drinking water suppliers regularly control the sanitary quality of the water through recognized laboratories and stipulates that public health officials have the authority to ban the use of a water resource for drinking purposes if it does not meet the established sanitary standards.

The regulation of drinking water sources compliments the overall regulation of the water sector by the Water Authority. Thus for example, the producer of drinking water needs a production license from the Director of the Water Authority as well as a license from the Ministry of Health for the supply of the water for drinking purposes.

Pursuant to its authority, the Minister of Health has issued detailed standards on the sanitary quality of drinking water as well as regulations on the protection of resources that serve for the extraction of drinking water.

The Minister of Health has also issued regulations that determine the standards and quality of treated wastewater, and impose certain duties on the owners and operators of wastewater treatment facilities. The purpose of these regulations is to prevent pollution of water sources from

sewage and wastewater, enable the utilization of wastewater as a source of water, and protect the environment, including ecosystems and biodiversity, soil and crops.

4. Approachesfor Compliance andEnforcement

4.1 The Voluntary Approach

The voluntary approach is not likely to be implemented in Israel. The level of social participation in the water segment in Israel is fairly low. One of the interviewees suggested that the lack of involvement derives from high income tax levels that creates a feeling of "I paid – now it's the government turn" among the citizens.

4.2 The Command & Control Approach

The Command and Control Approach is the central approach adopted by the regulating authorities in Israel. It is complimented by the market based and economic incentive approach, especially in the water legislation.

The current level of fragmentation in the legislations is relatively low. Following the establishment of the Water Authority in 2007, the fragmentation was substantially decreased. Nowadays, there is still some fragmentation in the sewage and wastewater segments and in the regulation over agricultural water quality.

4.3 Market Based/ Economic Incentive Approach

The water tariff regime in Israel offers economic incentives on water savings and conservation, and it also includes progressive tariffs on water consumption to promote prudent use of water. However, some claim that the tariff regulation towards the water suppliers is too complex and as a result, the economic incentives integrated therein are not clear enough.

In addition, the regulators provide economic incentives for water quality protection efforts, such as reduced extraction levies for water producers that improve the water quality.

4.4 Risk Based Approach

There are quality standards for most types of water in Israel. The water, public health and environmental legislation clearly define the standards for drinking water, effluents and wastewater, seawater etc. However, several types of waters, such as wells improvement, fish farms and stream water, require completion. The standards were determined based on the EPA and the WHO standards, and in some cases on the standards in Australia and New Zealand, and were adjusted for Israel.

All the water extraction and consumption in Israel is measured, as well as wastewater discharges to the fresh water. The majority of the water extraction is constantly monitored by remote sensing and there is a continuous monitoring of certain parameters of drinking water and wastewater (chlorine, residual chlorine, turbidity, conductivity, pH, etc.).

There are adequate capacities to assess releases from point sources. The capacities to assess releases from non-point sources are insufficient.

5. FactorsAffecting Compliance andEnforcementofWater& Environment Legislations

5.1 Deterrence

Most interviewees believe that there is a fair chance that, under the current circumstances, water and environmental violations will be detected. However, due to the lack of proportionate and intermediate sanctions, the response for such violations will be, in many cases, slow and ineffective.

5.2 Economic Factors

All water consumed in Israel are subject to tariff. Tariffs for consumers are set gradually to promote rational use of water. The tariffs are usually based on recognized cost, and are designed to promote effective use of resources. However, some claim that the tariff regulation towards the water suppliers is too complex and as a result the economic incentives integrated therein are not clear enough.

5.3 Institutional Capacity and Credibility

The main gap in the current regulation is the lack of exercisable sanctions and enforcement capabilities. In addition, there is a shortage of professional manpower in the water sector.

5.4 Social Factors

Most interviewees believe that the incentive to comply with the water regulation is only moderately influenced by a genuine desire of the regulated entities to conserve water and improve the environmental quality or by fear of "loss of prestige".

5.5 Psychological Factors

The water sector has been undergoing several significant reforms in the recent years. These reforms include the establishment of the Water Authority, implementation of water tariff reform, large scale sea water desalination, the reorganization of municipal water sector and the incorporation of the Water and Sewage Corporations, etc. These rapid reforms may create some concern of changes among regulators and regulated bodies alike.

5.6 Knowledge and Technical Feasibility

The level of knowledge and technological capabilities in the water and environmental sectors in Israel is relatively high, and does not represent a barrier to compliance with water and environment legislations.

6. Monitoring of Environmental Compliance

6.1 Types and levels of Inspection

The control and monitoring systems in Israel include technical specifications and standardized methods for analysis and monitoring of the water status. There are excellent inspection and

monitoring capabilities in the environmental sector, and relatively good capabilities in the water sector.

6.2 Analysis of Physical Samples of Effluents and Quality of Receiving Water Bodies

All the laboratories that test water samples, whether for the Water Authority or for the Ministries of Environmental Protection and Health, have certifications of the highest level, including QA procedures and ISO 17025. The laboratories follow strict procedures regarding all aspects of collection and analysis.

6.3 Area Monitoring

Almost all the water production in Israel is remotely measured. There is a continuous monitoring of certain parameters of drinking water and wastewater (chlorine, residual chlorine, turbidity, conductivity, pH, etc.). In addition, remote sensing and over-flights are used to monitor hot springs in the Kineret and the Mediterranean Sea and a little bit in streams.

6.4 Citizen Complaints

All the regulating authorities have established an information centre and public inquiries call centre. The Ministry of Environmental Protection is also maintaining a hotline to report violations of environment legislations. Furthermore, water and sewage corporations are subject to service standards and criteria that are enforced by the public through a mechanism that entitles consumers with compensation for failure to meet them.

7. CredibleevidencefortheIndictmentofViolators

7.1 Sampling and Analysis

All the laboratories that test water samples, whether for the Water Authority or for the Ministries of Environmental Protection and Health, have certifications of the highest level, including QA procedures and ISO 17025.

7.2 Implementation of a Flawless Chain of Custody

The laboratories follow strict procedures regarding all aspects of collection and analysis including, inter alia, chain of custody.

7.3 Reporting and Documentation

The Water Authority publishes the water quality in the entire country on its website. Annual reports are also published on the Ministry of Environmental Protection website. Also, every Water and Sewage Corporation is required to provide water quality data at its website.

7.4 Expert and Witness Testimony

Environment regulating bodies accept an expert testimony whenever applicable.

8. Overall Assessment – compliancewithwater/environmental legislation

8.1 Level of compliance with water/environmental legislation

The overall level of compliance with water and water related environmental legislation in Israel is satisfactory. Most interviewees assessed the levels of compliance with water legislation between 80%-90%, and with environmental legislation at approximately 70%-80%.

8.2 Main challenges, gaps and constraints towards improved compliance

There is a shortage of professional manpower in the water sector.

The coordination between the governmental bodies' databases is lacking. Each of the Ministries - the Ministry of Environmental Protection, the Ministry of Health and the Water Authority are using a different database, and there is no linkage between them.

Some claim that the tariff regulation towards the water suppliers is too complex and as a result the economic incentives integrated therein are not clear enough.

8.3 Identification of opportunities and capacity needed to bridge the gaps

Many of the interviewees suggested that legislative reform can be useful in improving compliance specifically, enhancement of administrative enforcement tools and extending the inception of the regulation on sectors in which the level of regulation is relatively low, such as the rural sector.

9. Overall Assessment – enforcementcapacitiestoenforcewater/environmental legislation

9.1 Level of available enforcement capacities to enforce water/environmental legislation

Although the level of compliance with water legislation is slightly higher, the general feeling is that the level of enforcement in the environmental sector is better, mainly due to more flexible enforcement tools and the ability to impose financial sanctions.

9.2 Main challenges, gaps and constraints towards improved enforcement capacities

The main gap in the current regulation is the lack of exercisable sanctions and enforcement capabilities. The enforcement is not sufficiently addressed in water legislation. The Water Law provides draconian tools, such as license revoking and criminal offences, that are very severe and therefore rarely used. In addition, fines and penalties that are imposed through criminal proceedings, involve complex and long litigation. These proceedings take time and do not allow for a swift response.

There are not enough intermediate and proportionate sanctions, such as administrative fines, that will enable the regulating authorities to enforce compliance with the provisions of the law. The result is sub-enforcement and un-deterring punishments.

There are not enough administrative powers and no sufficient support from the criminal prosecution authorities.

9.3 Identification of opportunities and capacity needed to bridge the gaps

Almost all interviewees pointed out that enforcement capacity building is required in order to improve the compliance with water and environment legislations. The majority of the interviewees also believe that increasing the number of professional and well trained inspectors in the water and environment sectors will significantly improve the enforcement as well.

Annex IV: Assessment of the available enforcement capacity and mechanisms currently practiced in Jordan to enforce water legislations

1 Background (geographical, institutional, legislative)

Jordan has embarked on a multifaceted agenda of social, economic, and political reforms, with the aim of building a modern state based on economic vitality with substantial potential for growth and prosperity, political inclusion, and social stability.

Jordan's reform agenda includes legislative, administrative, and judicial reforms to enhance the efficiency of the public sector, enhance investment environment, and ensure the strict and transparent implementation of the rule of law. Legislative reforms included amending and enacting numerous laws and regulations, as well as streamlining of investment related laws. As for monetary and fiscal reforms, efforts have been undertaken by the Government of Jordan in order to strengthen fiscal discipline, reform tax system, maintain stable exchange rate, and sustain high levels of foreign currency reserves.

The EU supports Jordan's moderate and stabilizing role in the Middle East, paving the way for further political and economic integration and liberalization.

Jordan is a partner country within the ENP since 2004. Within the European Neighborhood Policy (ENP), Jordan is the first Mediterranean partner country with whom the EU has concluded technical negotiations leading to an "Advanced Status" which means closer cooperation.

Jordan has taken steps towards reform and is therefore included in the renewed EU policy with Southern countries.

The EU dedicates considerable financial resources to support Jordan's National Agenda and to ensure the best results for its partnership with Jordan, in terms of political, economic and overall social and legal reform.

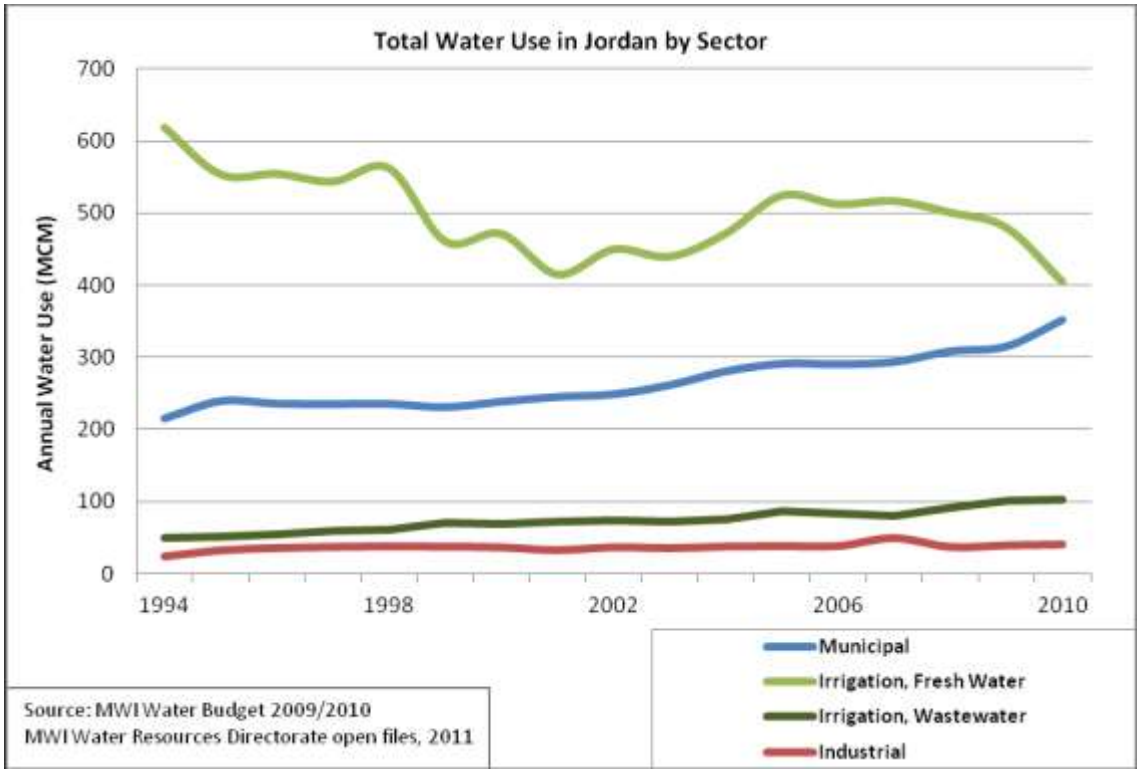
The EU also works closely with Jordanian authorities and civil society organizations in Jordan to ensure the efficiency and effectiveness of technical and financial cooperation with Jordan. Since 1995, assistance provided by the EU has mounted to over €500 million. Main priorities include:

1. Support to Jordan's reform in the area of democracy, human rights, media and justice
2. Trade, enterprise and investment development
3. Sustainability of the growth process, including human resource development and the development of new or alternative energy sources.

Jordan enjoys a semi-arid climate in the northwestern part of the country to arid desert in its eastern and southern parts. Jordan is subject to periodic droughts that may extend to several years in duration. Water supply from surface sources has been declining substantially during the past decade. Jordan is among the lowest in the world on a per capita basis at 147 m3 per person per year in 2010. Renewable water resources have fallen below 130 m3 per person per year. Current total uses exceed renewable supply. The difference (the water used that is not renewable) comes from nonrenewable and fossil groundwater extraction and the reuse of reclaimed water. If supply remains

constant, per capita domestic consumption is projected to fall to approximately 90 m3 per person per year by 2025, putting Jordan in the category of having an absolute water shortage that will constrain economic growth and potentially endanger public health (REVIEW OF WATER POLICIES IN JORDAN AND RECOMMENDATIONS FOR STRATEGIC PRIORITIES, 2012 USAID report).

Water Use by Sector since 1994 (source – Review of Water Policies in Jordan 2012 USAID)



Due to the ongoing Syrian situation, the number of Syrian refugees in Jordan is expected to triple to 1.2 million by the end of the year (2013) according to UN officials. This magnifies the stress on water resources and sanitation services and infrastructure.

2 Identification of national entities/institutions in charge of management, control and enforcement of water/environment legislation

This report summarizes the results of an assessment of the water enforcement capacity and mechanisms in Jordan to enhance compliance with water legislations and standards.

The assessment included meetings, discussion sessions and the distribution of the pre-designed checklist. The following entities were contacted/ consulted on the subject according to their mandate/role in water compliance and enforcement.

- Ministry of Water and Irrigation (MWI) – SWIM Focal Point
- Water Authority of Jordan (WAJ)
- Jordan Valley Authority (JVA)
- Ministry of Environment (MoEnv)

- Ministry of Health (MoH)
- Water Reuse and Environmental Conservation Project (USAID funded)
- Inspection Reform Program (IFC/Word Bank)
- Royal Scientific Society (RSS)

In addition, several reform initiatives with a focus on monitoring, inspection and enforcement were examined. Below are some highlights of key proposed reforms and development aspects for the water sector.

In 2004, the Ministry of Environment – as a recently established Ministry - commenced a full-fledged legal and institutional strengthening imitative funded by the EC under the Support to the implementation of the Jordan-EU Association Agreement Program. The work included a legal gap analysis and legal upgrading master plan; functional review and re-structuring, cross-agency coordination, establishment of new departments/functions and training of staff on various best practices. This was followed-up by a project to build capacity of the Ministry's directorates in the governorates and design a decentralization strategy for the environmental functions including inspection and enforcement. The mandate of the MoEnv to draft/enforce legislations in the water sector is prohibited by provisions in the WAJ law. However, in 2002 (before the MoEnv was established); the Prime Minister issued a resolution granting the General Corporation for Environment Protection the responsibility of overseeing and managing industrial waste and wastewater. This has not yet been translated into a legal act despite the draft Environment Protection Regulation prepared with assistance from the EU project for the MoEnv. The MoEnv is contracting the Royal Scientific Society (RSS) to perform limited number of sampling and testing for wastewater.

This came in line with the government socio-economic reform agenda that identified environmental protection and inspection and enforcement as one of the national objectives. In a marked step towards unifying and strengthening the enforcement power, Jordan established its Environmental Rangers Department that aims at enforcing all legislations related to environment including those of water and wastewater.

In 2008, the IFC has carried out an inspection reform needs assessment based on which an inspection reform strategy was endorsed by the Cabinet of Ministers. Two pilot projects were implemented as part of those efforts; one at the Ministry or Labor and the other at the Ministry of Environment. The IFC findings related to the water sector and the impact of current inspection practices on enterprises indicated that there is an overlap in responsibilities related to water inspection between several entities. The report analyzed the mandate and role of each entity and the non-compliance actions mentioned in each legislative instrument. It is clear from the report that the Ministry of Water and Irrigation, Ministry of Health, Ministry of Environment, Great Amman Municipality, and Jordan Standards and Metrology Organization need to discuss and agree on an inspection approach that optimizes government resources and supports decision-making process.

Thus, this assessment comes in a time where Jordan is considering several reform policies for the water sector including those developed through EU funded projects as well as others proposed by USAID and GIZ projects. The latest updates on this are summarized below based on the Institutional Support & Strengthening Program (ISSP) currently implemented by USAID.

Key problems facing the water sector in Jordan are:

- Overlapping mandates and functions between various authorities
- Conflict of interest between regulators and water suppliers
- Hidden and distorting subsidies such as the below-market electricity tariffs
- Incomplete corporatization of utilities management and governance
- Low political support for serious and participatory debate and decision-making for water policies
- Weak incentive systems and accountability measures for various water users

Three main changes are foreseen needed in the water sector institutional setup in order to better meet the challenges associated with this scarce resource in Jordan.

1. Sector restructuring to:
    a. Consolidate water resources planning and management functions in the MWI.
    b. Create a National Water Council (NWC) with top-level authority to push for critical reforms and prioritization on the national level.
    c. Focus the functions of WAJ on bulk water supply development and distribution.
2. Utility reform to:
    a. Complete the process of corporatizing utilities.
    b. Improve governance and management.
    c. Create an independent Water Utility regulatory Commission (WURC) to oversee the economic and customer service functions of WAJ and the fully corporatized utilities.
3. Water User Association (WUA) strengthening in the Jordan Valley leading to a shift in tertiary-level water management from JVA to local WUAs.

Such changes would need to be supported by a comprehensive legal framework under a unified water framework law as well as a mainstreamed approach within other sectoral policies and legislations. The Water Law forms a keystone to pull the sector together in one of most critical times for Jordan. Equally important is the institutional and technical capacity development needed to carry out the reform program.

3 Overview of selected Laws and Decrees:

Legislation is a tool to implement policy in Jordan. The legislative hierarchy has its peak at the Constitution level. Then comes the laws which are proposed by the Cabinet of Ministers, debated at both houses of the Parliament and then issued for enforcement by a Royal decree. The detailing of the laws comes in by-laws (Regulations that are passed by the Cabinet of Ministers and issued with a Royal decree; and Instructions that are more technical and issued through the relevant Ministry/regulator). Administrative decisions (by Ministers and Prime Minister) are also common in Jordan and need to conform to the provisions above mentioned framework.

It should be emphasized that the monitoring, inspection and enforcement functions need to be clearly addressed in the new water law as well as the introduction of incentives and other approaches to enhance compliance. In addition, the MoEnv is considering submitting an amendment

to the Environmental Protection Law to reflect the EU project recommendations as well as to address other issues related to inspection and enforcement.

It is a golden opportunity to mainstream such priorities into the drafted water law and the environment law, if they are not yet taken care of. Considering the recommendations from various reform projects could give valuable input into that law.

The Water Authority of Jordan (WAJ) law 18 of 1988, the Jordan Valley Authority (JVA) law 30 of 2001 and the Ministry of Water and Irrigation (MWI) law 54 of 1992.

WAJ Law:

It was essentially promulgated to establish and regulate WAJ which was established as an autonomous corporate body, with financial and administrative independence. It is authorized to institute legal proceedings, own movables and real estate, acquire water rights by purchase or acquisition, conclude loans, accept grants or contributions and sign contracts. It is to carry the full responsibility for all water and wastewater systems and the related projects and shall set forth a water policy.

According to the law, WAJ shall take the necessary action to ensure technical control and supervision regarding the construction, operation and maintenance of all water projects and public or private sewers. Obtain data and information regarding the needs of the country and the actual consumption of water for different uses, and utilize such data for future planning, to provide for the Country's needs for water and to conserve its consumption.

This law stipulates that all water resources available within the boundaries of the country, whether they are surface or ground waters, regional waters, rivers or internal seas are considered State owned property and shall not be used or transferred except in compliance with this Law.

The law specified penalties of no less than a six months sentence, and no more than twoyears imprisonment or to a fine no less than JD 1000 and no more than JD 5000, or bothpunishments if any, inter alia, of the following acts is committed:

Polluted any water resource, which is under the management or supervision of WAJ directlyor indirectly, or caused its pollution and failed to remove the causes within the period fixed byWAJ.

Drilled unlicensed ground water wells or violated the conditions of the license issued to him.Also a sentence of no less than one month, and no more than six months, imprisonment or afine not less than JD 100 (1 JD = 0.7 US$) and not more than JD 1000, if any, inter alia, of the following acts iscommitted:

The illegal usage of water, water resources, related projects or the public sewers, contravening the provisions of this Law, or other pertinent issued regulations, including the selling, granting or transporting water, using or utilizing it or committing any act that may cause harm or damage to any of these resources or water related projects, or using the public sewers in a manner that conflicts with the provisions of this Law.

Carrying out any works regarding water or wastewater without obtaining the licenses, permitsor approvals required under this Law. Or carrying out any of these works in violation of theregulations issued.

JVA Law:

The water acquired by means of projects constructed by the JVA and which were not used or exploited for irrigation purposes in any area prior to the declaration of a water settlement in accordance with the land and water settlement law in effect, shall be considered Governmentproperty. Such waters may be sold, leased, or otherwise disposed of in a way as may be decided by the JVA Board. JVA determines allocation and usage of surface and ground water, developed under its supervision, in accordance with guidelines issued by the Cabinet of Ministers upon JVA Board recommendations. Before constructing any irrigation projects, JVA has to consider the rights to water in the Water Register. Excess water is considered Government property. JVA divides irrigable lands into farm units and exercises its authority on them in many ways as set by the Board. One of which are the set of regulations for controlling the use of water in farm units. Control includes basis for water supply or barring it. Determining the maximum quantities to deliver in accordance with water availability and the nature of the crops planted in the unit. Water prices, however, are determined by the Cabinet of Ministers upon recommendations from the Board.

JVA implements water quality testing programs in an effort to identify pollution causes. It ismandated to punish polluters, by cutting off water supply to farming units in which pollutionwas found. Water supply is only resumed when pollution is removed by the owner of thefarming unit.

MWI Law:

MWI By-Law 54, 1992 is the Regulation for the Administrative Organization of the Ministry ofWater& Irrigation. According to this law, three bodies are attached to the Minister are MWI, WAJ and JVA. Under this regulation and with due observance to the provisions of the aforementioned WAJ and JVA laws, MWI is entitled to assume full responsibility for water and public sewage in the country. It is to develop and communicate water policy to the Council of Ministers for adoption. Also, MWI shall assume full responsibility for the economic and social development of the Jordan Valley as well as carry out all the works which are necessary for achieving this objective.

By this Regulation, the Directorate of Planning, Development & Information (DPDI) is required to participate in setting a strategy for the water sector, preparation of programs, conducting and evaluation studies pertaining to economic, social and population feasibility pertaining to water policy. Formulate work plans proposals on the productivity of MWI manpower. Participate in conducting studies on water resources, evaluation and determination of the productive capacity; formulate the basis for its preservation and protection from pollution. Conduct studies, compile and organize the information water quality, industrial waste, follow up of changes in the water specifications and propose the necessary solutions for their treatment. By this regulation, DPDI is also expected to establish a computerized Information Bank in order to analyze and classify the information on the water sector and its development.

Groundwater By-law and Wastewater By-law

The ground water regulations address the abstraction of ground water and establish a licensing system for abstraction. The wastewater bylaw deal with the protection of water from certain wastewater discharges.

Both Bylaws should be improved to comply with international legal standards. Moreover the existing water legislation should be harmonized in order to avoid overlapping of legal competences and related activities, such as monitoring, inspections, enforcement rights. The development of a water

law could be a legal breakthrough to address water protection issues comprehensively like the existing health law does on protection of health.

Temporary Public Health Law No. 54 of 2002:

It stipulates that the Ministry of Health (MOH) shall in coordination with the relevantauthorities; control the potable water, regardless of its source, in order to ensure its fitnessfrom health point of view. MOH is entitled to control potable water resources and theirnetworks, in order to ensure that they were not exposed to pollution. It is also to have controlover the method to be used in the treatment, transmission, distribution, and storage ofpotable water, in order to ensure the availability of health conditions in such processes, including the quality of materials used in the potable water processes, its transmission, distribution, and packing, as well as the prevention of using any material that may harm theconsumer's health. Any person who is responsible for a water resource, network, station, orpotable water bottling factory must inform MOH or WAJ, or both of them, as the case may be, of the occurrence of any pollution to the water placed under his supervision.

Environment Protection Law No 52 for 2006

It is questionable to which extent the MoEnv is competent to draft legislation. According to Article 25.3 the MoEnv is entitled to draft water protection regulations to be adopted by the Council of Ministers.

On the other side there is in force the Water Authority Law (18/1988) which states that the Ministry of Water and Irrigation is responsible to draw the water policy of Jordan (Article 5). Furthermore the water authority council has the right to decide upon any draft law or regulation related to water (Article 10). Finally, the law states that “official and governmental departments are prohibited from acting upon water and water discharge issues if this is deemed interfering with the water authority competences” (Article 27).

Consequently, the Ground Water Control Regulations 85/2002 and the Waste Water Regulations 66/1994 have been drafted by one of these authorities without involvement of the MoEnv (or its processor). Pursuant to Article 13 of the Administrative Organization Regulation for the Ministry of Water & Irrigation (law 54 of 1992) the Directorate of Legal Affairs within that Ministry shall prepare draft laws, regulations and instructions.

Therefore, it is highly doubtful that the MoEnv has any legal drafting competences in the field of water protection although it claims responsibility for the monitoring of water quality.

Article 7 of the Environmental Protection Law is the only rule that deals with inspection and enforcement rights. However, this provision is not addressing all monitoring and inspections aspects sufficiently. Neither proper enforcement procedures nor inspection rights and obligations are regulated yet adequately. The function of the newly created environmental rangers as concerns enforcement activities in the industrial sector is also not yet legalized. Basic monitoring rules are lacking, too.

The EIA Regulations regulate the approval process of a project; there are no environmental licenses issued so far within this process although the so-called licensing committee is involved into the decision making (but its role is not clarified by law)

No environmental license system for industrial operations exists yet. However, as far as it concerns conditions these may be incorporated legally into management-plans issued with the EIA approval.

The EIA procedure contains some other elements related to licensing, for instance post-licensing monitoring aspects.

- **EIA regulation** (for permitting of new projects).
- **Environmental Inspection Regulation** (and Environmental Auditing Instructions): A manual was also prepared in cooperation with IFC.
- **Draft Water Protection Regulation** (never pursued for discussion and approval – prepared through EU project).
- **Draft Liability Regulation** (never pursued for discussion and approval – prepared through EU project).
- Amendment (draft) to the Environment Protection Law (EU, USAID, EPA).

Other special Laws that might have an impact on permitting of projects and on inspection and enforcement:

- ASEZA Law and its Environmental by-law (particularly for marine protection)
- DFZC Law and its draft Environmental by-law
- Petra Authority Law

Several Technical Standards and Quality Standards (issued by JSMO but drafted in cooperation with concerned entities). There are even more than those in the table but not being enforced.

Prime Minister's decision based on recommendations from Minister of Water in 2002 in which the responsibilities of industrial waste monitoring and inspection are granted to the General Corporation for Environment Protection which was later on in 2003 transformed into the Ministry of Environment.

4 Approaches for Compliance and Enforcement

4.1 The Voluntary Approach

It is clear that Jordan is not yet ready for the voluntary approach. Nevertheless, almost all entities admit that the awareness is increasing and some people and facilities are abiding by legislations on voluntary basis. This is dependent on several factors such as: public awareness, advocacy from civil society organizations and community associations, and availability of funds to invest in compliance and best available technologies and practices. People see this coming but in a long time with emphasis on need to be well equipped when this becomes the norm.

It was mentioned by one entity that there is no active NGO that focuses totally on water protection and management and that activities of NGOs related to influencing sectors like industry and hospitality are very limited. For the record, there are around 62 NGOs that claim to work on environmental issues in Jordan in addition to several other development NGOs. A lot on community engagement and consultation is still needed.

It is very much related to donor funding and thus, it is important to mobilize and direct NGOs towards the real policy priorities that they can advocate for in the water sector. It is probably that people and facilities do not see the big issue coming when water becomes a scarce commodity. The pricing and allocation policy is not reflecting this upcoming challenge.

4.2 The Command & Control Approach

While all of the entities agree that the command and control approach is the most effective one for Jordan; each entity described the issues from its own perspective. Very few people had the bigger picture and the national overview. All agreed that an effective use of this approach requires serious reforms and capacity building.

Many thought the questions in the checklist are sensitive or political! Others didn't want to document their views and some were very critical of the other entities and players in the water field. All of that reflects a real gap in the cascaded and mainstreamed understanding of the different roles and responsibilities that each entity/sector can play within the water management field. It is obvious that decision-making and policy development is done in a centralized and narrow approach while execution involves many layers and levels of technical practitioners most of which are too busy to dig for updates on national or international levels.

The water sector is suffering from structural and functional weaknesses (please see the above introduction section) that result in accountability and transparency gaps. Overlapping authorities exist due to lack of consolidation in the legal and governance frameworks. Water monitoring, inspection, management and enforcement lies within the mandate of the following entities. Even within a single entity, several departments and units suffer from overlapping and weak coordination.

- Ministry of Water and Irrigation,
- Water Authority of Jordan, and the WAJ laboratories,
- Jordan Valley Authority,
- Ministry of Environment, and Royal Environmental Rangers,
- Ministry of Health,
- Jordan Standards and Metrology Organization
- Municipalities,
- Royal Scientific Society and other outsourced entities,
- Ministry of Agriculture.

Legislative framework: as described in the introduction section, fragmented with no clear allocation of responsibilities. A golden opportunity exists to reform this while a new Water Law is being drafted and the Environment Protection Law is being amended. The chance to ensure that both laws clearly address issues and allow for further detailing in bylaws is essential.

The Government needs to show seriousness in pursuing those reforms which is challenging at this stage but would be detrimental if postponed. Water tariffs and illegal pumping are two crucial elements. It all drains down to the level and effectiveness of enforcement.

Sectoral legislations and guidelines need to be developed starting with priority sectors (quantity and quality wise). Some water demand management guidelines were developed but never enforced.

Wastewater monitoring especially from industrial sources seem to be the major institutional and technical challenge since it is under the MoEnv responsibility. Most entities realize the limited capacity and resources at MoEnv to do that task. Outsourcing to RSS is a feasible option but it needs

to be enhanced and well managed and analyzed for proper enforcement especially as this is directly impacting investors and SMEs.

4.3 Market Based/ Economic Incentive Approach

There is a consensus that Jordan doesn't have any real tools to promote such approach. On the contrary some entities mentioned a controversial response from the government towards propositions from private projects to adopt water conservation or management measures. This can have an adverse image on the potential quality investments and technologies that may see Jordan as a destination for green and responsible development.

4.4 Risk Based Approach

There is no evidence that regulators are using a risk-based approach for monitoring and inspections. Except for a couple of initiatives (at the Development and Free Zones Commission and the Ministry of Environment) to introduce the concept, there is no national monitoring system that is based on risk. Some argue that the health aspect is stronger than the environmental aspect in this regard.

Economic incentives need to be legalized in the Laws rather in bylaws. The polluter pays principle and the response to violations as well as pollution permits need to be addressed. The Legal Master Plan prepared for the MoEnv by the EU as well as the several projects for MWI can provide input into the legal reform process.

Good models need to be tested and implemented. For example, the IFC inspection work with MoEnv, the Development and Free Zones Commission model in risk-based permitting and inspection (EU supported), sectoral guidelines for chemical industries by US EPA. Such pilots were developed and tailored for Jordanian context and couldn’t materialize on the ground.

The Environment Fund (under the MoEnv) needs to be re activated based on its original vision and priority should be given to water and wastewater improvements.

5 Factors Affecting Compliance and Enforcement of Water & Environment Legislations

5.1 Deterrence

Expectations of ability to detect violations are moderate (higher in water than in environment). Response to violations seems to be soft lately and there is no differentiation between various levels of violations/impact on water and environment.

5.2 Economic Factors

There is a lack of linkages between compliance and economic/financial savings; probably due to the subsidized prices of water and lack of incentives for water saving and protection. MoEnv inspectors claim to include it in their face-to-face inspection visits to industries.

5.3 Institutional Capacity and Credibility

Institutional framework: legislative reform should be accompanied by an institutional restructuring for the whole sector as well as a governance framework that enhances accountability and

transparency. The establishment and/or strengthening of inspectorates in various Ministries need to be well thought of in light of the mandate and functions.
Cross-agency coordination and cooperation: this needs to be ensured on top level (as in the National Water Council) and on operational level to ensure cascaded vision and policy direction to those in the field.
Through a multi-ministerial platform (task force or committee), design a national risk-based water monitoring and inspection program in which resources can be put together to develop a comprehensive strategy and operational plan that covers water resources and wastewater effluents. Donors can then bridge gaps and supplement resources. The Royal Rangers may be the most staffed and equipped agency toconduct inspections after some technical and specialized training.
The political power of the MoEnv has been decreasing and the quick change in Ministers is delaying progress and reducing productivity. Assigning Ministers who already are in charge of other Ministries makes it impossible to get strong support and attention to the MoEnv. This is probably related to the political reform priorities and government need to reduce expenditures.
The environmental requirements related to economic development is not clear and the procedures need revision and improvement to positively reflect on the doing business climate. The government needs to identify sectors/clusters that need to be given urgency due to their added value economic impact and agree amongst various regulatory bodies to define smooth processes for their approvals (example: solar energy, ICT, tourism, special development zones that conduct SEA on their Master Plans etc).
Lack of financial support is recognized and the main source of assistance seems to be the donors. This is expected to continue as the budgetary constraints remain significant.

5.4 Social Factors

There is no current practice of announcing golden or black lists of businesses when it comes to water and environment. It is important to define procedures to socially promote responsible businesses. Some claim it is illegal to do so (confidentiality)!

5.5 Psychological Factors

Recent attempts to reform permitting and inspection systems show that resistance and de-motivation of staff are key factors hindering enforcement and compliance. For example the MoEnv is faced with lots of resistance from various stakeholders and internally towards improving its permitting procedures and inspection methods.

5.6 Knowledge and Technical Feasibility

It is known to many that the knowledge and technical capacity of the water sector staff is higher than those of the environment sector in issues related to water protection and monitoring. However, the extent to which technical feasibility is being considered in compliance promotion is apparently limited. The main input would come during the formulation of quality standards which are mainly based on international standards. Many argue that those standards and technical issues are not localized based on national context. If Jordan is to use those due to its international commitments, national capacity and knowledge needs to be upgraded extensively especially in light of rapid change in the technology trends and solutions. Otherwise, competiveness will be negatively impacted in trade and economy.

Knowledge available in universities and research institutes like RSS need to also be enhanced to accommodate latest global trends and needs. Specialties like environmental economics and water economics/accounting are rare.

6 Monitoring of Environmental Compliance

6.1 Types and levels of Inspection

In the case of water, sampling and testing is done internally while for environment, MoEnv outsources RSS and some universities to do that on its behalf based on signed agreements. The main shortcoming noticed is the use of the information generated by RSS for future planning and decision-making by MoEnv which hardly does the minimum analysis of the reports received.

MWI/WAJ/JVA do not recognize themselves as inspectorates. They do not have such a function/department and they claim it is monitoring of water resources only. MoH has permitting and inspection all in one department. MoEnv has an inspection department that works almost in isolation from the licensing department and the monitoring department.

Training is needed on institutional level and across the relevant authorities. It has to be built in the systems with budget allocated. Training needs assessment is required to define basic and specialized topics in addition to soft skills. Training should include on the job programs that are tailored for each function/entity and should be also sustainable and upgradable.

Formal adoption and effective implementation of the developed systems such as the inspection manual at MoEnv need to be ensured. Harmonized donors assistance is needed to ensure optimum use of resources and coordinated efforts.

6.2 Analysis of Physical Samples of Effluents and Quality of Receiving Water Bodies

There isn't a single integrated monitoring system on the national level but rather several programmes set by individual ministries.

Current scope of monitoring (source: Jordan Country Report prepared under ENPI/SEIS):

The ground water network includes 116 recorders to measure level of water in full wells. The 12 ground water basins and 108 controlling wells are measured manually by devices prepared for this purpose.

Jordan has one public network (groundwater and lakes) that provides surveillance monitoring and quality control; the water uses concerned include drinking water supply and irrigation. The MWI keeps a record of the amounts of water used.

In terms of monitoring, the Ministry of Environment conducts monitoring in 5 main sectors: groundwater (10 locations), dams (10 locations), valleys, municipal waters and industrial wastewaters in 8 sectors including pharmaceuticals, refinery, slaughter houses, textile sector, chemical sector (14 industrial installations and 3 main treatment plants). Periodic testing is carried out once every 4 months. Development of self-monitoring is one of the priorities of the Ministry. With regard to domestic wastewater, 33 plants are regularly monitored. Eleven stations belonging to hospitals and other public administrations are also monitored.

The MWI has developed GIS-based digital tools for Water Master Planning activities, offering the framework, databases and tools necessary to manage water data and providing water specialists with data and information for water sector monitoring, management and planning. Software based analysis and planning tools such as WEAP, WIS, ArcGIS and PIS are in use and integrated into the Ministry's planning and operations processes.

Jordan has developed the use of treated urban waste water for irrigation in the Jordan Valley and has introduced advanced tools for water resource management e.g. real-time meters.

MWI is managing an integrated Water Information System –WIS - collecting or interfaced with all the existing information systems in the other "water sector" entities. The WIS (Oracle data base and applications) provides a comprehensive set of data for the water sector. A web based interface is available on the water sector intranet for remote use of WIS, but the number of users remains limited.

Various external governmental entities are undertaking water quality monitoring of surface water (EMARCU on behalf of several Ministries), industrial waste water (MoEnv through RSS), waste water reuse for irrigation (MoA), drinking water resources and supply, bathing waters, effluents from public and private waste water treatment plants (WAJ and MoH).

A recent assessment by the WHO for the drinking water quality monitoring systems identified several issues related to protection and compliance. The current institutional arrangements, practices, and procedures in managing water supply systems are laboratory-based without any proactive measures being taken to control potential quality problems based on risk assessment and risk management.

Due to the nature of the currently adopted laboratory-based quality management system, laboratory technicians and other concerned staff (at MoH and WAJ) are over burdened with monitoring parameters to satisfy the technical regulation requirements despite the fact that a high level of confidence that certain parameters within some of the water systems will not exceed defined limits. On the opposite side, more samples than required for monitoring and verification are taken in case of nonconforming test results.

The WHO findings recommended that stakeholders need to shift to risk-based management system as outlined in the WHO guidelines to be able to focus efforts on high risks that may affect water quality and minimize monitoring over parameters with no potential risk.

There seems to be a good perception of the capacity of laboratories and the accredited tests available. USAID is also assisting in enhancing this capacity through work with WAJ labs, 3 universities and RSS. It is essential to understand the various services provided by those labs and ensure quality service to various clients. The issue of conflict of interest or commercializing is mentioned by some entities as some of those labs perform testing for both regulators and industries. Clear and transparent procedures are needed to ensure credibility and accountability. Defining the tests that need to be performed and accredited is also necessary.

6.3 Area Monitoring

EMARCU/RSS is a real time monitoring project for 13 main surface water bodies in Jordan.

A cross-agency management committee oversees EMARCU work that includes reps from various line Ministries that may benefit from the data and readings (MWI, MoEnv, MoH, MoA, etc).

Ministries are not maximizing use of EMARCU data as they don't access the system regularly and don't have pre-set operational limits for parameters in order to trigger action.

Major challenge is that Jordan has no Standard for surface water quality! To overcome this, EMARCU is working with the committee to develop what is called Trigger Values to indicate pollution based on various Ministries' needs and mandate. These values need to be approved by the committee.

Another challenge is that the parameters measured by EMARCU are limited and do not include BoD. They are mainly; PH, temperature, turbidity, EC, COD and Total Nitrogen & Total Phosphorus.

Daily readings are sent to all Ministries but it is not EMARCU who issues decisions.

Decision-support knowledge and experience is still lacking amongst regulators.

Labs perform requires tests as per standards and legislations without revision of needs based on status of water and environment.

6.4 Citizen Complaints

Most Ministries seem to have procedures for complaints but there is no evidence that those procedures are used to respond to citizens complaints. In addition, information provision to citizens and public is still weak and lacks institutionalization. Follow-up on complaints seems to exist for written complaints in particular.

7 Credible evidence for the Indictment of Violators

7.1 Sampling and Analysis

The common evidences used are the same and there is nothing against using more advanced techniques if they become available and accessible to inspectors.

7.2 Implementation of a Flawless Chain of Custody

Answers show weak understanding of this aspect and more adherence to what is stated in the legislations and standards/codes.

7.3 Reporting and Documentation

It is not a problem according to the interviewed entities, however, there is a need to standardize and institutionalize reporting and documentation and ensure proper exchange of information for various purposes. Use of electronic systems is also a need especially for maintaining linkages between various departments/entities. Indicators and benchmarks need to be defined and agreed upon amongst all stakeholders with clear measurement responsibilities.

7.4 Expert and Witness Testimony

Not very common but allowed and some entities have already pre-approved certain experts to provide advice. Testimony is still uncommon and very much subject to court procedures.

8 Overall Assessment – compliance with water/environmental legislation

8.1 Level of compliance with water/ environmental legislation

There is a consensus around the need to enhance compliance. Expectations are more positive for the water than the environment sectors.

8.2 Main challenges, gaps and constraints towards improvedcompliance

Lack of clear requirements for compliance for various sectors.Lack of awareness of impact of non compliance on competitiveness and economic feasibility.Low water pricing.

8.3 Identification of opportunities and capacity needed tobridge the gaps

- Common points include legal and institutional overlaps and weak coordination and communication (finalize the water law and amend environment law and issue relevant by-laws).
- Update the relevant quality standards and issue ambient standards.
- Capacity building and training but linked to mandate and functions.
- Equipments and integrated electronic systems for data and reporting (including GIS).
- Training: economic tools, wastewater related training (for MoEnv), technical feasibility, etc.
- Establish risk management unit.
- Inspectorates outside Amman are needed.
- Municipalities to be engaged.
- Reform permitting and inspection processes. Define objectives and targets beyond quality standards.

9 Overall Assessment – enforcement capacities to enforce water/environmental legislation

9.1 Level of available enforcement

Capacities to enforce water/environmental legislationStronger in water than environment according to interviewed entities

9.2 Main challenges, gaps and constraints towards improved enforcement capacities

- Legal overlaps and weak institutional coordination.

- Lack of qualified staff (at MoEnv).

9.3 Identification of opportunities and capacity needed to bridge the gaps

- Outsourcing and cooperation agreements can resolve staff shortage problems. Restructuring and reallocation of staff might be needed too.
- Utilize Royal Rangers for law enforcement (they need to be trained and equipped).
- There was some training conducted for judges and prosecutors but are those trained still handle environmental cases?
- Revisit penalties provisions in water and environmental laws.
- Elaborate procedures and tools for calculating violations.

10 Final remarks:

- First step is to bring all entities to one table to discuss openly what is needed to resolve the issues of overlap between them. Decision-makers as well as technical people need to be there. All requested a workshop to discuss each others' responses on this checklist and potential solutions.
- Formal communication with both MWI and MoEnv to check status of water law and environment protection law and provide recommendations to cover issues arising from this assessment.
- The key capacity and institutional support aspect is to develop risk-based national monitoring and inspection plan and cascade roles within the various authorities to implement such plan. This would entail information management, training, reporting and documentation etc. It would lead towards revision of some standards and requirements.
- Public engagement and stakeholder consultation in decision-making and prioritization. Special focus on NGOs and community associations and their potential role in raising awareness, advocacy and changing practices within different sectors.
- Databases and information management systems: an interface for public use needs to be established and made available on various platforms. Credible information needs to be easily accessible by citizens and residents of Jordan.
- Capacity building needs to be institutionalized within all sector players according to mandate and functions. Government needs to acknowledge needs within the sector even if being met by donor agencies. Non-conventional topics need to be included in the training programs such as economic and technological aspects of water management and compliance. Impact of climate change and other global factors need to be included. Links with research and academia to identify best and most feasible technologies and practices for Jordan are very essential.
- Revisit committees and their mandate/role: several water monitoring committees exist based on cabinet of Ministers (or single Minister) resolutions. Also, a committee chaired by

the Ministry of Planning and international Cooperation on doing business and competitiveness environment exists but needs further re activation as a platform to discuss permitting and inspection systems for economic activities. An Inspection Steering Committee was established in addition to a technical one to work on enhancing coordination between inspecting agencies with support from IFC inspection reform program. This also needs re activation through the Ministry of Industry and Trade. Such committees can be excellent platforms to enhance coordination, raise awareness and build capacity of various government agencies on what each of them is doing and how to make the best use of the existing data and information.

- Donor coordination needs to be more solid to build on completed work and push for sector reforms and development. The sustainability of projects and interventions after funding is over is an important aspect that needs to be decided upon from the early design stage.
- A high employees turnover is found almost everywhere in the public sector. Financial and non-financial incentives need to be created to retain experienced staff. Tools to utilize nation-wide expertise are needed and should be discussed and approved by government entities.

11 References to existing legislation, published reports or any other related literature:

1. IFC Jordan Inspection Reform Project, Phase II final report, 2008.
2. USAID Review of Water Policies in Jordan, 2012.
3. MoEnv Legal Upgrading Master Plan, EU institutional strengthening project 2008.
4. Jordan National Water Strategy, 2009.
5. ENPI/SEIS Jordan Country Report, 2010.
6. Legislations mentioned in the report.

Annex V: assessment of the available enforcement capacity and mechanisms currently practiced in SWIM-SM region to enforce water legislations, case of Lebanon

Introductory Note

This report is prepared as an assessment of the available enforcement capacity and mechanisms currently practiced in SWIM-SM region to enforce water legislations in Lebanon. This assessment is based on the meetings held with the identified water and environment officials at the national authorities in Lebanon:

1. Mrs. Mona Fakih: Water Director at the Ministry of Energy and Water (MoEW) and SWIM focal point.
2. Mrs.MirvatKreidiyeh: Head of water quality unit, MoEW.
3. Mr.BassamSabbagh: Head of urban environment unit at the Ministry of Environment (MoE) and liaison office at SWIM.

Those officials were found to be most knowledgeable about the subject matter and secured some free time to complete the check list.

1. Legislative and Institutional Background

The supply for drinking water in Lebanon was long managed through water authorities on regional or sub-regional levels and in many villages it used to be managed by municipalities. Wastewater used to be under the responsibility of the municipalities.

In 2000, law number 221 (and its amendment law 241 of the same year) addressed the water and wastewater sectors in Lebanon and is considered to be an important major act for the reform of the water sector. The main headlines of those laws can be summarized as follows:

1. All water authorities (21) were merged into four main Water Establishments (WE):
    a. Beirut and Mount Lebanon Water Establishment (BMLWE)
    b. North Lebanon Water Establishment (NLWE)
    c. South Lebanon Water Establishment (SLWE)
    d. BekaaWater Establishment (BWE)
2. The Water Establishments have the following main responsibilities:
    a. Management of the water resources and infrastructure
    b. Planning and Execution of regional projects
    c. Operation ofdistributionnetworks
    d. Collectionofwatertariffs
3. The MoEW have the following main responsibilities:
    a. Development of national strategies and master plans
    b. Execution of major water resources development projects

c. Overseeing the activities of the Wes

4. The full responsibility of the wastewater sector (networks, WWTP, etc.) was transferred to the WE

Factual Notes

In accordance with the meetings held for the purpose of this project, below is a short summary list of the overall current situation of the water sector in Lebanon:

1. The WE are financially independent Government owned establishments that provides water through distribution networks and collect the necessary tariffs directly from individuals
2. The water tariff is generally collected once per year which is a flat rate of around 157 USD
3. Trials are being conducted in some regions with water meters where tariff is than relative to the quantity consumed; however, problems are being reported since the water is not supplied continuously
4. In most regions, water is normally supplied three times per week for 6 to 9 hours; thus, water is practically stored in tanks for continuous usage
5. Some areas in Lebanon do not have water supply networks and rely on private delivery tankers or groundwater wells
6. The WE are responsible for water quality supplied by the networks and accordingly they have been setting up laboratories and have been hiring qualified people for that purpose. The MoEW provides follow-up and support, and oversees water quality since central laboratories at the MoEW were recently closed and testing is only done at the WE or at certified private or public laboratories on a need basis
7. The WE are assuming gradually the wastewater responsibility since it is still a new field to them that require specialized skills
8. Projects related to water and wastewater are in many cases executed by the Council for Development and Reconstruction (CDR) or the MoEW especially large projects or projects under loans agreements than it is transferred to the concerned WE
9. WEs have been receiving in the past years various type of assistance especially capacity building and Institutional Strengthening from international organizations such as the German Technical Cooperation (GIZ) and United States Agency for International Development (USAID). Furthermore, the WEs have been receiving much of infrastructure type of support by USAID through DAI and other international agencies or donors
10. The WEs lacks human and financial resources to be able to provide adequate services
11. The Ministry of Health (MoH) is not involved in permitting for water sources to test its suitability for drinking water; however, the MoH is involved in investigating major events that has an impact on public health
12. The MoE is mostly responsible for providing permits for WWTP and industries that may result in negative impacts on the Environment and public health through the review of Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA)
13. In 2001, the MoE has set in ministerial decisions 52/1 and 8/1 the standards for discharge of treated wastewater in water bodies or the wastewater networks.

CHECK-LIST NOTES

In this section, some general notes taken from the meetings held with the ministries' officials are highlighted on each of the check-list topics related to the current cases in Lebanon.

2. Approaches for compliance & enforcement with water and environment legislations in SWIM countries:

i. **Voluntary approach:** the approach is always applied by NGOs, organizations or individuals; however, there is no assistance or encouragement in the current laws.

ii. **Command & Control Approach:** this is mostly implemented; however, the laws may lack some execution decrees and may be ambiguous in some sections. In addition, it should be noted that Governmental agencies often lack the financial and human resources for the proper implementation.

iii. **Market Based/Economic Incentive Approach:** The tariff should be linked to the real consumption and water should be continuously supplied. In addition, incentives shall be given when adopting water conservation techniques.

iv. **Risk-based Approach:** There is significant amount work to be done under this approach for having a well maintained and usable database.

3. Factors affecting compliance & enforcement of water & environment legislations

i. **Deterrence:** Political support is needed to apply sanctions.

ii. **Economics Factors**: Awareness is highly needed nationwide with seriousness in enforcing sanctions.

iii. **Institutional Capacity and Credibility:** There should be a political will while providing the necessary human and financial resources.

iv. **Social Factors**: These factors are essential since social media is playing an important role recently in all sectors in Lebanon.

v. **Psychological Factors:** People in Lebanon do not really trust the Government and its institutions although significant efforts were done in the past years.

vi. **Knowledge & Technical Feasibility**: Technology and Knowledge are not really the barrier but the lack of resources normally is.

4. Monitoring of Environmental Compliance in SWIM-MS countries

i. **Types & Levels of Inspection**: Significant effort is really needed to build a reliable sustainable national monitoring program.

ii. **Analysis of physical samples of effluents and quality of receiving water bodies**: Skilled personnel are being hired recently at the WE for water quality monitoring and laboratories are being equipped at the WE.

iii. **Area monitoring:** Monitoring is needed from the supervising units or governmental agencies to approve the work of the WE

iv. **Citizen complaints**: Citizens have always complaints; however, the WE are performing to their best possible level. In some cases, citizens do not even bother by complaining anymore

5. Credible evidences for the indictment of violators of water & environment legislations:

i. **Sampling and analysis:** The sampling and analysis of distribution water is normally undertaken by the WEs; the MoEW assumes the role of supervision and monitoring over the WEs. In the cases of discharge of treated wastewater in the Environment and Water bodies, the MoE is responsible for monitoring including sampling and analysis in case needed.

ii. **Implementation of a flawless chain of custody:** The decrees need to clarify those events and accordingly no pre-set clear procedures are being undertaken.

iii. **Reporting and documentation:** Reporting and documentation are still weak or not conducted regularly except for water distributed in the network by the WE; however, there are no water information system in place.

iv. **Expert and witness testimony:** Experts testimony can be accepted at the court of Law depending on the cases.

The evidences are always needed especially when problems are addressed on the Law Courts; however, this issue requires more implementation decrees that set up procedures for adoption of monitoring approaches in order to achieve compliance and penalize violators.

6. Overall Assessment:

In the opinion of the MoEW, the "Code de L'eau" is an important document that organizes and regulates the water usage and consumption; however, it is still under draft study phase at the council for ministers. A political decision is needed for final review and adoption of the "Code de L'eau".

Overall Assessment– compliance with water/environmental legislation:

1. **Level of compliance with water/ environmental legislation:** the level of compliance with water/environmental legislation is still estimated at below 50 %.
2. **Main challenges, gaps and constraints towards improved compliance:** The main challenges and constraints can be summarized in the lack of awareness, lack of financial resources and incentives, lack of coordination between different governmental sectors, overlapping of certain legislations and lack of technical capabilities.
3. **Identification of opportunities and capacity needed to bridge the gaps:** A Political will along with strong financial and human resources support are needed to bridge the gap and achieve compliance.

Overall Assessment– enforcement capacities to enforce water/environmental legislation:

1. **Level of available enforcement capacities to enforce water/environmental legislation**: The enforcement capacities are still weak in Lebanon.
2. **Main challenges, gaps and constraints towards improved enforcement capacities**: The main challenges/constraints towards improved enforcement capacity are the lack of up to-date legislation and lack of institutional capabilities.
3. **Identification of opportunities and capacity needed to bridge the gaps**: Legislative and institutional reforms are essential pillars towards enforcement of water/environmental legislations.

FINAL REMARKS:

Overall, based on the above sections and in accordance with the attached check list, following is a short summary of the assessment on enforcing water legislations:

1. The political will for a real change is a starting point for enforcing water legislations.
2. Complete collection of water tariffs with a decent supply of water is a step to allow enforcement.
3. Awareness and enforcement should advance in parallel and sustainability should be ensured.
4. WE and related ministries should be supported with the needed financial and human resources to be able to implement the legislations.
5. Economic incentives should be a main tool towards compliance with water and environment legislations while penalization is tool to deterrence.
6. Institutional reform is a major step towards advancing for compliance with water and environment legislation.

Annex VIAssessment of the available enforcement capacity and mechanisms currently practiced in SWIM-SM region to enforce water legislations, case of Morocco

1. Background (geographicalandinstitutional)

1.1Geographicalbackground

The primary characteristic of surface water resources in Morocco concerns their geography. Unlike the situation in many North and West African countries, crossing rivers originate within its borders and flow out on its shores. This eliminates any problems on sharing these resources (and therefore potential conflicts) with neighboring countries.

However, although the first characteristic of surface water resources is an asset, another characteristic of water resources is rather a handicap: the climatic and hydraulic environment of the country is particularly difficult.

Indeed, precipitation patterns vary greatly between regions and display high irregularity as concerns location and time periods, on both a seasonal and inter-annual basis. Thus, the average contribution of surface water per year ranges between a few million m3 for the poorest basins and billions m3 for the most advantaged basins.

The third characteristic of water resources concerns the type of precipitation. This usually occurs in the form of violent flash floods promoting accelerated flows towards the sea at the expense of infiltration into the groundwater flow. These floods are recorded in an estimated average of 20 to 30 days for basins in the south and two to three months for the northern basins and Moulouya.

Finally, there is also an alternation of high rainfall sequences and severe drought sequences, which can last several years.

If added to the strong agricultural orientation of the economy, this all complicates the situation and makes rigorous management of these rare and irregular resources vital for the country.

These various characteristics of water resources and, in particular, their frequency and unequal distribution, require the construction of large dams and reservoirs to store the contributions of wet years for use in dry years. They also require, where possible, implementation of water transfers from water-rich to water-deficient regions to promote a balanced economic and social development throughout the territory.

Therefore, in addition to intensive groundwater use, a very aggressive policy of dam construction was initiated during colonization (Morocco was called to play the role of a granary for the colonial authority) and has continued since independence (especially during the reign of His late Majesty King Hassan II), which now allows for a storage capacity of 17 billion m3 of surface water over a total capacity shared by rivers crossing the country of 21 billion m3. Thus, Morocco now has 128 dams, with a storage capacity of 17.2 billion m3, 13 water transfer works and major groundwater exploitation works.

Today, in an average rainfall year, this water infrastructure allows a total volume of surface water around 16 billion m3, of which nearly 20% is allocated to drinking water.

In addition, 4 billion m3 of groundwater are actually mobilized and used.

These generally satisfactory results have been achieved through effective institutional organization and rational, efficient and effective management of research, equipment, inventory, preservation and allocation of water resources between different users, as exercised by a strong General Water Directorate (DGH), independent of its contemporary supervisory authority (first the Ministry of Public Works, later the Ministry for Equipment).

1.2 Institutionalbackground

The institutional structure of the sector has changed significantly since the 1970s. However, it has allowed the sector to operate smoothly through a clear definition of the responsibilities of stakeholders, identification and undertaking of functions essential to implement and distribution of roles and responsibilities to support the development of the sector.

This institutional organization efficiency may be explained by the underlying principles, respect for which has been successful systematically:

- All powers and functions necessary for sector development are represented and supported.
- All sector stakeholders are represented.
- Powers and functions are assigned to the entity or agent most competent for their implementation.
- Such entity or agent enjoys the necessary autonomy to act, or at least, a connection to the best equipped Ministry, armed with the most expertise and human resources to support them in this task.
- The institutional structure is based on four distinct and clearly defined intervention levels: advisory capacity, sectoral planning capacity, operational capacity and water users.

2. Identification of national entities/institutions in charge of management, control and enforcement of water/environment legislation

In the current institutional structure of the sector, the implementation laws and decrees relating to the regulation of water resources and the environment are enacted and operated by and under the responsibility of the Ministry of Energy, Mines, Water and the Environment; the Water Department deals specifically with Law 10-95 on water (Mr. BENOMAR, Director of Research and Planning of Water Resources in this department, being the focal point of the SWIM program), while the Department of the Environment is concerned specifically with the laws and decrees related to environmental impact studies and waste discharge into the environment.

Therefore, our choice of interviewees naturally relied initially on the selection of entities and operational executives in these two departments (water and environment) of the Ministry of Energy, Mines, Water and the Environment, which are:

- The Directorate of Water Research and Planning within the Department of Water

- The Directorate of Regulation and Control within the Department of the Environment.

Moreover, among other stakeholders in the sector, the two operational entities that we felt were best placed both to appreciate our concerns and enlighten us in our overall assessment of the situation were the National Office for Water and Electricity (ONEE, single national operator) and the Ministry of Health (department with main competency over the health aspects, in addition to the protection of resources and the environment, which enforces compliance with the law among stakeholders).

We thus completed the initial list of two operational entities within these other two sector stakeholders:

- The Directorate of Sanitation and the Environment within the ONEE,
- The Directorate of Epidemiology and the Fight against Diseases in the Ministry of Health.

The table below lists the entities and individuals interviewed:

Department	Capacity	Contact
Ministry of Energy, Mines, Water and the Environment -Department of Water.	Director of Water Research and Planning. SWIM focal point	+212 537 778 690
Ministry of Energy, Mines, Water and the Environment -Department of the Environment.	Director of Regulation and Control	+212 537 576 635
	Head of the Department of Control in the Directorate of Regulation and Control	+212 537 570 635
Ministry of Health.	Head of the Department of Environmental Hygiene within the Directorate of Epidemiology and the Fight against Diseases.	+212 537 671 174
National Office for Water and Electricity (ONEE).	Head of the Department within the Directorate of Sanitation and the Environment.	+212 537 759 600
	Head of Service within the Directorate of Sanitation and the Environment.	+212 537 759 600

3. Overviewofselected Laws andDecrees

The Moroccan legal instruments relating to the regulation of water and the environment thereof can be summarized/outlined in three sets:

1. Water Code or Law 10-95 on Water (Annex I copies the different laws and guidelines for the implementation of these texts.)

This law regulates all aspects (including environmental aspects) related to hydraulics and aims to achieve the following objectives:

- "Coherent and flexible planning of the use of water resources, at both river basin and national level;
- Optimal mobilization and rational management of all water resources, taking into account the order of priority established by the National Water Plan,
- Management of water resources in the context of a geographical unit, the water basin,
- Protection and conservation of the quantitative and qualitative water public domain as a whole,
- Proper water management to assist in the design of the use and control of the aforementioned operations, involving public authorities and users, in any decision-making involving water."

2. The law on environmental impact assessment, which includes, under penalty of prohibition of exploitation, the systematic preparation of environmental impact studies prior to commissioning any project expected to affect the natural environment and the requirement to put in place cleaning equipment and infrastructure to comply with waste disposal standards (to be downloaded from the website of the Ministry of Energy, Mines, Water and the Environment, Department of the Environment).

3. Laws and decrees relating to waste disposal into the environment (to be downloaded from the website of the Ministry of Energy, Mines, Water and the Environment, Department of the Environment).

Other pieces of legislation relating to the environment may refer to water resources as a supplement, but they make reference to Law 10-95 and relate to three natural areas: Air, Soil and Water without focusing specifically on water resources.

4. Approachesfor Compliance andEnforcement

4.1 The Voluntary Approach

The application of this approach would require a long transformation process of society and its attitudes as well as the adoption of new tools by the regulatory authority.

4.2 The Command &Control Approach

The Moroccan reality, mentality and awareness of the Moroccan population, as well as the mode of operation of its institutions, favor the application of this approach.

4.3 Market Based/ Economic Incentive Approach

The application of this approach would require significant budgets. This does not preclude tentative steps towards practical implementation which remains marginal [see establishment of FODEP (or Industrial Depollution Fund)].

4.4 RiskBased Approach

The application of this approach would require the transformation of the mode of operation of the institutions (identification and classification of risks and developing strategies to manage these risks).

5. FactorsAffecting Compliance andEnforcementofWater& Environment Legislations:

5.1. Deterrence

In the current circumstances, the Ministry has few human and material resources to carry out inspections. However, when it comes to drinking water and sanitation, particularly discharges into the networks of large cities and small and medium towns, operators (ONEE and Municipal Governments) act as relays and operate controls as part of their internal procedures or those of the Ministry.

Regarding penalties due to non-compliance with the legislation, it can be roughly said that impact is not proportional to damages effected; waste treatment is charged at a very low cost as part of the general user charges while fines for pollution remain symbolic.

5.2. EconomicFactors

There are formal procedures for calculating fines and fee scales but these fines remain symbolic. There is no specific budget to support actions promoting compliance with the laws. Initially, the FODEP (Industrial Depollution Fund) was to help companies comply with standards and legal provisions but there has been only limited success with businesses.

5.3. InstitutionalCapacityandCredibility

On the legislative front, the legal arsenal is complete, consistent and does not require a priori to be supplemented or amended. However, challenges/difficulties in institutional organization still exist and must be dealt with/overcome:

In the current situation, conflicts persist between stakeholders for the redistribution of functions, including security matters (police water functions) and standardization.

These conflicts greatly slow down the process of issuing enforcement guidelines for laws and the formulation of required standards. These will not be overcome unless the Ministry of Energy, Mines, Water and the Environment gains legitimacy in its role as legislator, controller and regulator.

5.4. SocialFactors

Social factors have little involvement in the poor enforcement of regulations. It is only for coercive laws and regulations that people need to be convinced about compliance with the rules.

5.5. Psychological Factors

Same as for social factors (see § 5.4. above).

5.6. Knowledgeand Technical Feasibility

The administrative environment and economic sector (businesses in the sector) will help overcome any knowledge of technology issues. Moreover, the latter, given the existing economic sector (existing industrial processes) are generally not complex. Finally, the Ministry regularly publishes brochures to explain and popularize (to be downloaded from a website).

6. Monitoring of Environmental Compliance:

Compliance monitoring is performed on the basis of sectoral strategies (currently strategies have been developed for four sectors including textiles and paper pulp industries). This strategy is based on campaigns rather than inspection programs. Inspections are the responsibility of the Water Police under the Water Department and the basin agencies in terms of Law 10-95 and the responsibility of inspectors under the Environment Department as concerns legislation on environmental impact studies and waste discharge. Inspections are conducted during campaigns with a view to ensuring the entire set of legal requirements. The most effective controls are those made prior to the start of the activity (impact studies) and those made in the context of a flagrante delicto situation. The regulation on impact studies make inspections unnecessary for ensuring that pollution control equipment is installed since the commissioning of industrial activities involved is conditional on the prior installation of this equipment. On the other hand, human and material resources are lacking for the systematic inspection of their condition; however, users fear greatly the occurrence of incidents that may threaten the health or public order. The drain on resources must be simple to obtain authorization for (documents to provide: more typical application procedure downloaded from the website of the Regional Directorate). If functioning without authorization (flagrante delicto), the installation is removed and a fine set. The authorities regularly publish brochures of popularisation and awareness and awareness campaigns are carried out on the airwaves (radio and television).

6.1. TypesandlevelsofInspection

Regarding drinking water, the necessary inspections are carried out as part of the internal procedures of operators, irrespective of supply and context (large, medium, small towns and rural areas). For the rest, operators act as relays for the administration which organizes control campaigns in line with its limited resources. Control of the provisions of Law 10-95 is the responsibility of the Water Police attached to the basin agencies and control of the other environmental laws relating to water resources lies within the competence of inspectors attached to the Directorate of Control and Regulation within the Ministry of Energy, Water and the Environment. The inspectors and members of the Water Police have received and are still receiving training. Their salaries are provided by the entities to which they are attached. Measurement systems and methods are defined in the context of law implementation guidelines (processes are still under preparation). There are certified laboratories, but this is not the case for all laboratories involved (except for drinking water). In addition to documentation relating to internal procedures of inspection management, inspections and actions of the Water Police and environmental inspectors are archived in the departments under which such agents fall and eventually, in the case of a public health incident or disturbance of the public order, by the other departments involved in the action (Country Police, City Police). Because of the fact that the Water Police interventions in private property are conducted in the

company of traditional public order enforcement agencies responsible for managing conflicts, its members enjoy de facto the necessary protection against attacks that may occur.

6.2. Analysis of Physical Samples of Effluents and Quality of Receiving Water Bodies

The analysis system for the potability of water and its purification (when this is provided by the operators) is fully developed and meets international quality standards both in human and material terms. Apart from those dedicated to drinking water and sewerage, laboratories are still undergoing certification.

6.3. Area Monitoring:

Monitoring and management (mapping, coding, identification, testing, flow measurement, protection) of water resources is the responsibility of the Ministry and is one of the most important aspects of the work of the Directorate of Research and Planning of Water Resources. Today, it is an essential element in the management of dams since the problem of siltation of reservoirs (and their problems such as eutrophication) gradually lowers the capacity of stockage. This now covers most large structures most of which date back to more than 20 years.

6.4. CitizenComplaints

Public information is generally provided by the publication of information leaflets and radio and television campaigns. Studies are madeby the departments responsible for the enforcement of laws that guide their actions.

7. Credible evidence for the Indictment of Violators

Evidence admitted are essentially those contained in or resulting from inspection reports (notes, conversations and collected samples)

7.1 Sampling and Analysis:

The quality criteria for evidence of non-compliance with laws are based on the precision, accuracy and reproducibility of the analytical methods, the sensitivity and detection limit of the analytical methods, the reliability of sampling and measuring instruments, etc.., quality assurance and quality control.

7.2 Implementation of a Flawless Chain of Custody

Most laboratories are certified (ISO, etc.). All details listed are required as part of the inter-laboratory calibration measures (procedure is under formalization as part of the implementing directive on the approval of laboratories which is currently under discussion prior to being submitted to Parliament).

7.3 Reporting andDocumentation

Most laboratories are certified (ISO, etc.). All details listed are required as part of the inter-laboratory calibration measures (procedure is under formalization as part of the implementing directive on the approval of laboratories which is currently under discussion prior to being submitted to Parliament).

8. Overall Assessment – compliance with water/environmental legislation

The main challenges and the main constraints to be addressed in order to improve compliance with the legislation on water and the environment relate to the effective assumption of responsibilities by role players (including the Water Police and environmental inspectors), the lack of awareness on water and environment issues, the economic cost to comply with the regulations on water and the environment, the lack of cross-coordination of the authorities responsible for the implementation of regulations and the weakness of the judicial system, including judges for acts of non-compliance in the areas of water and the environment.

At the dawn of 21st century, Morocco enjoys strong technical expertise in the management of its water resources and infrastructure and the capacity to mobilize these resources, as compared to neighboring countries or countries of the same level of economic development.

The adoption of new regulations on water and the environment thereof is a qualitative leap which, besides the introduction of new laws, has initiated a major institutional reform that has radically changed the sector layout and fully redistributed roles and responsibilities among stakeholders.

8.1 Level of compliance with water/ environmental legislation

One of the fundamental aspects of the legislative and institutional reform experienced in the water sector in Morocco is that this reform was performed in a smooth and consensual manner.

As a result:

- The impact of regulatory measures imposed has been reduced to the minimum acceptable by all parties (low fines, retaliation is not likely to disturb public order or cause tensions or any economic, social or security consequences)
- The redistribution of responsibilities among stakeholders was enacted but was applied gradually, when the parties were convinced of its merits and integrated the means to exercise them
- The reform process was initiated early (it could be said to have started on the date of the first meeting of the Supreme Council for Water and Climate in 1981) and has spread over a long period (from 1995 to the present day, but not yet fully completed), allowing enough time to break in, to settle and get implemented very gradually.
- The above considerations explain why, in our opinion, the questionnaires reflect significantly different opinions depending on whether the Ministry of Energy, Mines, Water and the Environment or other stakeholders of the sector (the latter with operational issues that cause them to become impatient and feel a sense of immobility facing the caution and slow pace adopted by the Ministry responsible for the implementation of the reform).

8.2 Main challenges, gaps and constraints towards improved compliance

In the current situation, conflicts persist between stakeholders for the redistribution of functions, including security matters (police water functions) and standardization. These conflicts greatly slow down the process of issuing enforcement guidelines for laws and the formulation of required standards. These will not be overcome unless the Ministry of Energy, Mines, Water and the

Environment gains legitimacy in its role as legislator, controller and regulator (which requires benchmarking with other experiences to ensure the quality of texts to enact, training of officers and eventual recruitment of additional human resources to benefit from skills and resources necessary).

The control of law enforcement is now only partially exercised. The reasons are many:

- Only health consequences and matters of disturbing public order are currently universally recognized as applying to motivate stringent laws for the protection of water resources and the environment.
- Controls relating to verification of heritage and private property are still exclusively the prerogative of the Department of the Interior, the Royal Mounted Police, the Royal Armed Forces and ancillary bodies in charge of tax collection.
- Therefore, the water police does not have full authority to exercise control. In addition, it only has very limited human and material resources to exercise this control.
- A change in this state of affairs requires either that the mandate and human and material resources be clearly attributed to the former by the State to exercise such control without limitations, or that it can effectively delegate this control to entities that already have a mandate for exercising them.
- In this case, these entities will benefit from additional resources, training for the benefit of agents and possibly organizational measures enabling them to take on this assignment.