Swiss Confederation

Federal Departement of Economic Affairs,
Education and Research EAER
State Secretariat for Economic Affairs SECO

Holding Company for Water and Wastewater

eawag aquatic research

Scaling-up small-scale sanitation in a disabling institutional and regulatory environment:

Experiences from Egypt

Egyptian-Swiss Research for Innovations in Sustainable Sanitation (ESRISS)

BORDA Symposium, Bremen, 11.11.2015

Philippe Reymond, Eawag-Sandec

philippe.reymond@eawag.ch

www.sandec.ch/esriss

Eawag: Swiss Federal Institute of Aquatic Science and Technology

Context

85% of the rural areas in Egypt without WW treatment

⇒ about 4,700 villages and **30,000 scattered settlements**

Main goal of the ESRISS Project:

Development of a **wide-scale replicable model**

for small-scale sanitation in the Nile Delta

Small-scale: < 5,000 cap.

COST-EFFECTIVENESS

CONTEXT-APPROPRIATENESS

ESRISS' three main components

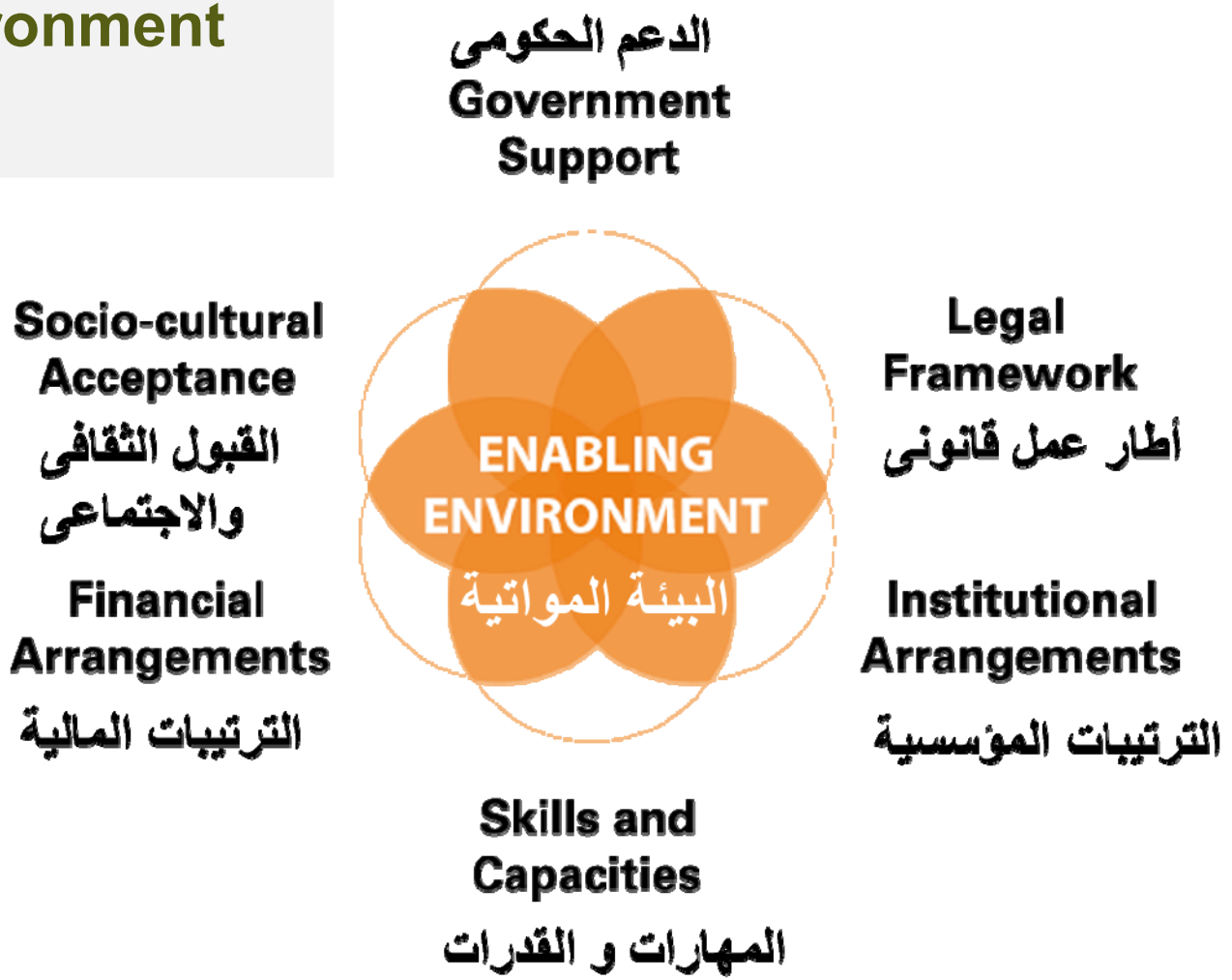
A Assessment of **challenges and success factors** of past small-scale sanitation initiatives in Egypt

B Development of a **data baseline** and a model-based **planning tool** to estimate wastewater characteristics

C **Policy recommendations**

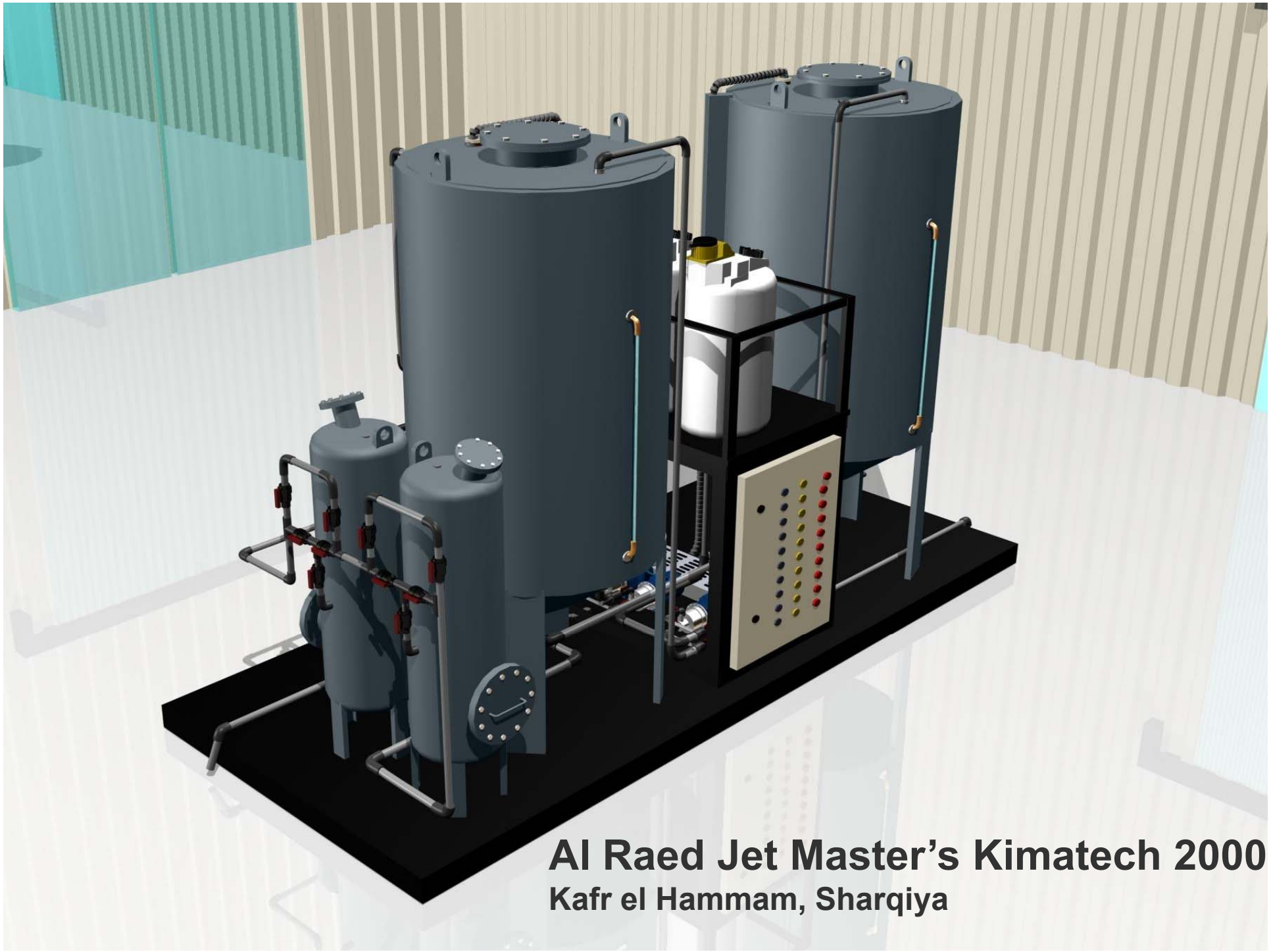
ESRISS methodology

Systematic assessment using the **Enabling Environment Framework**



Swiss Confederation
Federal Department of Economic Affairs FDEA
State Secretariat for Economic Affairs SECO

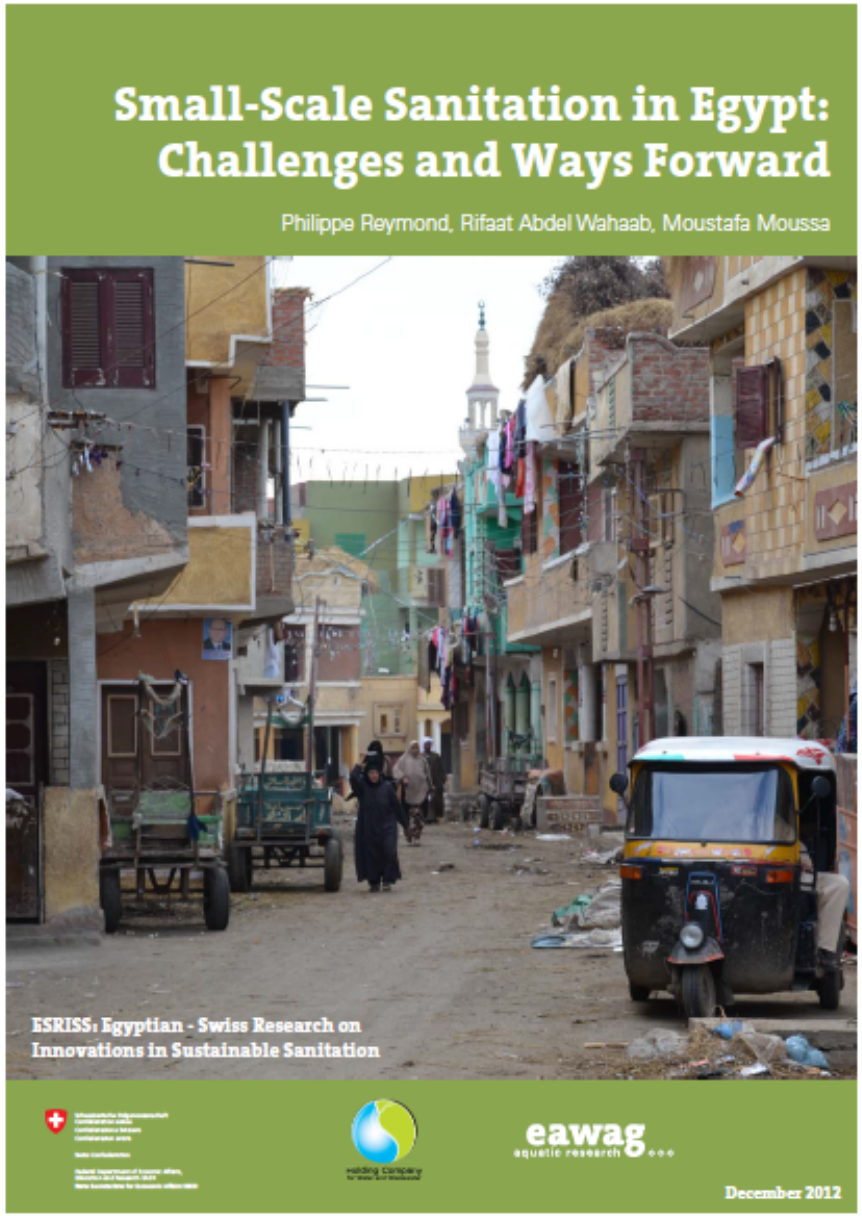

Anaerobic Baffled Reactor
+ Anaerobic Filter ("USBR")
Abdel Kareem Issa, Fayoum

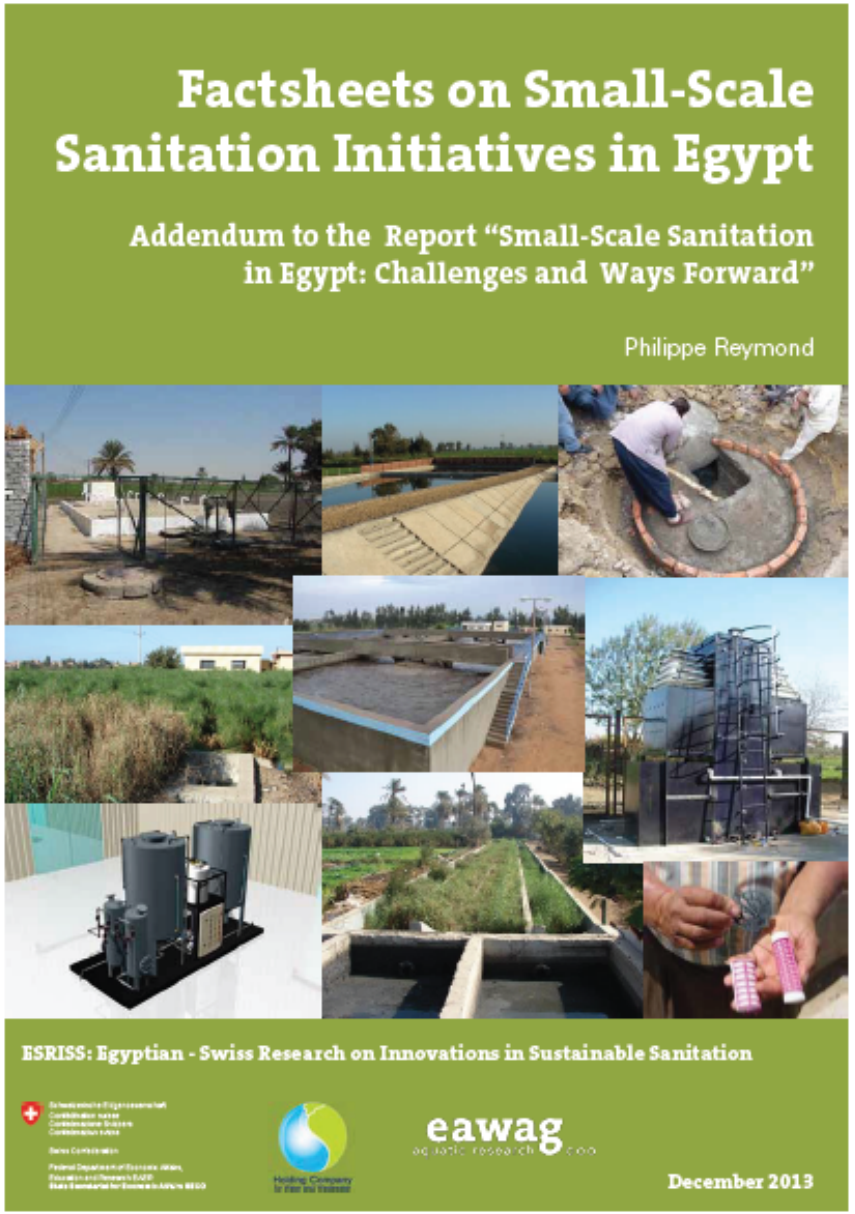


Al Raed Jet Master's Kimatech 2000

Kafr el Hammam, Sharqiya


Household Biogas Digesters
Upper Egypt and Fayoum


Small-Scale Sanitation in Egypt:
Challenges and Ways Forward
Philippe Reymond, Rifaat Abdel Wahaab, Moustafa Moussa
ESRISS: Egyptian - Swiss Research on
Innovations in Sustainable Sanitation
eawag
aquatic research
December 2012


Factsheets on Small-Scale
Sanitation Initiatives in Egypt
Addendum to the Report "Small-Scale Sanitation
in Egypt: Challenges and Ways Forward"
Philippe Reymond
ESRISS: Egyptian - Swiss Research on Innovations in Sustainable Sanitation
eawag
aquatic research
December 2013

research for policy

Cairo, 30 September 2012

"Small-Scale Sanitation in Egypt"

10 POINTS to move forward

Authors

Philippe Reymond, Eawag/Sandec
Dr. Rifaat Abdel Wahaab, HCWW
Dr. Moustafa Moussa

The ultimate goal of the ESRISS Project is the development of a wide-scale replicable model for small-scale sanitation in the Nile Delta. By "small-scale" we refer to "settlements or groups of settlements of up to 5,000 inhabitants". In our approach, the whole sanitation system, including management schemes, is considered. Cost-effectiveness and context-appropriateness are key targets. This document synthesises the main findings detailed in the ESRISS report entitled "Small-scale sanitation in Egypt: challenges and ways forward".

The 10 Points:

1. Development of a clear institutional strategy
2. Standardisation of treatment units
3. Centralised O&M management under the leadership of HCWW
4. Selection of appropriate collection & treatment options
5. Adaptation of laws and regulations
6. Move beyond "business as usual"
7. Development of a data baseline
8. Focus on preliminary assessment
9. Improvement of the project management cycle
10. Transparency and dissemination of lessons learnt

ESRISS Project

القاهرة فبراير ٢٠١٣

"الصرف الصحي في المجتمعات الريفية الصغيرة في مصر"

١٠ نقاط للمضي قدما

المؤلفون

م. فيليب ريمون
المعهد السويسري للعلوم و التكنولوجيا المائية
philippe.reymond@eawag.ch (Eawag/Sandec)

أ.د. رفعت عبد الوهاب
الشركة القابضة لمياه الشرب والصرف الصحي
rawahaab@yahoo.com (HCWW)

د. مصطفى موسى
كلية الهندسة - جامعة حلوان
m.moussa@delft-environment.net

وتتلخص العشر نقاط الرئيسة في الآتي:

١. وضع استراتيجية مؤسسية واضحة
٢. التوحيد القياسي لوحدات المعالجة
٣. الإدارة المركزية للتشغيل والصيانة تحت قيادة الشركة القابضة لمياه الشرب والصرف الصحي
٤. اختيار نظم معالجة مناسبة من بين العديد من الخيارات المتاحة
٥. تهيئة القوانين واللوائح المنظمة
٦. تجاوز سيناريو "بقاء الأمور على حالها"
٧. تنمية البيانات الأساسية
٨. التركيز على التقييمات الأولية
٩. تحسين إدارة المشروع
١٠. الشفافية ونشر الدروس المستفادة

إن الهدف الأساسي للمشروع ESRISS هو تطوير نموذج قابل للتكرار على نطاق واسع للصرف الصحي في المجتمعات الريفية الصغيرة في منطقة دلتا النيل، وعندما نقول

Policy brief: 10 POINTS to move forward

THE CRITICAL ISSUE IS INSTITUTIONAL AND MANAGERIAL, NOT TECHNICAL

Swiss Confederation

Federal Departement of Economic Affairs, Education and Research EAER
State Secretariat for Economic Affairs SECO

What is a disabling institutional environment ?

- No clear responsibility for rural sanitation and lack of vision
- No constructive collaboration between the Utility (HCWW), the Ministry of Water Resources and Irrigation (MWRI) and the Ministry of Health (MoH)
- Lack of faith in small-scale system at the Utility
- Lack of experience in the Utility and in the local private sector
- Management tradition of overstaffing with underskilled people
- Reluctance to increase fees and weak fee recovery

What is a disabling regulatory environment ?

- Effluent standards are not adapted for rural sanitation

  ⇒ *Too stringent («all or nothing philosophy»)*

  ⇒ *In particular COD, DO and pathogens are an issue*

  ⇒ *Not linked to the quality of receiving water bodies*

Standards	Egypt	Morocco	Jordan	EU
COD (mg/L)	80	250	150 / 300*	125
BOD (mg/L)	60	120	60	25
TSS (mg/L)	50	150	60 / 120*	35

** For biological treatment plants or treatment plants with polishing ponds*

What is a disabling regulatory environment ?

- No regulation protecting communities and private sector for the management of all or part of the sanitation system

- Planning and design standards currently are hindering factors

  ⇒ *No Code of Practice with alternative systems*

- e.g. the pragmatic use of small drains should be approved by MWRI

ESRISS' three main components

A Assessment of **challenges and success factors** of past small-scale sanitation initiatives in Egypt

B Development of a **data baseline** and a model-based **planning tool** to estimate wastewater characteristics

C **Policy recommendations**

Swiss Confederation

Federal Departement of Economic Affairs, Education and Research EAER
State Secretariat for Economic Affairs SECO

No more pilots !

General saying: *“Pilots never fail, pilots never scale…”*

⇒ **Think at scale** !

⇒ Pilots need to be realised **AT SCALE** !

⇒ Allow **piloting of management schemes** with **critical mass** of projects and centralised management

⇒ Pilot **economies of scale** both **at implementation and management level**

⇒ Focus on an **increased cost-effectiveness**

Ways forward

- Start to think **from the supply side / business** perspective

- Think in terms of **economies of scale** and **critical mass**

  ⇒ *Standardisation of the units and the management*

- Show the **potential for the private sector** and in terms of job creation

  ⇒ *Small scale sanitation is a **new market** !*

- **Know-how** transfer for prefabricated systems, **capacity-building**

- Advocating for awareness at the top level of the State

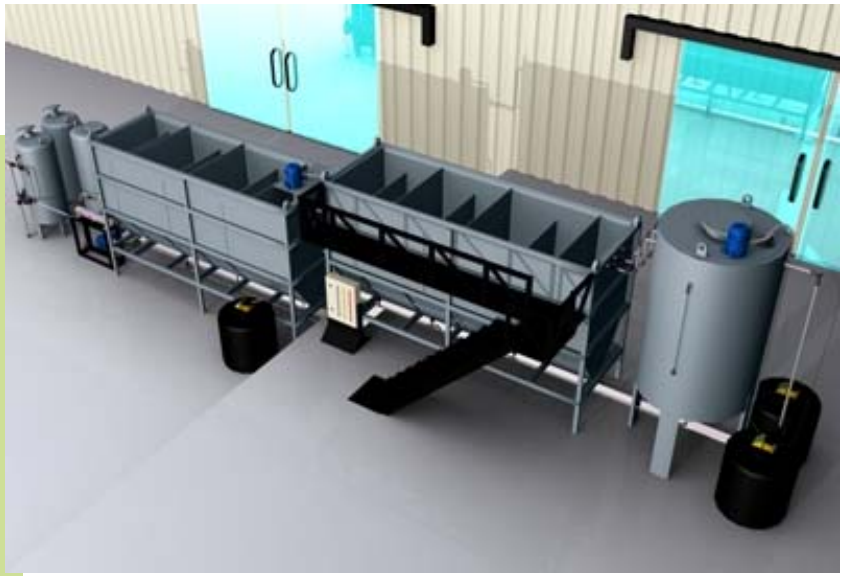
  ⇒ ***Aiming for a national policy***

⇒ **Trying to reform regulations one-by-one does not work in Egypt.**

⇒ **Only a decision from the top can lead to quick change**

Standardisation of collection & treatment units

⇒ Explore the concept of locally produced **prefabricated units**



Benefits:

- **Quality** under control
- No price negotiation every time
- Costs under control
- **Time saving** in construction process
- Opening of a **promising market**
- **Modularity** and **flexibility**

Involvement of the private sector

An observation…

Small-scale sanitation in Egypt functions very well in touristic resorts but not in small rural villages.

⇒ Management issue

⇒ Guarantee issue

⇒ Cost-recovery issue

⇒ Regulatory issue

Involvement of the private sector

LESSONS LEARNT	RECOMMENDATIONS / WAYS FORWARD
Involvement of the private sector:	
• The private sector seems to be **mainly playing against** small-scale sanitation: ➢ high resistance to innovation, ➢ lack of know-how in that field, ➢ huge overheads, ➢ poor construction quality ➢ very long implementation time.	• Encourage **design-build-operate** mechanisms • Investigate potential **business models**. • **Encourage local prefabrication** of components • **Train local engineers and masons** at governorate-level.

Involvement of the private sector

The role of the private sector would be two-fold:

1. **Designing, build and monitor monthly** the small-scale sanitation systems.

2. **Manufacture prefabricated components** of the sanitation systems (treatment modules, manholes, etc.)

Open questions:

- At which level/scale can such companies be viable?
- Potential business models?
- Necessary legal & regulatory framework?

⇒ **Small-scale sanitation is a new market in Egypt**

Role of the institutions

How to encourage the private sector and get it right ?

1. **Licensing** ?
2. Certification ?
3. **Fostering joint ventures** with international companies ?
4. Mechanism **guaranteeing cost recovery?**

⇒ **Would this be the role of a centralised management unit or specific department within the Utility?**

Increase cost-effectiveness

- Think in terms of **economies of scale** and **critical mass**

  ⇒ *Standardisation of the units and the management*

- **Modularity and phased implementation**:
  - *Reduce idle capacity*
  - *Limited planning horizon (max. 15 years)*

- Determine the **management and financial arrangements BEFORE** the final technology selection

Management schemes

Management schemes

LESSONS LEARNT	RECOMMENDATIONS / WAYS FORWARD
Management schemes:	
• **Isolated technology** pilots fail. • **Human resources** required is a concern for the institutions	• **Decentralised sanitation systems require a centralised management.** • Need for a dedicated structure, with professionals specifically trained, in order to **concentrate the skills**. • **Partial delegation** to the communities

Centralised management unit

What is needed is the trial of a large-scale management scheme.

- **Interface** between the institutions, the private sector and the communities.

The three main questions to be answered are:

- ✓ How to start?
- ✓ What should be the status of such a unit and where should it be embedded ?
- ✓ What is the setup that would best be able to encourage the private sector ?

Centralised management unit

Two Scenarios

a. Incremental approach: start at local level, in a defined area

- *approach of "strategic niche management", e.g. As Salam Canal area*

b. Implement it directly as a national strategy and operate institutional changes

- *in that case, a Special Status Unit*

Open question: scale of the centralised management unit(s) ?

Moreover…

- Increase the credibility of small-scale systems

  ⇒ *Lower the risk of failure*

- Improve project planning

  ⇒ *Provide local consultants with tools which help them get:*

  1. Relevant assessment of the initial situation
  2. Good data analysis
  3. Estimation of design parameters on a context-specific basis

- Understand better the quantity and characteristics of the wastewater to treat; **village-specific design criteria**

⇒ **Facilitate local Utility and consultants to take up small-scale sanitation with a minimal risk**

Improve design parameters

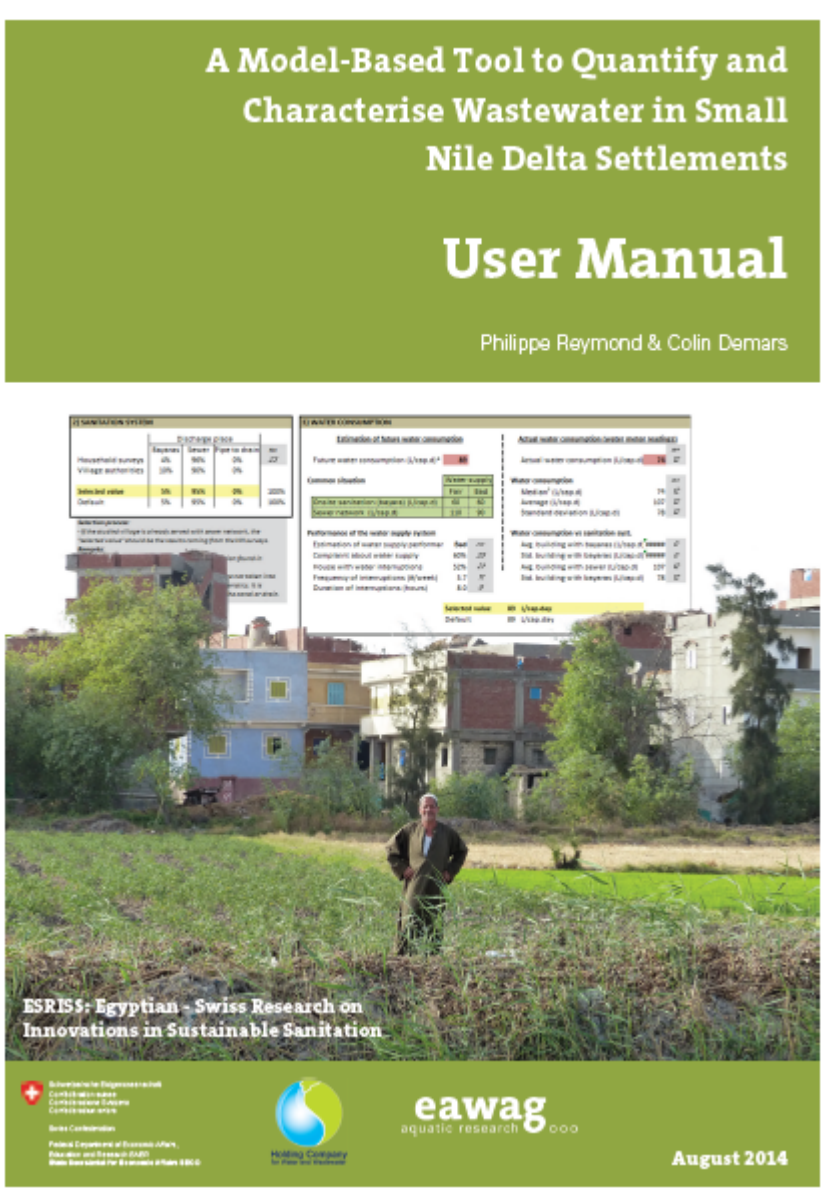
⇒ ***Small villages, ezbas, are very heterogeneous***

Parameters	Range [mg/L]
BOD	200 – 1000
COD	400 – 2500

Main result for the practitioners:

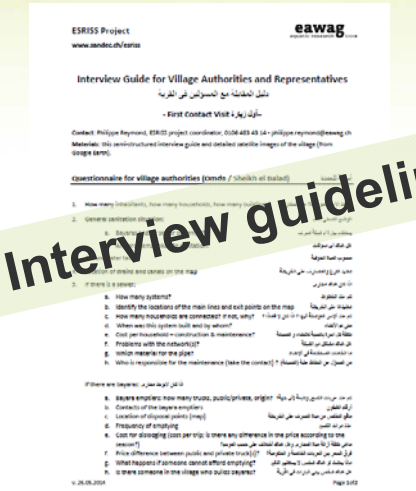
A tool to estimate wastewater quantity and characteristics

Design Parameters



A Tool Package

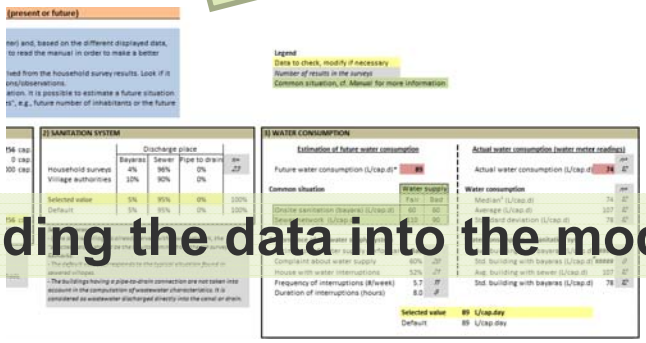
Model estimation		Daily average		Morning peak	
Parameter	Unit	Conc.	Precision	Fact.	Conc.
Flow	m3/day	290	20%	1.6	460
Flow	L/min	200	20%	1.6	320
COD	mg/L	1390	30%	1.3	1810
BOD[1]	mg/L	710	30%	1.2	850
TS[2]	mg/L	3040	30%	1.5	4560
TSS	mg/L	410	30%	1.4	570
TN	mg/L	230	30%	1.4	320
TP	mg/L	13	30%	1.4	19



Interview guideline

TOTAL: MAX. 3 WORKING DAYS

Household survey questionnaire



Feeding the data into the model

Standards

Standards

LESSONS LEARNT	RECOMMENDATIONS / WAYS FORWARD
Standards:	
• **"Everything or nothing"** philosophy • COD value (80 mg/L) as a main limiting factor	• **Incremental implementation of the law 48/1982 effluent standards - moratorium** • **Adapted Codes of Practice** • With **advanced primary treatment only**, the pollution load would already be cut of at least **60%**. • A solution is possible with **clear responsibilities**.

Involvement of the communities

Involvement of the communities

LESSONS LEARNT	RECOMMENDATIONS / WAYS FORWARD
Involvement of the communities:	
• Communities mainly interested in **getting rid of the wastewater**. • Sustainable cost recovery requires the people served by small-scale systems to **pay more than official tariff**. • People in the unserved villages currently **pay sometimes 20x more** than those served by governmental systems. • Villagers **pay often more than the official tariff**.	• **There is a capacity to pay**: paying a fee covering O&M would be cheaper than what is currently paid. • **Bundle several services** together, e.g. sanitation and solid waste. • **Beneficial enduses** as an incentive. • **Technical support** to the communities willing to pay for a sewer system.

Conclusions

Dealing with a disabling environment

⇒ **Think at scale** !

⇒ **Critical mass** and **centralised management**

⇒ Pilot **economies of scale** both **at implementation and management level**

⇒ **Convince** through **business potential**

⇒ **Facilitate the work** of consultants and contractors

⇒ **Incremental implementation** of disabling effluent **standards**

⇒ *Create new **drivers of change***

philippe.reymond@eawag.ch

eawag
aquatic research

Swiss Confederation

Federal Departement of Economic Affairs,
Education and Research EAER
State Secretariat for Economic Affairs SECO

WWW.SANDEC.CH/ESRISS

Holding Company
for Water and Wastewater