Swiss Confederation

Federal Departement of Economic Affairs,
Education and Research EAER
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Holding Company for Water and Wastewater

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Scaling Up Small-Scale Sanitation in Egypt

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

Regional Conference on "*Sustainable Integrated Wastewater Treatment and Reuse*", Sharm El Sheikh, 1-2 December 2014

Philippe Reymond,

Rifaat Abdel Wahaab, Moustafa Moussa

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Eawag: Swiss Federal Institute of Aquatic Science and Technology

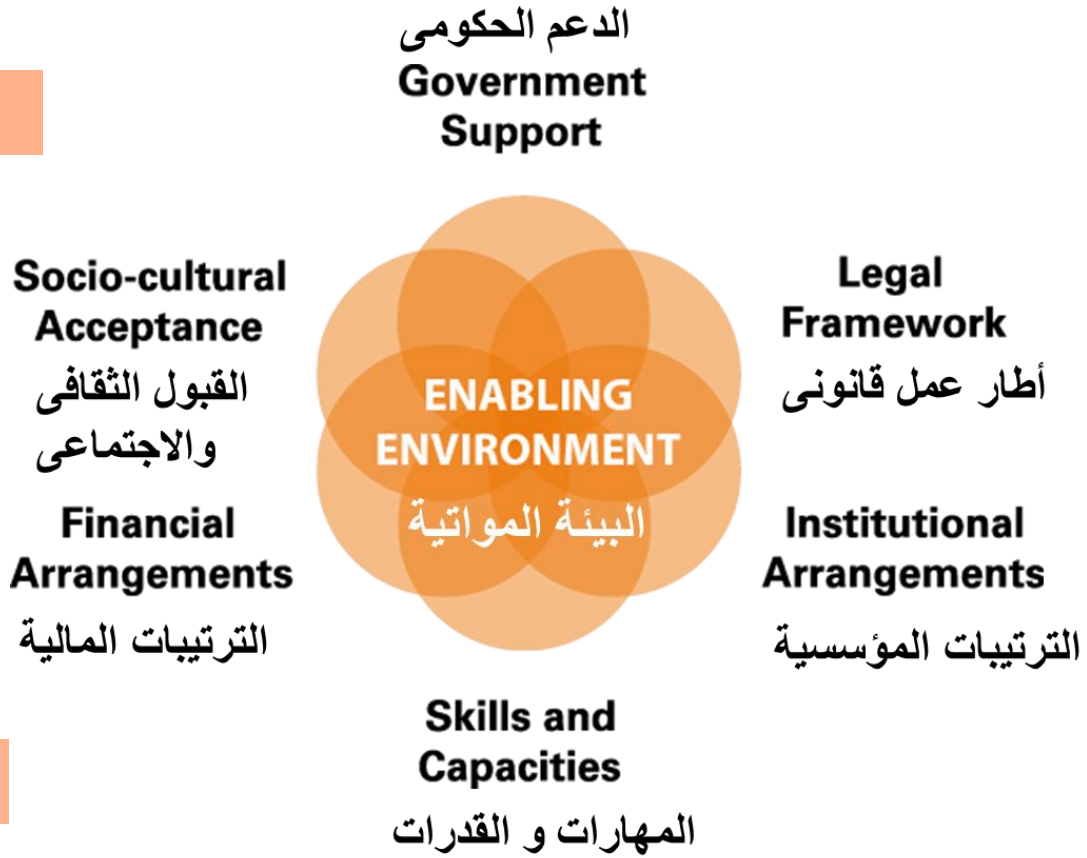
ESRISS' scope & methodology

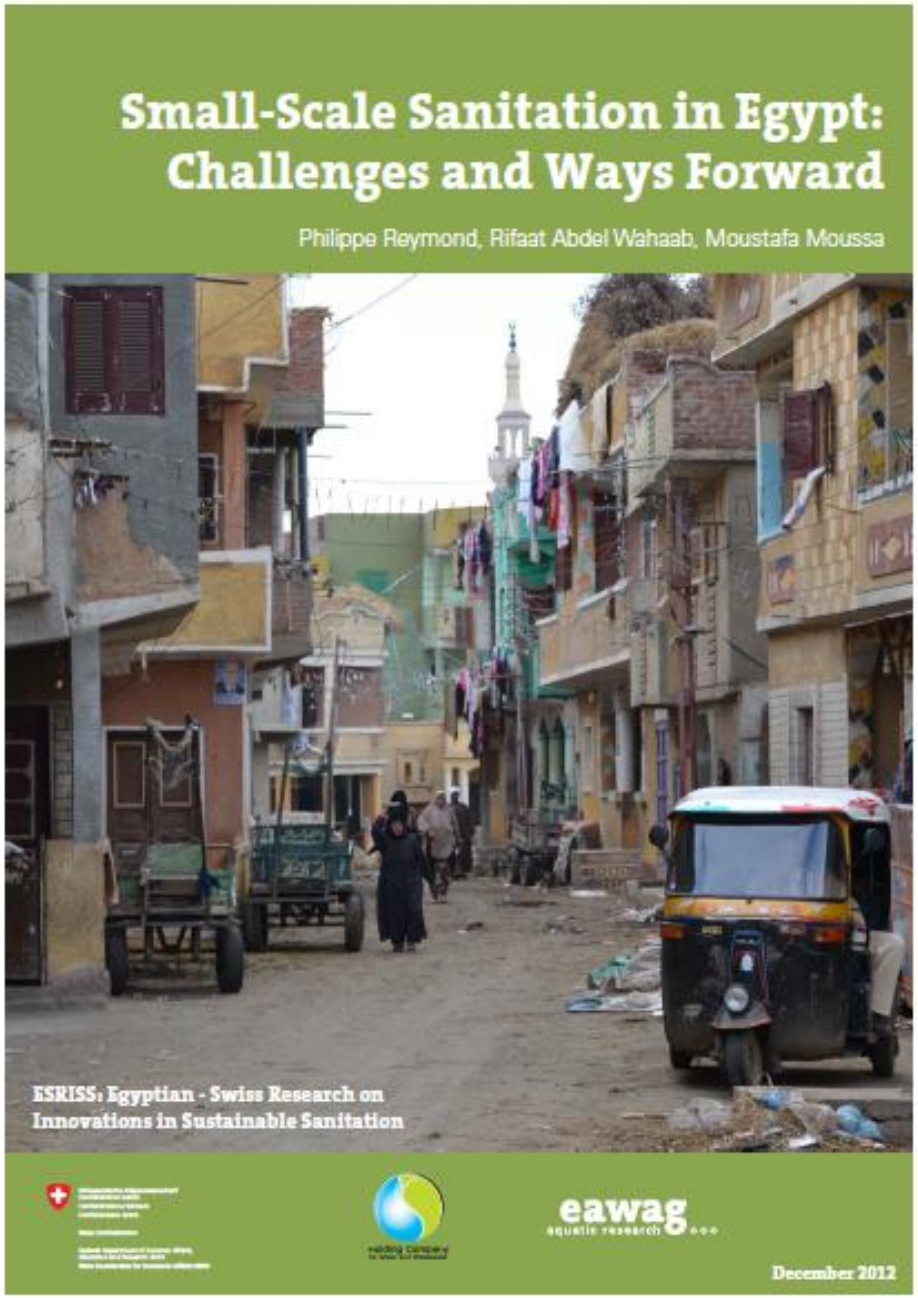
Development of a **wide-scale replicable model** for small-scale sanitation in the Nile Delta

Small-scale: < 5,000 cap.

COST-EFFECTIVE

CONTEXT-SPECIFIC




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
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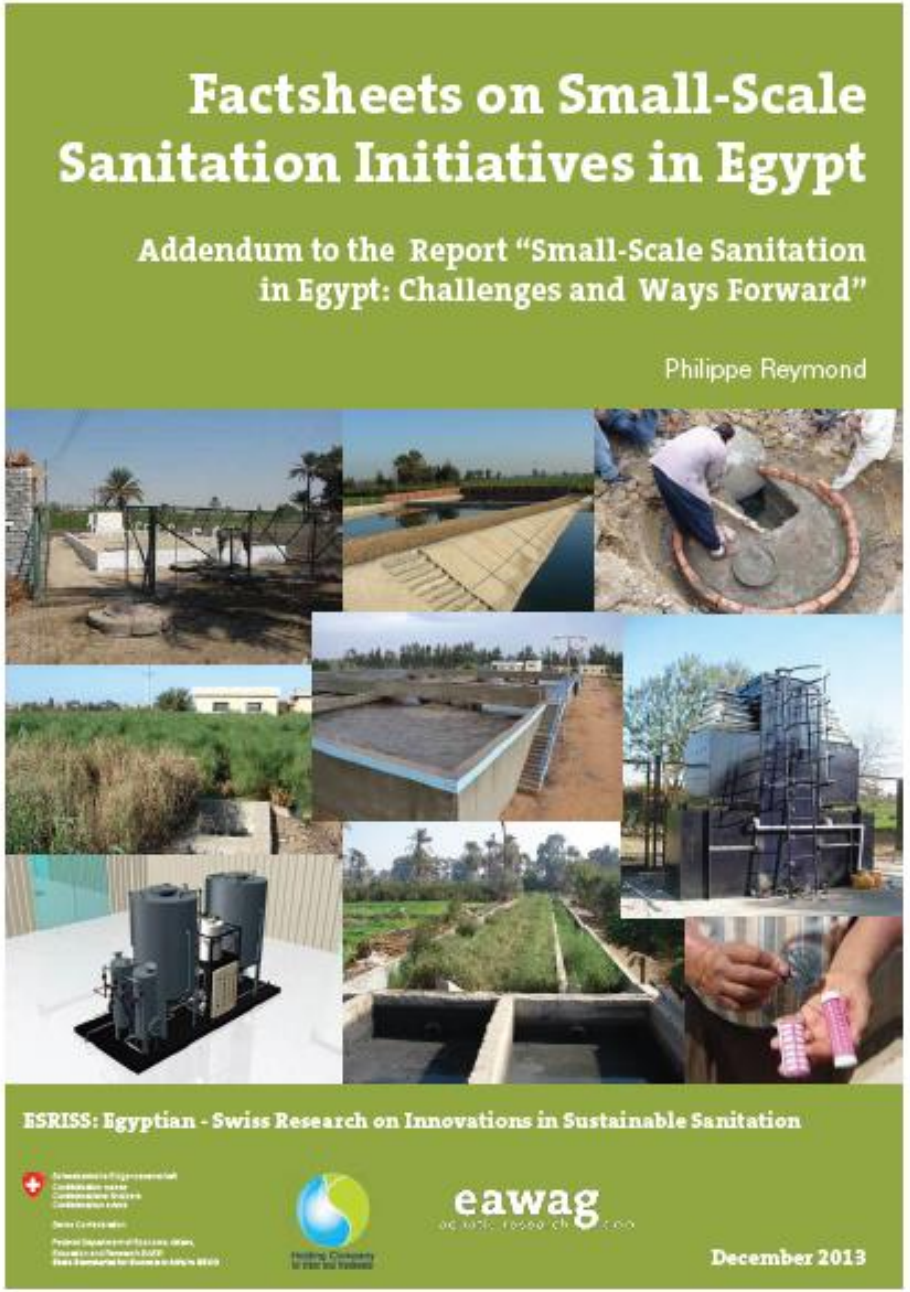
December 2012


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
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December 2013

Policy brief: 10 POINTS to move forward

THE CRITICAL ISSUE IS MANAGERIAL, NOT TECHNICAL

1. **Site-specific and participatory preliminary assessment**
2. **Viable management & financial arrangements**
3. **Search for economies of scale**

Priority is to work on the conditions

which will enable small-scale sanitation

Small-Scale Sanitation in the Nile Delta:

Baseline Data and Current Practices

Philippe Reymond, Colin Demars, Anastasia Papangelou,
Mohamed Hassan Tawfik, Kareem Hassan, Rifaat Abdel Wahaab, Moustafa Moussa

ESRIS5: Egyptian - Swiss Research on Innovations in Sustainable Sanitation

2nd edition, incl. more data and a summary in Arabic

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August 2014

Modelling Small-Scale Sanitation in the Nile Delta:

A Material Flow Analysis with Nutrient Reuse Perspective

Philippe Reymond, Colin Demars, Anastasia Papangelou,
Mohamed Hassan Tawfik, Lukas Ulrich, Rifaat Abdel Wahaab

ESRIS5: Egyptian - Swiss Research on Innovations in Sustainable Sanitation

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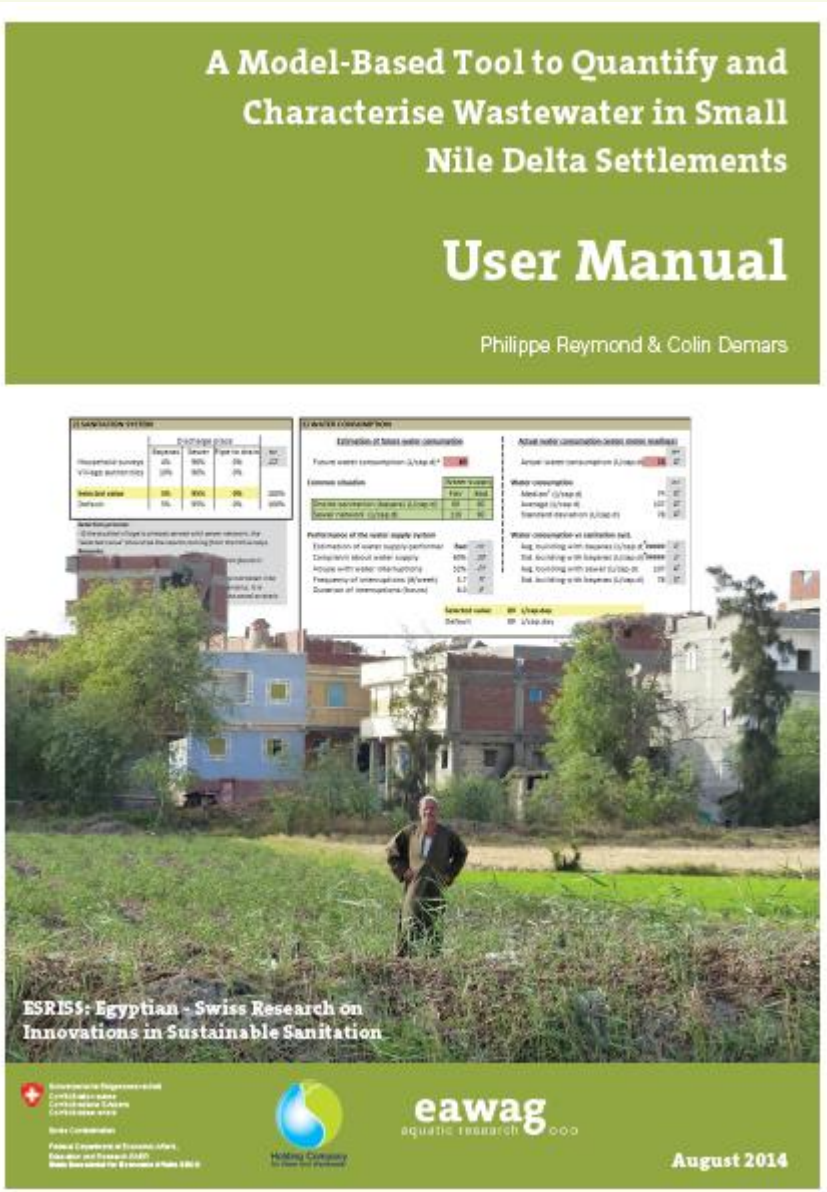
August 2014

Main result for the practitioners:

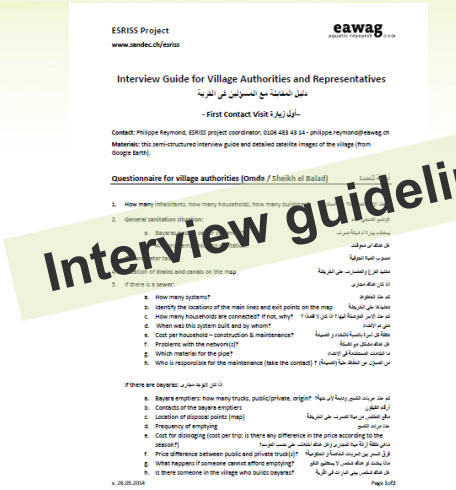
A tool to estimate wastewater quantity and characteristics

Design Parameters



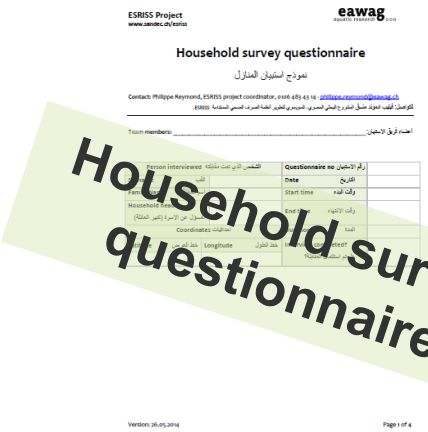
A Tool Package

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

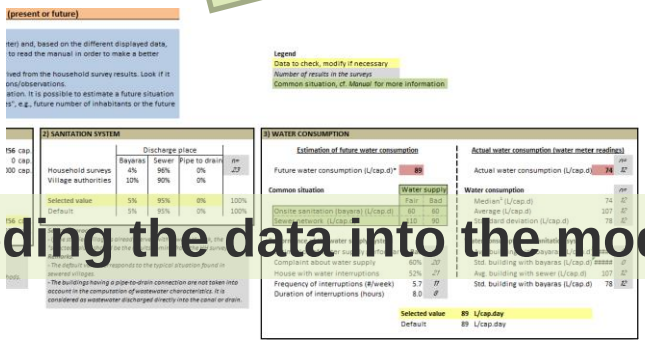


Interview guideline

TOTAL: MAX. 3 WORKING DAYS



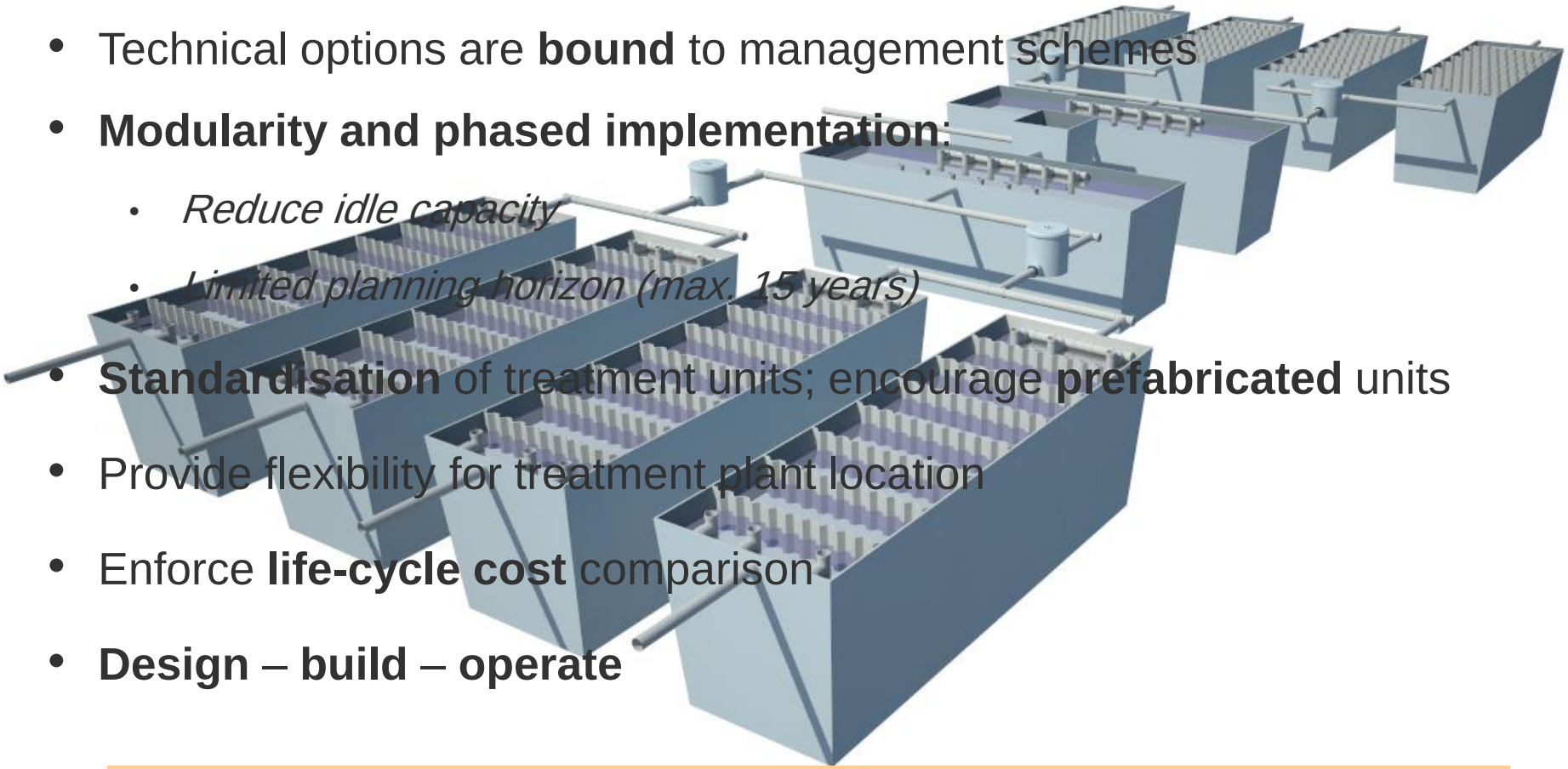
Household survey questionnaire



Feeding the data into the model

Increasing cost-effectiveness and sustainability

- Think in terms of **economies of scale** and **critical mass**
- Technical options are **bound** to management schemes
- **Modularity and phased implementation**:
  - *Reduce idle capacity*
  - *Limited planning horizon (max. 15 years)*
- **Standardisation** of treatment units; encourage **prefabricated** units
- Provide flexibility for treatment plant location
- Enforce **life-cycle cost** comparison
- **Design – build – operate**



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

Recommendations for an enabling environment

LEGAL FRAMEWORK

- Incremental implementation of the effluent standards
- Differentiated standards for small communities (e.g. like in EU)
- Code of Practice for small-scale sanitation

INSTITUTIONAL ARRANGEMENTS

- Necessity of a better coordination and collaboration between governmental institutions (HCWW, NOPWASD, MWRI, MoH)
- An **agreement with MWRI** is key.
  - ⇒ *MWRI intends to encourage the reuse of water from small drains*
  - ⇒ *Small drains are the node and the core of the solution, as point of discharge and potential part of the treatment system*
  - ⇒ **Solution possible with *CLEAR* responsibilities**

MANAGEMENT AND FINANCIAL ARRANGEMENTS

- Currently, the Subsidiary Companies **do not have the capacity** to manage small-scale systems

- Small-scale sanitation **requires specific skills**

  ⇒ *Need for a **dedicated structure**, with professionals specifically trained*

  ⇒ *Concentrate the skills*

  ⇒ ***Centralised management of decentralised units***

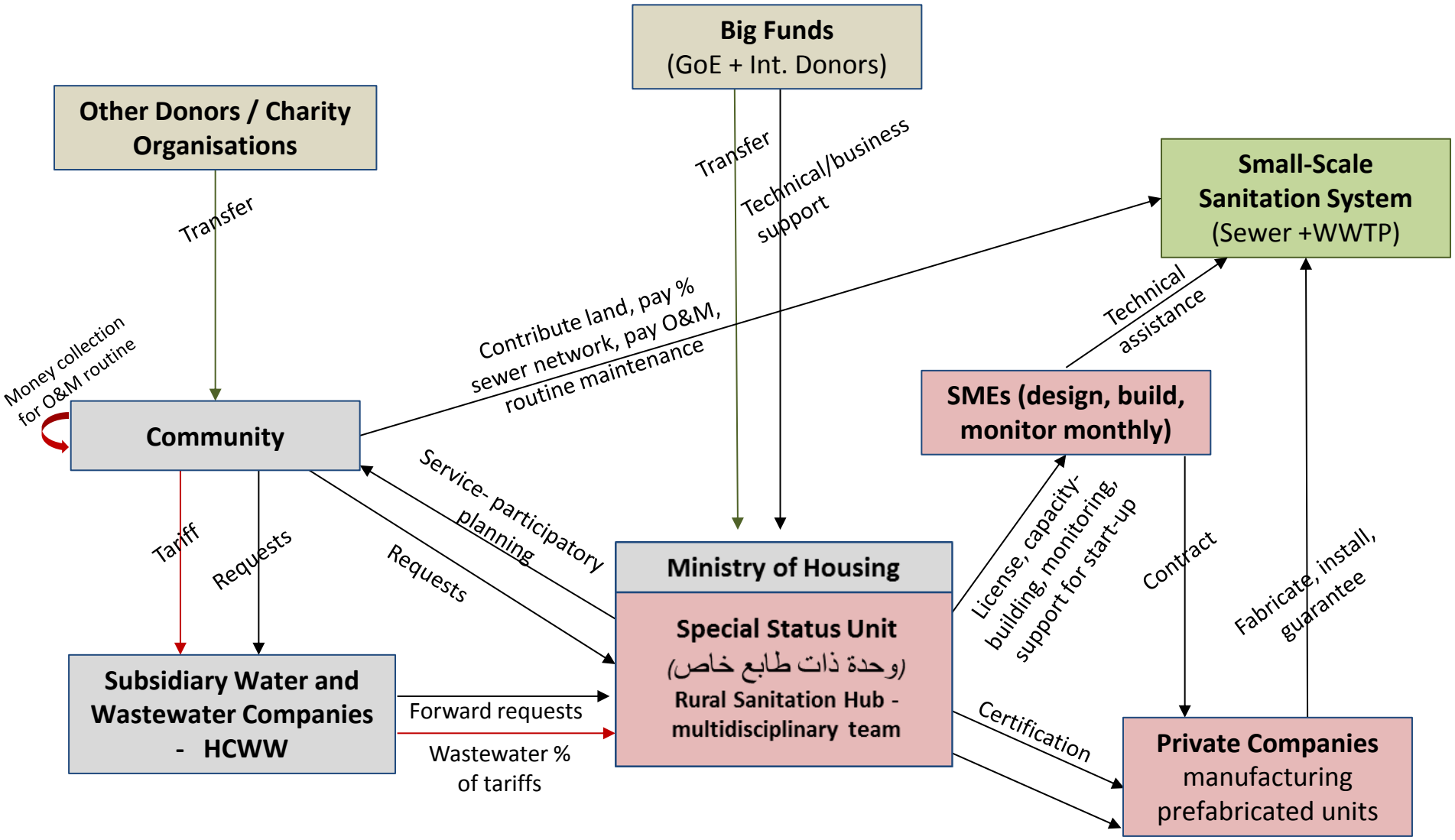
- **Enable the private sector and communities** to take an active role

  ⇒ *Examples: Operation of small-scale systems ; Prefabrication*

  ⇒ ***Create market niches, job opportunities***

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

Potential management and financial schemes



Current activities and perspectives

- **Policy paper** and inputs in the **rural sanitation strategy**, with HCWW and GIZ
- Discussion of **management and financial arrangements** at policy level
- **Capacity-building workshops** in HCWW
- Realisation of a **video** about rural sanitation in the Nile Delta
- **Application of the tool** to estimate wastewater quantities and characteristics

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- External links

ESRISS Documents & News

- ESRISS Planning Tool ***NEW***
- ESRISS Picture Gallery ***NEW***
- Baseline Data Report - 2nd ed. ***NEW***
- MFA Report ***NEW***
- Article Sandec News 2014 ***NEW***
- ESRISS 10 Points Policy Paper in Arabic
- ESRISS 10 Points Policy Paper

Water and Sanitation in Developing Countries

Egyptian-Swiss Research on Innovations in Sustainable Sanitation: ESRISS

ESRISS is a Swiss State Secretariat for Economic Affairs (SECO) funded research project at Sandec that deals with the sanitation planning gap in Nile Delta villages which cannot be connected to large centralised treatment plants. The five-year research project (Mai 2010 - April 2015), in partnership with the Egyptian Holding Company for Water and Wastewater (HCWW), aims at developing decision-making tools and strategies for the wide-scale replication of small-scale sanitation systems. As a parallel research component of the Integrated Sanitation & Sewerage Infrastructure Project (ISSIP), launched by the Government of Egypt in cooperation with the World Bank, it complements the establishment of centralised treatment plants in three Governorates of the Nile Delta region. ESRISS is coordinated by Philippe Reymond, who is based in Cairo.

The objective of ESRISS is to address the following research questions:

- What are the challenges and success factors of past decentralised sanitation approaches in the Egyptian context, and why?
- What technologies and/or combinations of technologies are the most appropriate for the Nile Delta region given the land use, water or wastewater usage and local environmental factors, and how do these affect nutrient recycling and resource recovery?
- What key features in the enabling environment are necessary to scale up small-scale sanitation in the Nile Delta? What are the ways forward?
- How economically viable is a decentralised treatment system compared to a traditional centralised system in terms of capital, operation and maintenance costs?

The outcomes of the ESRISS project so far can be divided into the five following thematics:

- Small-scale sanitation challenges and ways forw
- Baseline data and current practices in the Nile D
- Planning tool to estimate wastewater quantity and
- Material flow analysis and comparison of scenari
- Financial analysis of sanitation in the Nile Delta [upcoming]

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THANKS FOR YOUR ATTENTION !

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