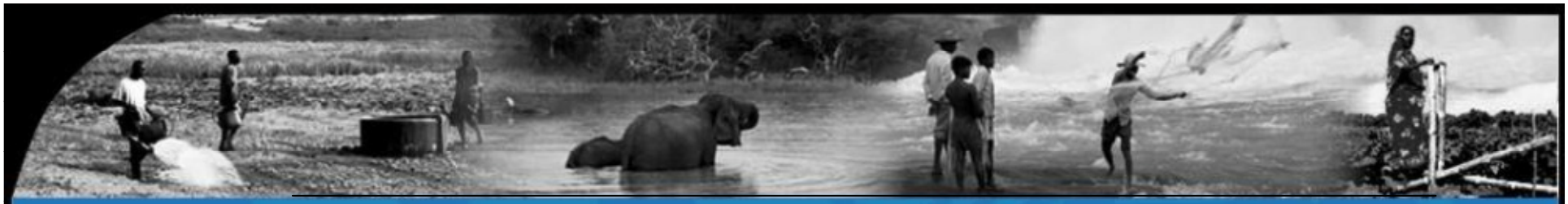

"Reality, drivers and potential (challenges?) of wastewater reuse in urban and peri-urban agriculture"

Liqa Raschid-Sally
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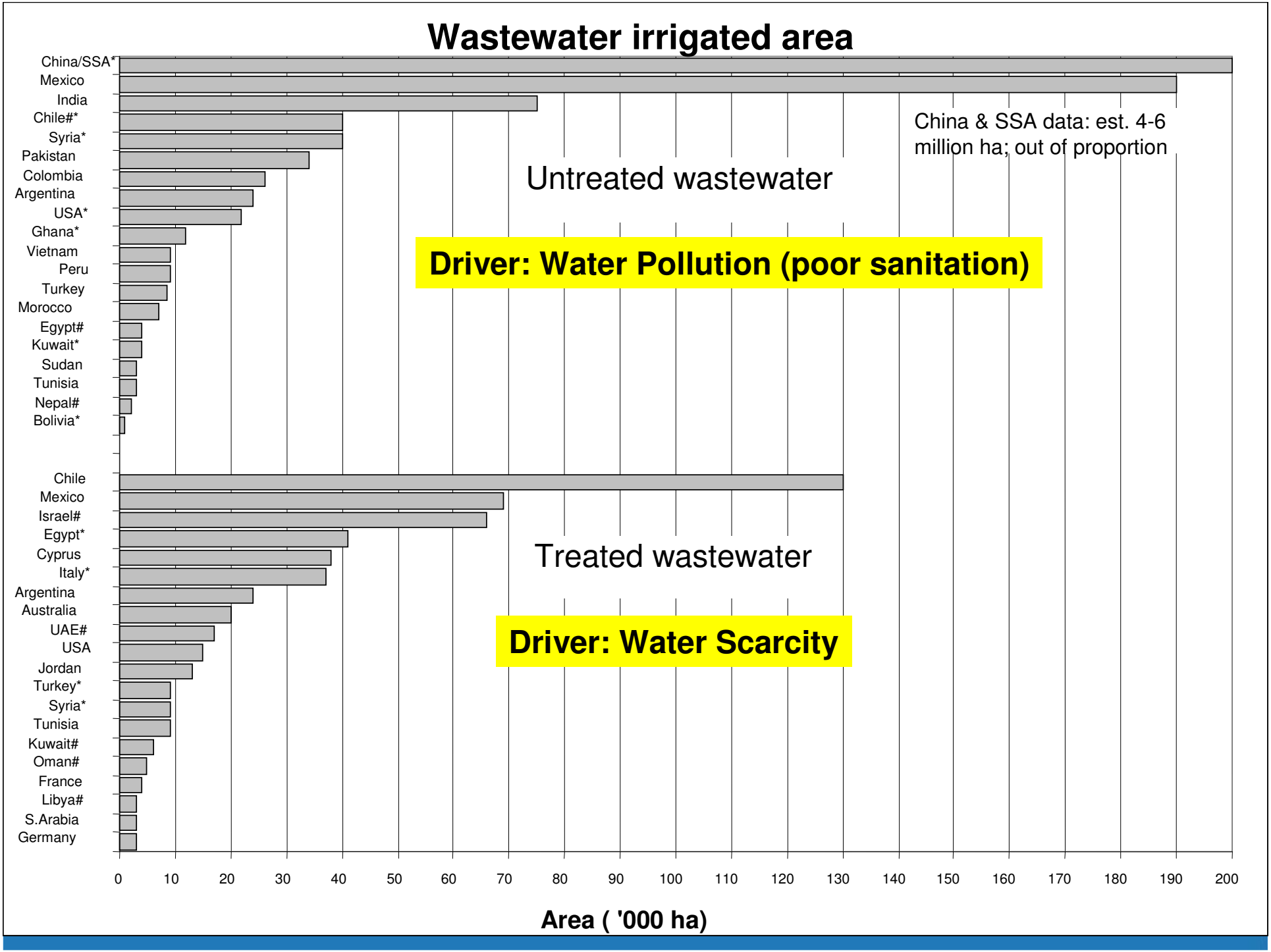
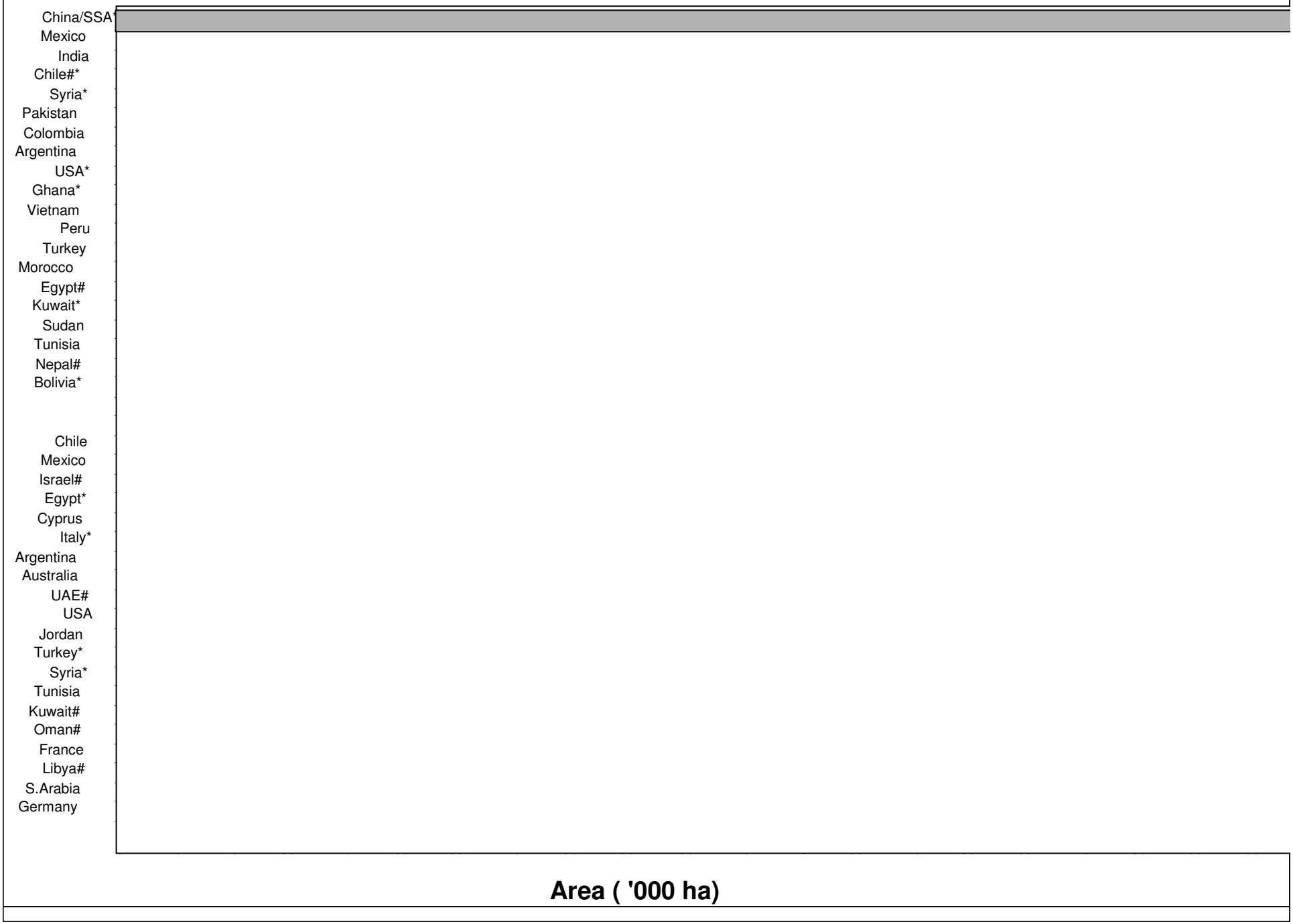
www.iwmi.org


Wastewater irrigated area
China/SSA*
Mexico
India
Chile#*
Syria*
Pakistan
Colombia
Argentina
USA*
Ghana*
Vietnam
Peru
Turkey
Morocco
Egypt#
Kuwait*
Sudan
Tunisia
Nepal#
Bolivia*
China & SSA data: est. 4-6 million ha; out of proportion
Untreated wastewater
Driver: Water Pollution (poor sanitation)
Chile
Mexico
Israel#
Egypt*
Cyprus
Italy*
Argentina
Australia
UAE#
USA
Jordan
Turkey*
Syria*
Tunisia
Kuwait#
Oman#
France
Libya#
S.Arabia
Germany
Treated wastewater
Driver: Water Scarcity
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
Area ('000 ha)


China/SSA*
Mexico
India
Chile#*
Syria*
Pakistan
Colombia
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Vietnam
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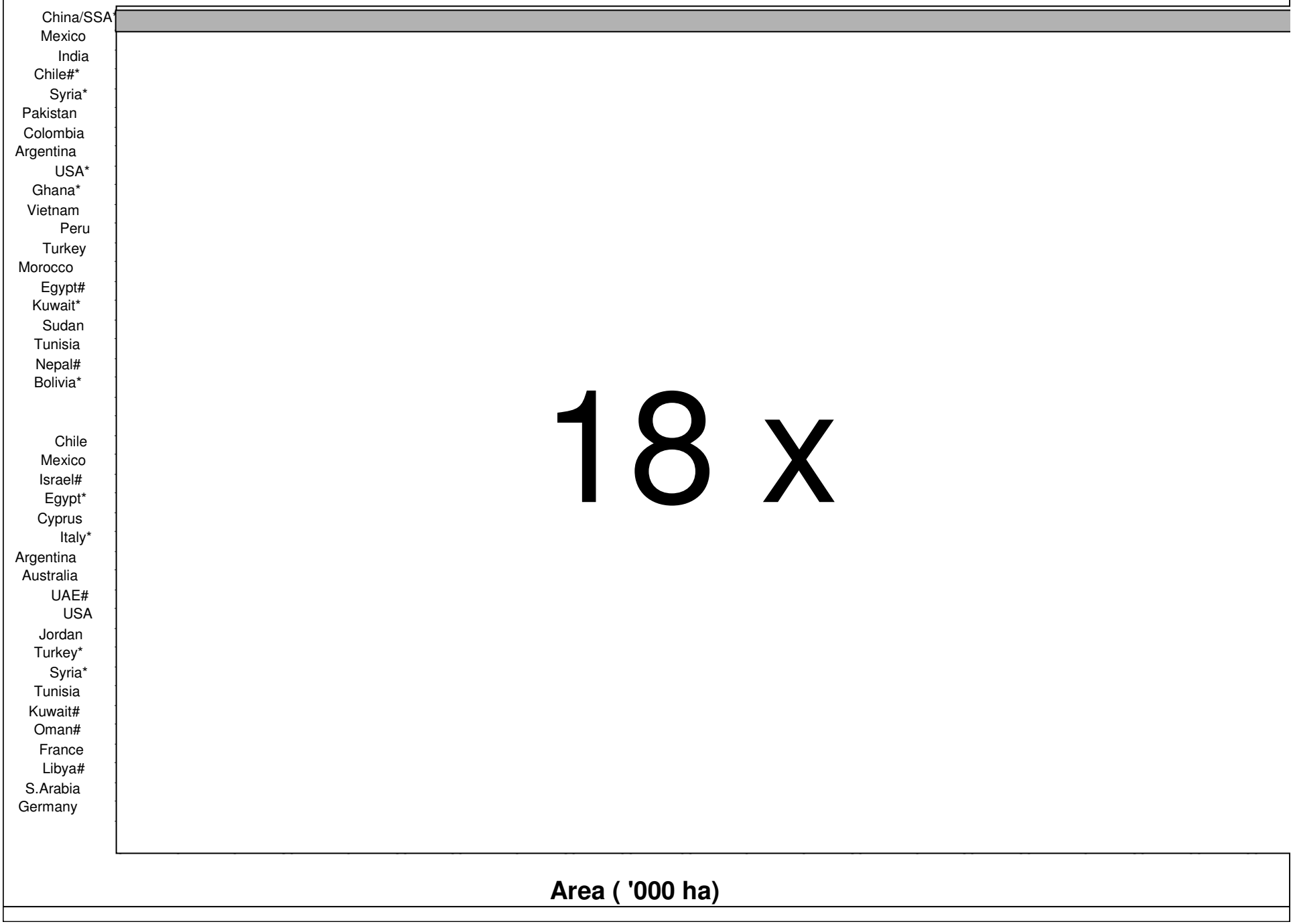
Egypt#
Kuwait*
Sudan
Tunisia
Nepal#
Bolivia*
Chile
Mexico
Israel#
Egypt*
Cyprus
Italy*
Argentina
Australia
UAE#
USA
Jordan
Turkey*
Syria*
Tunisia
Kuwait#
Oman#
France
Libya#
S.Arabia
Germany
Area ('000 ha)


China/SSA*
Mexico
India
Chile#*
Syria*
Pakistan
Colombia
Argentina
USA*
Ghana*
Vietnam
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Turkey
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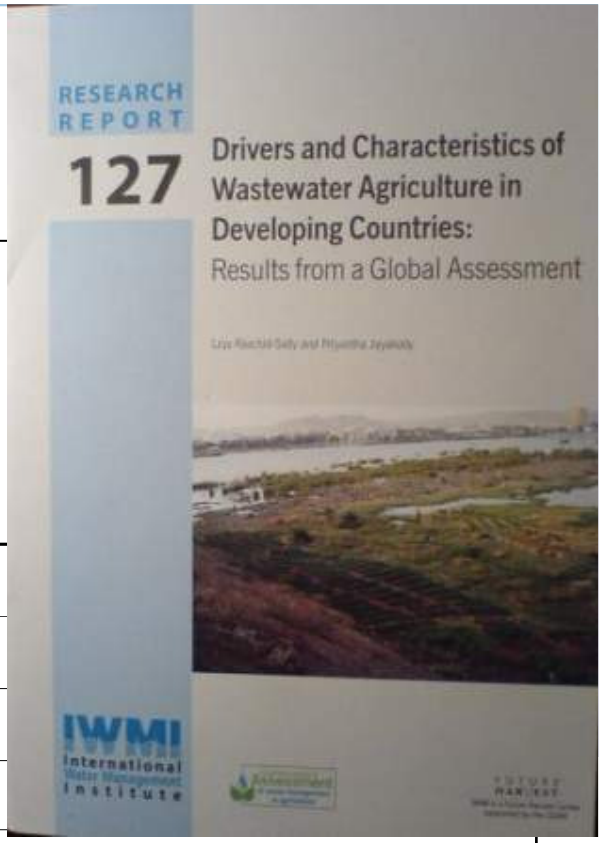
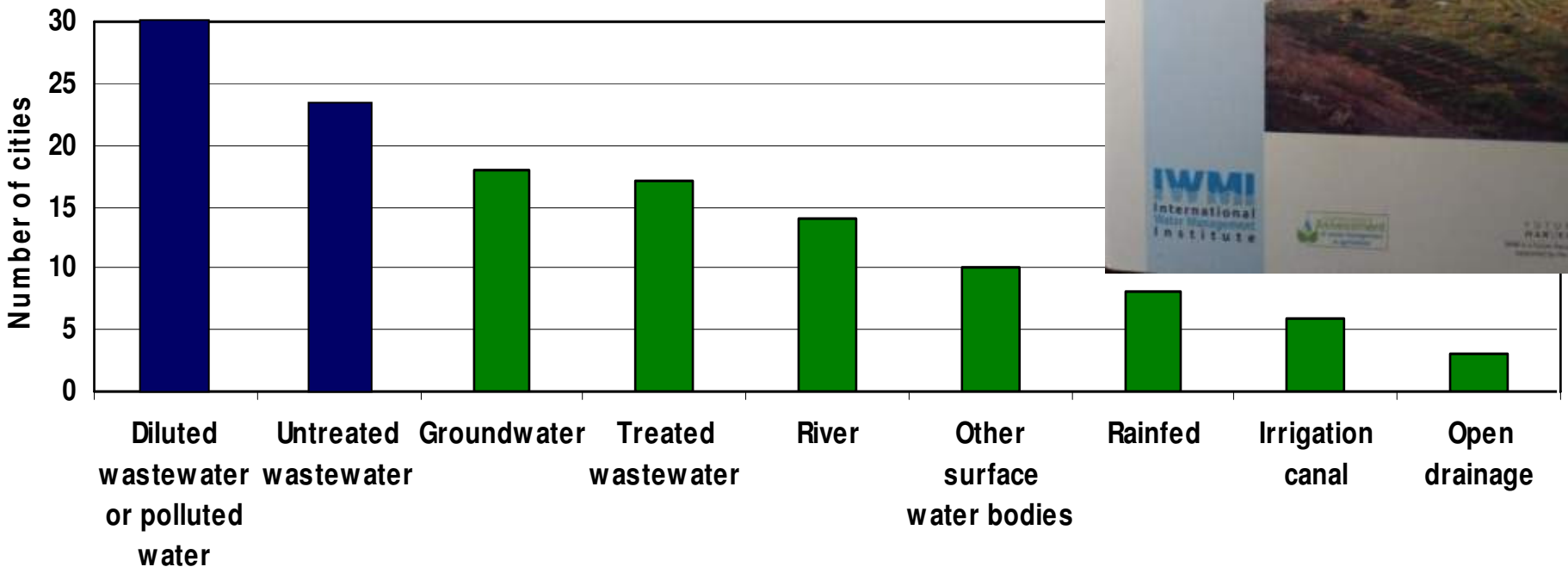
Egypt#
Kuwait*
Sudan
Tunisia
Nepal#
Bolivia*
Chile
Mexico
Israel#
Egypt*
Cyprus
Italy*
Argentina
Australia
UAE#
USA
Jordan
Turkey*
Syria*
Tunisia
Kuwait#
Oman#
France
Libya#
S.Arabia
Germany
18 x
Area ('000 ha)

In and around three of four cities in the developing world farmers use polluted irrigation water for the production of high value crops





In some countries, like Ghana, we have 10 times more hectares under such “informal” urban and peri-urban irrigation than in official rural irrigation schemes in the whole country

In response to pollution as a driver

- Target: Minimising health risk through WASH and FH
  - Global and national assessments
  - Health risk assessments (farmers, consumers)
  - Health risk mitigation (w & w/o treatment)
  - Cost effectiveness analysis

Partner: WHO, FAO, Universities of Copenhagen, Leeds, Melbourne, etc.

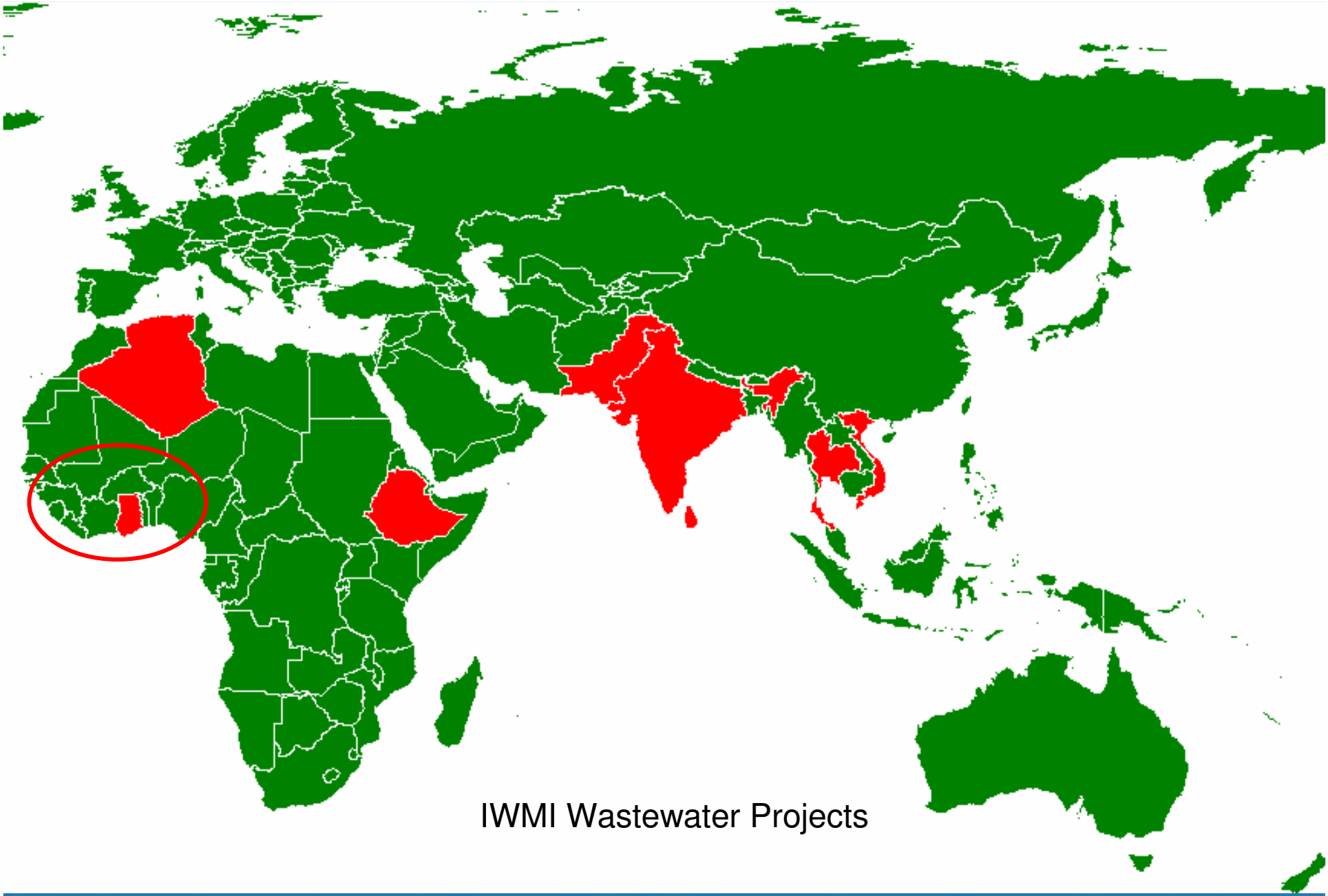
In response to water scarcity as driver

- Target: Wastewater Governance
  - Multi-stakeholder dialogues (sanit.<-> agric.)
  - Capacity building

    "*Treatment for disposal*"

    → *"Treatment for reuse"*

Partner: Universities of California, Durban, Wageningen, Melbourne etc.


IWMI Wastewater Projects

Highlights from a few IWMI projects in Asia

- Pioneering work in Pakistan on the economics of high value cash crop cultivation with sewage in formal irrigation schemes – farmers purchasing ww from municipal authorities.
- National assessments in Pakistan and Vietnam on ww use in agriculture follwed by more in depth research with farmers in on farm.
- More recent work in Bangladesh and Sri Lanka on wastewater for livelihoods (WASPA program) through participatory action planning for risk minimisation, with local authorities farmers and polluters for improving governance.
- IWMI is the focal point for RUAF activities in Asia with a major program on UPA in India.

In Africa focus on Ghana – many in depth studies

RUAF From Seed to Table (FStT)

The value chain approach in urban vegetable production in Accra, Ghana (Dzorwulu, Roman Ridge and Plant pool urban farmers)

Improved production and marketing of lettuce and other strategically selected vegetables for sale in producer owned shops and restaurants and hotels".

Technical/organizational innovation (UPFS)

Improved production of vegetables

For sale

Farmer owned shops

Hotels

Restaurants

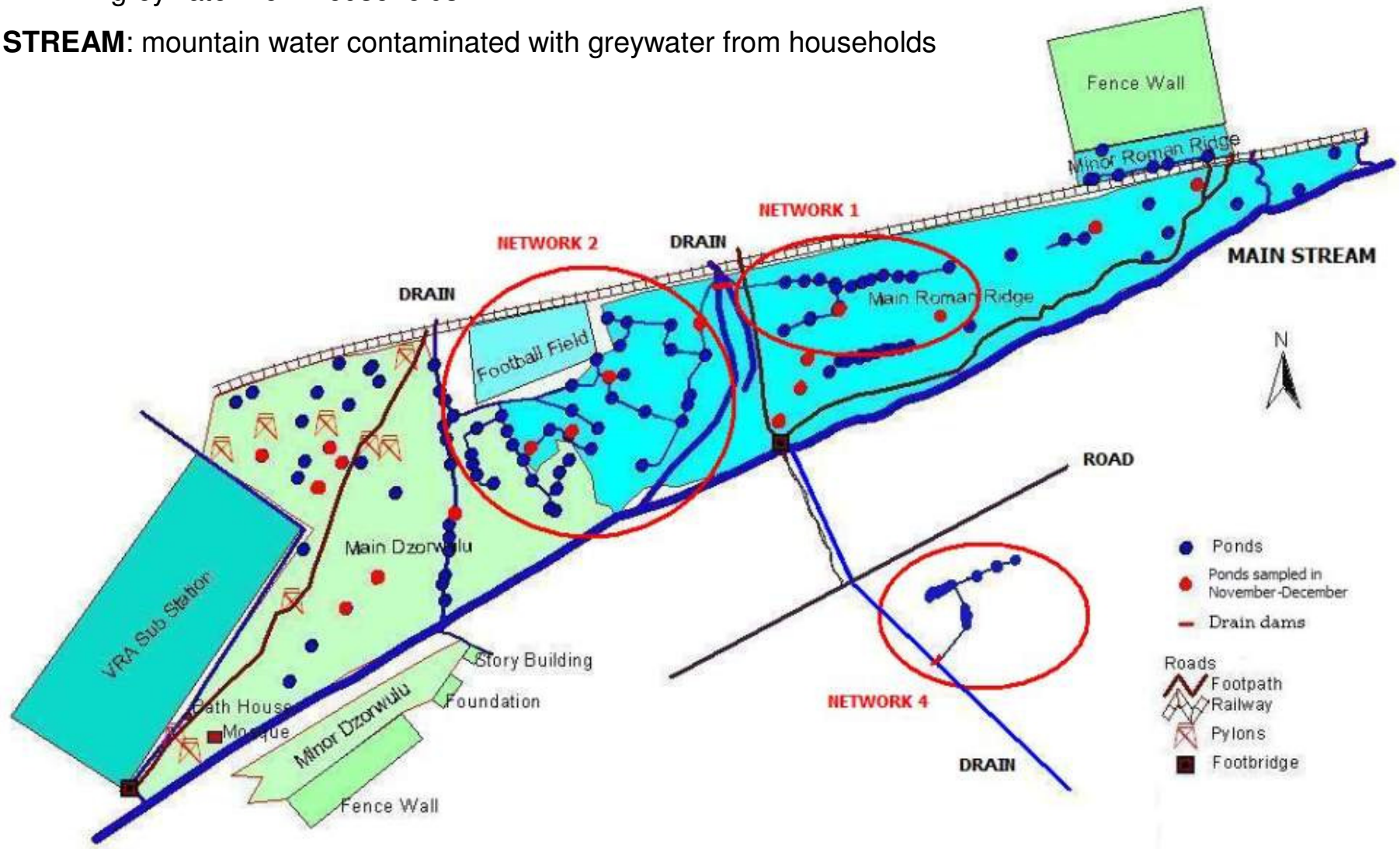
More work on field sites in Accra

- Turning dug-outs into sedimentation ponds.
- Turning cascades of dug-outs (or reservoir) into an on-farm “treatment” system
- Wastewater filtering to remove organic human waste
- Ongoing investigation on Urine use -
  Link to productive sanitation- collaboration with a private entrepreneur

DZORWULU – ROMAN RIDGE FARMING AREA

DRAIN: greywater from households

STREAM: mountain water contaminated with greywater from households



IWMI
International
Water Management
Institute

www.iwmi.org

Improvin hoods and nature

Co-composting Pilot Station, Kumasi

COMLIZER development

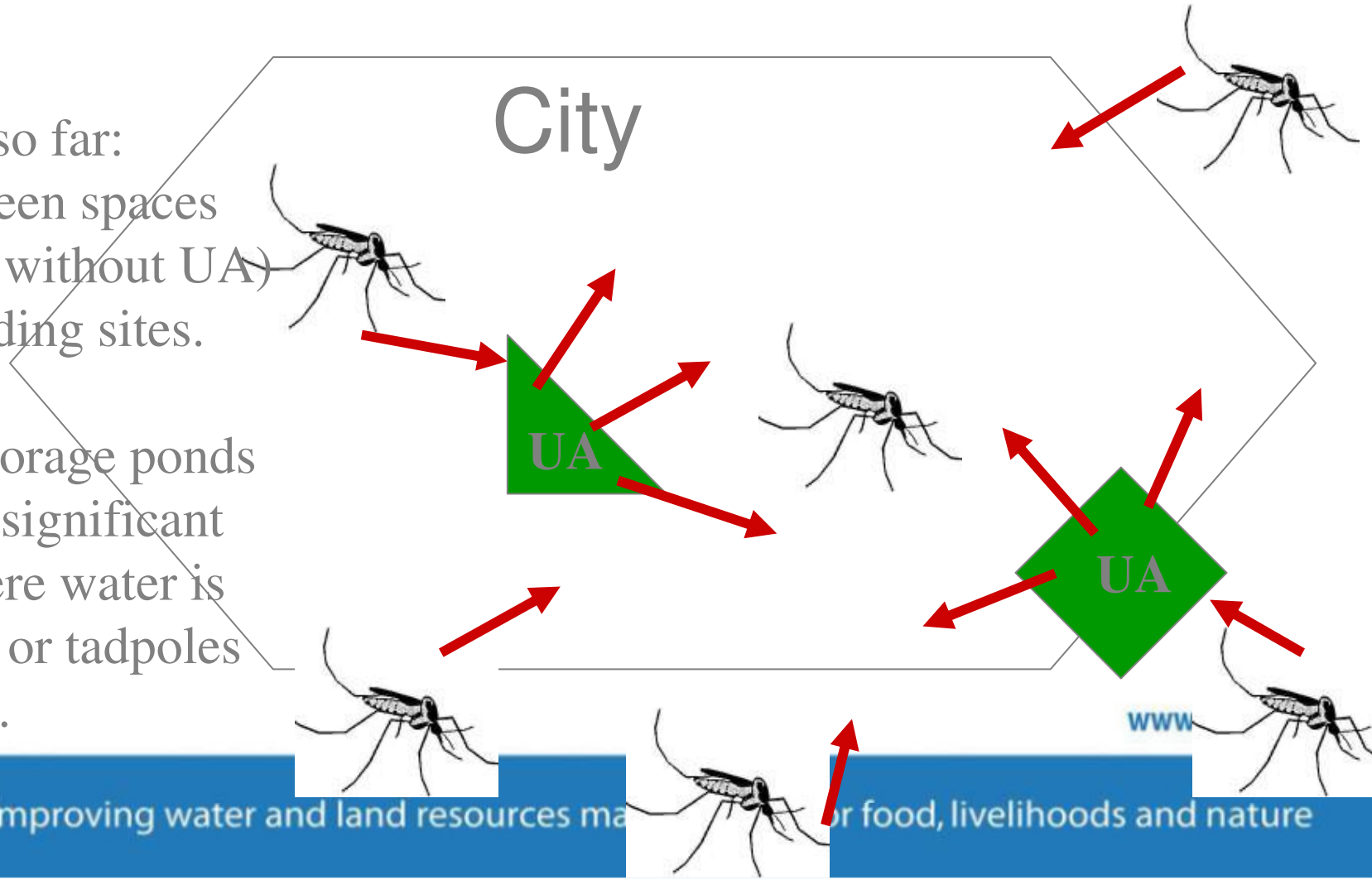
Fortification of fertilizer with excreta based compost

Does irrigated UA open the city door for *Anopheles* and lead to urban malaria ?

(Kumasi, Accra)

Results so far:
Open green spaces (with or without UA) are breeding sites.

Water storage ponds have no significant role where water is polluted or tadpoles frequent.



Outputs & Impacts

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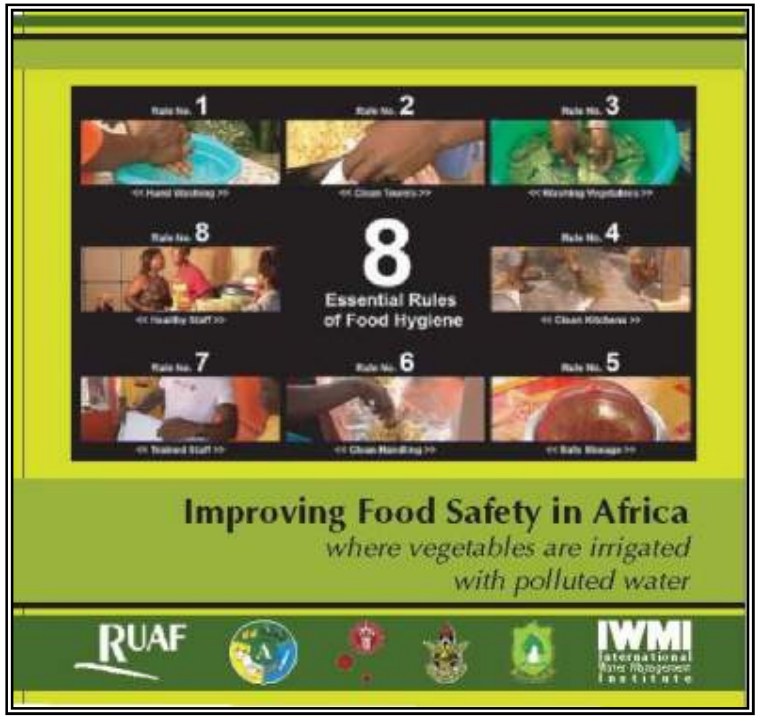
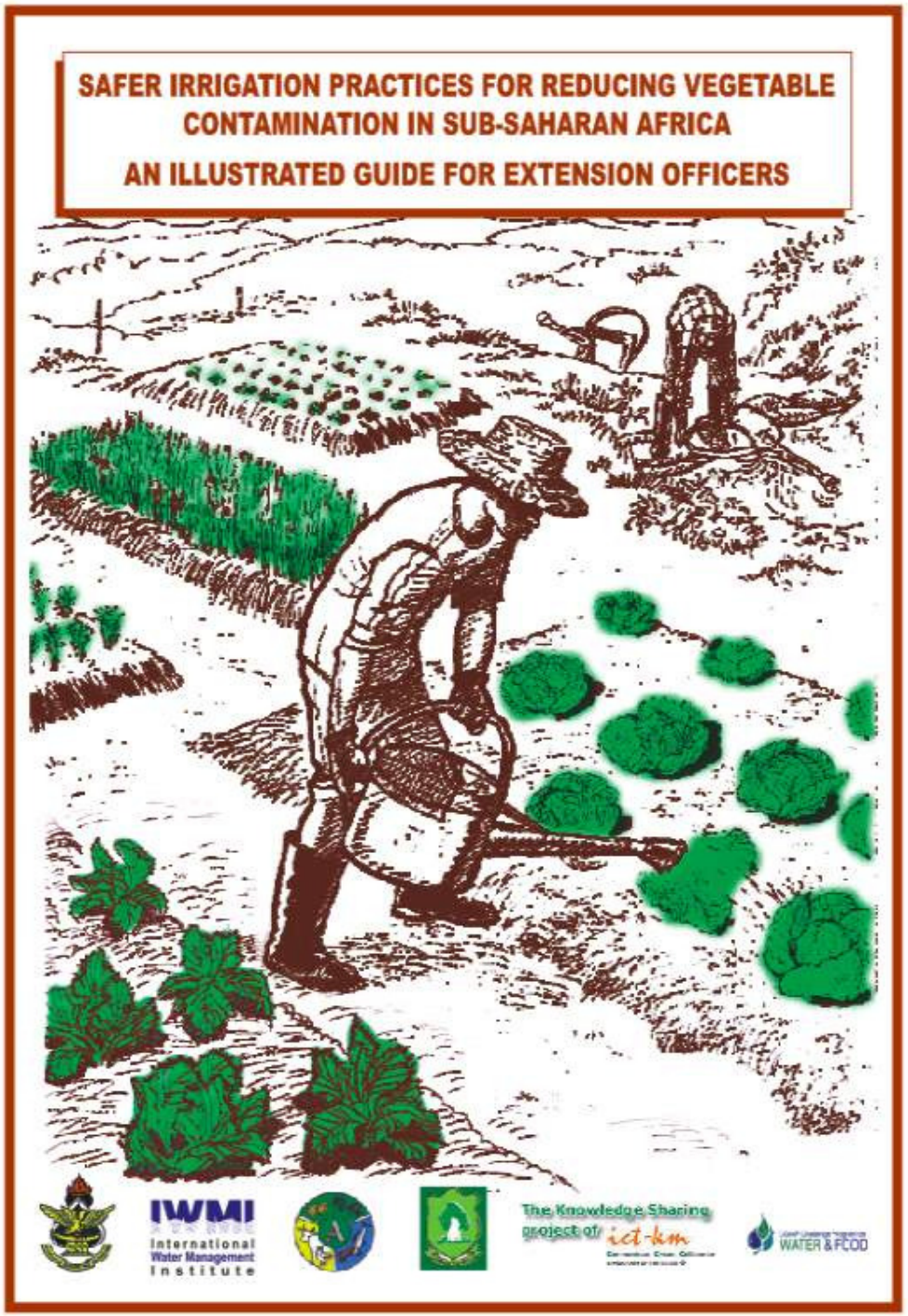
Improving water and land resources management for food, livelihoods and nature

Videos for trainers

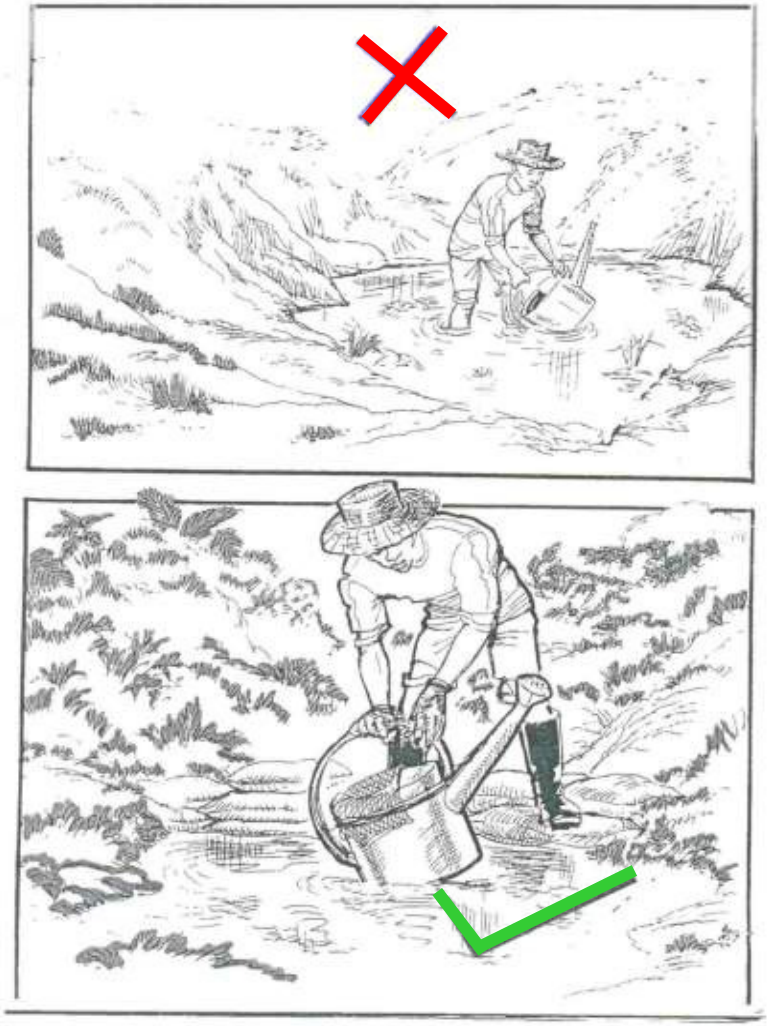


All videos available online

video.google.com/videoplay?docid=-3530336707586348166&hl=en
(good farming practices)
video.google.com/videoplay?docid=-6891955003003280662&hl=en
(good practices for street food restaurants)
video.google.com/videoplay?docid=-8395461859469738471&hl=en (introduction into the wastewater irrigation challenge)



Supporting FFS Guidelines



FAO
FIAT PANIS

Regional adaptation of educational materials

www.iwmi.org

Improving water and land resources management for food, livelihoods and nature

Accra: from Arrest to Award

Influencing municipal and national policies and regulations

Key partner:

RUAF Foundation
Resource Centres on Urban Agriculture & food security

Recognition of CPWF38 & CP51

- CGIAR approves linked *Knowledge Sharing* project 2006
- WHO & FAO selected our field trials to test their new wastewater use guidelines (multi-barrier approach) 2007
- Our team becomes member of Global Expert Panel *CODEX ALIMENTARIUS* Fresh fruits & Vegetables" 2007
- FAO selected our field trials to develop *FFS modules* on wastewater use 2007
- Best Policy Paper prize at IWA Specialist Conference on Wastewater 2007
- WHO approves our adaptation of their food safety poster 2007
- Results influenced Ghana's National Irrigation Policy 2008
- WHO is asking us for fact sheets for extension officers and national policy makers explaining their new guidelines 2008
- Google Foundation is asking for a feasibility study on how to translate the research into impact at national scale 2008