RESEARCH PROGRAM ON Water, Land and Ecosystems

Resource Recovery and Reuse

LESSONS FROM R4D IN PRODUCTIVE SANITATION

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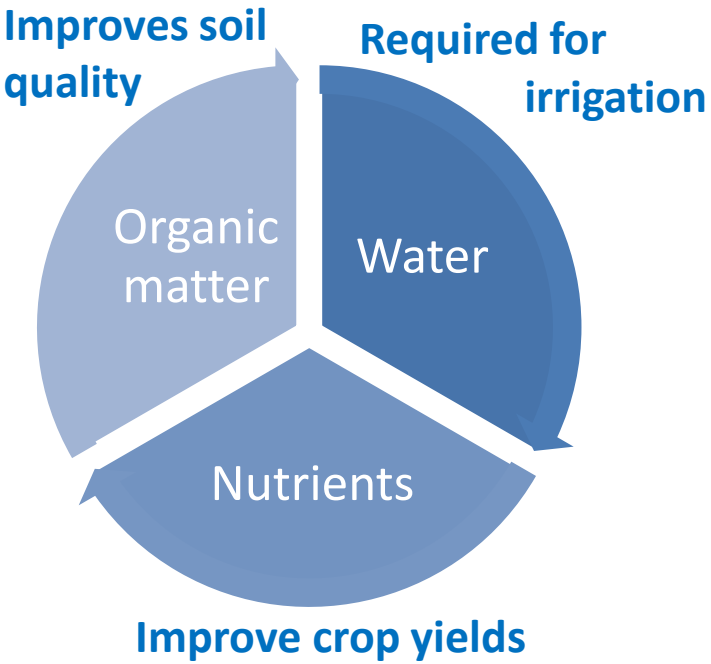
OUTLINE

I. History of IWMI's work

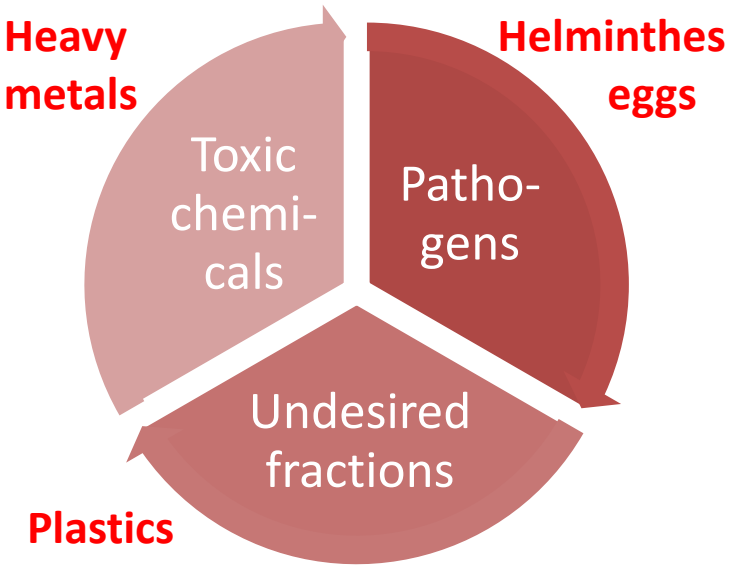
II. Lessons

WHAT IS CONTAINED IN WASTE ?

Opportunities



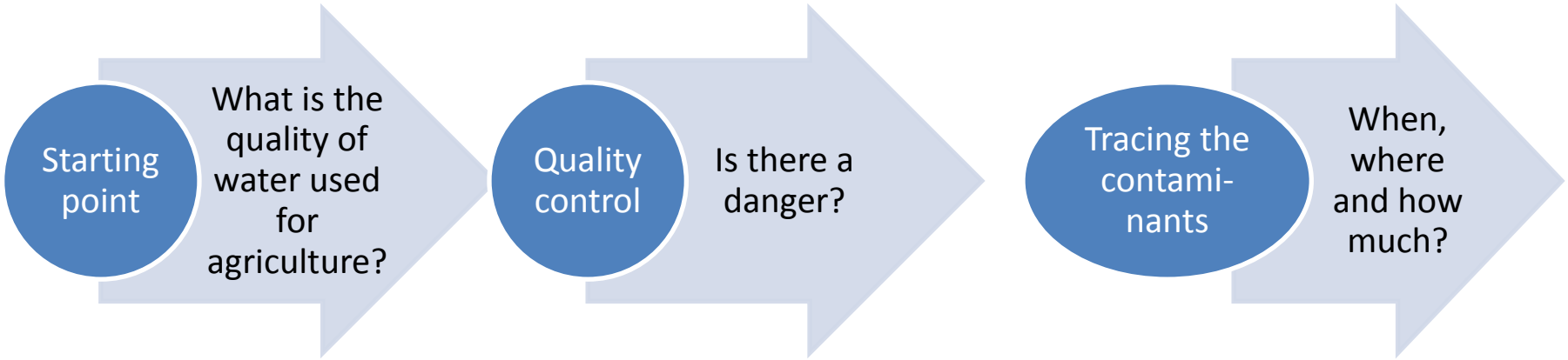
Challenges



Safe quality improvement <u>required</u>

HISTORY - WASTEWATER MANAGEMENT

Between 2003 and 2007. Understanding the issues.



Water quality in urban/peri-urban areas is poor for unrestricted irrigation

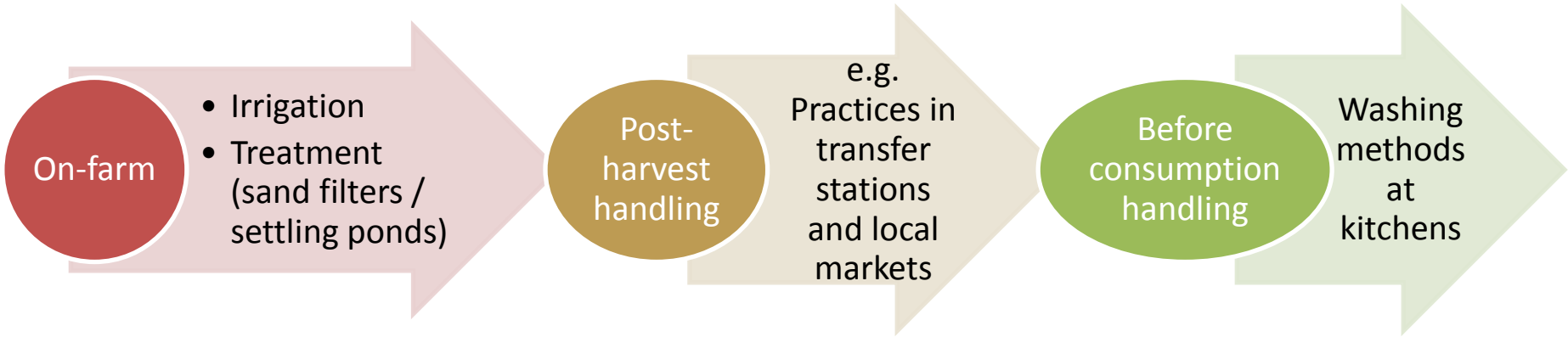
Quality of vegetables is poor

Most of the contami-nation occurs on-farm (soil and inputs)

Ghana; Ongoing in Burkina Faso, Cameroon, Mali

POSSIBLE STRATEGIES FOR RISK MITIGATION

Between 2006 and 2010. Development of the multiple barrier approach.



A combination of at least two strategies needed for effectiveness

Recommendations made, taking into account local practices

Knowledge sharing (trainings / WHO)

Ghana, Burkina Faso, Togo, Benin, Cote d'Ivoire

POSSIBLE STRATEGIES FOR SUSTAINABLE OPERATION OF WASTEWATER TREATMENT PLANTS

Since 2011. Testing business models for safe water reuse.

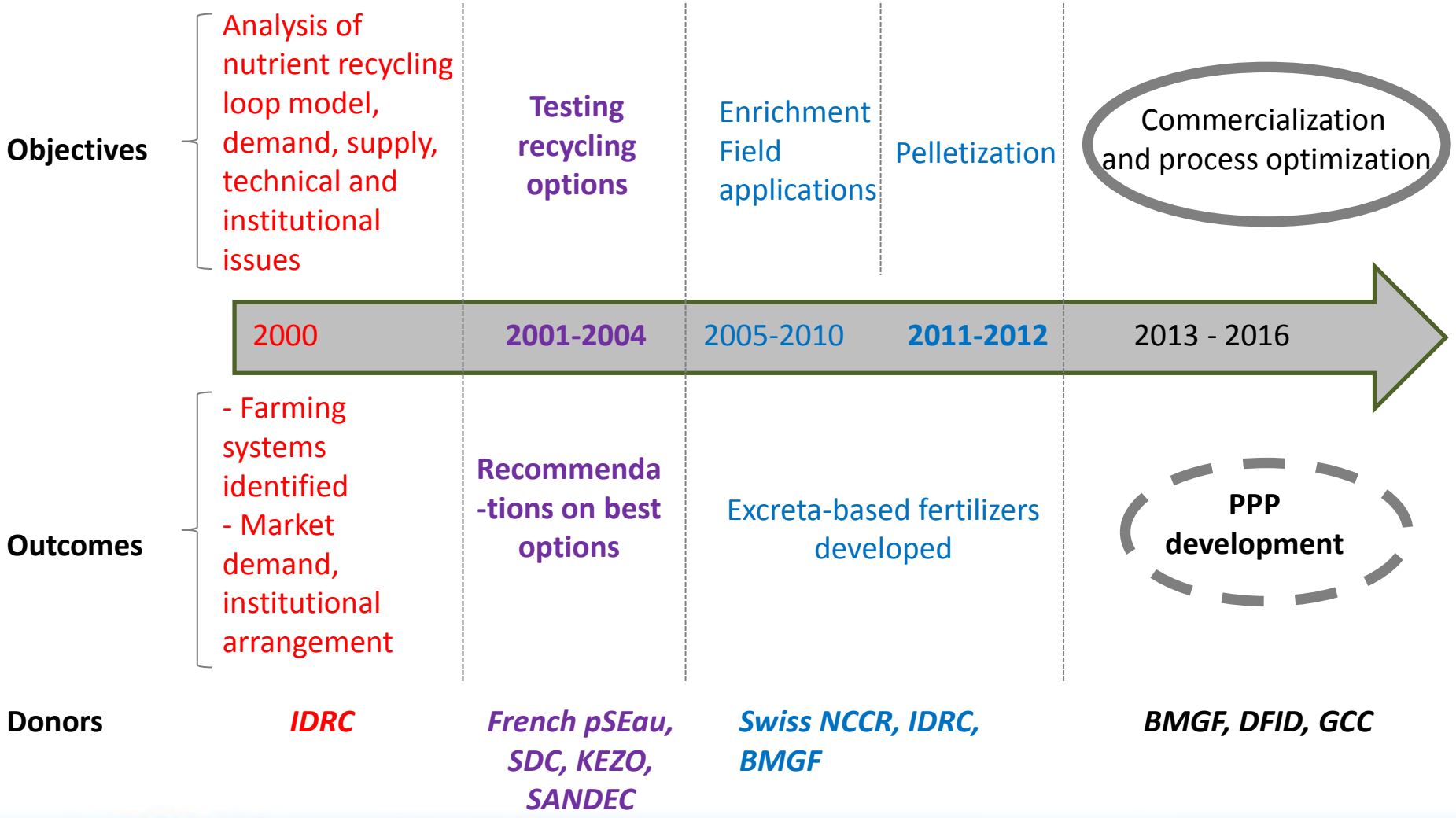
Treatment plant designed to allow reuse		
Safe reuse in irrigation	Safe reuse in aquaculture (e.g. Catfish)	On-site energy production (e.g biogas)

Financial sustainability of the initiatives / risk mitigation

Clarias gariepinus
(African catfish)

Ghana; Exploring for Burkina Faso, Benin and Mali

HISTORY OF FECAL SLUDGE (AND ORGANIC SOLID WASTES) REUSE GUIDELINES



BUSINESS MODEL FOR THE FIRST CO-COMPOST PLANT

Land & Facilitation of access to fecal sludge

Management & Other necessary financial resources

Financial support for capital construction, marketing and Technology know-how

TMA

Private sector

Wafo Project

Private truck operators (liquid waste)

$

Fortifer Co-compost Plant
Capacity: 500 tons per year

Compost

$

Farmers
Landscape
Agroforestry
and other
customers

Partners: IWMI / Training Research & Networking for Development (TREND) / Universities

LOOKING BACK, …

What worked?

- Research:
  - Strong / Adequate knowledge acquired
  - Good understanding of the challenges
  - Technology innovation
- Some buy-in from donors
- Positive influence on policy (MoFA, Ghana; WHO)

LOOKING BACK, …

- **The private sector per se is not a panacea for solving the sanitation problems.**
  - There are strong and weak players
    - We need to rethinking partnerships and supporting legislations
- For Reuse, we need e.g. fertilizer companies and not only companies strong in waste collection and transformation.
- Government can support reuse/recycling;
  - Favorable policy environment
    - Many permissions needed
    - Processes for getting these are cumbersome
    - Imposing the selling of X% of compost (e.g. in India).
  - Clear protocols with standards and benchmarks.

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THANKS FOR YOUR KIND ATTENTION !

THE FORTIFER TECHNOLOGY, FOR SAFE RECYCLING OF NUTRIENTS AND ORGANIC MATTER

Raw liquid fecal sludge from tankers or collection points

Drying beds

Excess liquid to be treated. e.g. in a pond

Dry FS

Organic waste

Composting

Raw solid FS e.g. from dry toilets

Regular turning and addition of water

Compost

Grinding

Starch & Ammo-nium sulphate

Mixing

Water

Raw pellet

Pelletization

Drying

Heat

Pellet packaging and use

- Fortifer is safe.
- Volume reduced by 20-50%

- No dust during application
- Nutrients are gradually being released into the soil
- < 10 US$ per bag of 50 kg

IWMI International Water Management Institute

A water-secure world

FIELD TRIALS WITH TOGO MARSHALL RICE VARIETY

Rice field (conventional Farmer's practice)

200 kg of NPK 15-15-15 and 100 kg of AS. Top dressed with 50 kg of urea

Rice field with Fortifer.

1,000 kg of enriched compost. Top dressed with 30 kg of ammonium sulfate (AS)

Source: Ofosu-Budu, 2010, 2011, 2012

Yields were 20-50% higher with Fortifer