



Agenda

- 1. Welcome and introductions
- 2. Update on programme Stephen Passmore
- 3. Use case development Rembrandt Koppelaar
- 4. Discussion and ranking session
- 5. AOB
- 6. Next steps and Close

http://ecosequestrust.org/GAMA



WASH Use Case Development

FCA Resilience.IO Platform for Water Sanitation and Hygiene In Great Accra Metropolitan Area, Ghana

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Use Case Selection Purpose

The focus of the Resilience.IO prototype model is decision support by providing:

- An Integrated status picture of WASH in GAMA
- Insights in key WASH planning questions
- An exploration of how WASH planning indicators can be met
- An examination of future socio-economic development & impacts
- An evaluation of potential technology and policy decision options

The use cases of particular WASH challenges selected by you today determine the WASH topic focus

What are the priority issues!

Timetable for use cases

- Nov./Dec.
- January 14th Webinar
- March 10th Webinar

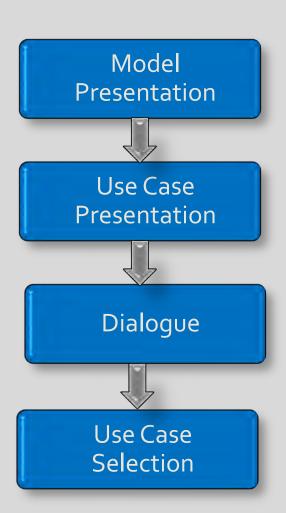
- April Workshops
- April Launch

April

- Enrich use cases and create first version
- First use case modelled results and discussion
- Discussion of specific use case topic challenges and further improvements
- Collaborative small group workshops in Accra
- Use case demonstration for using prototype model in WASH decision support in Accra
- Make prototype model and datasets available (downloadable for free online)

Today's Objectives

- Present brief overview of model support
- Present a summary of six potential use cases
- Dialogue on six use cases, priorities, additional challenges and adjustments
- Scoring of use cases for selection of three to implement



Model Support

Provide visibility on water and wastewater related flows for the entirety of the

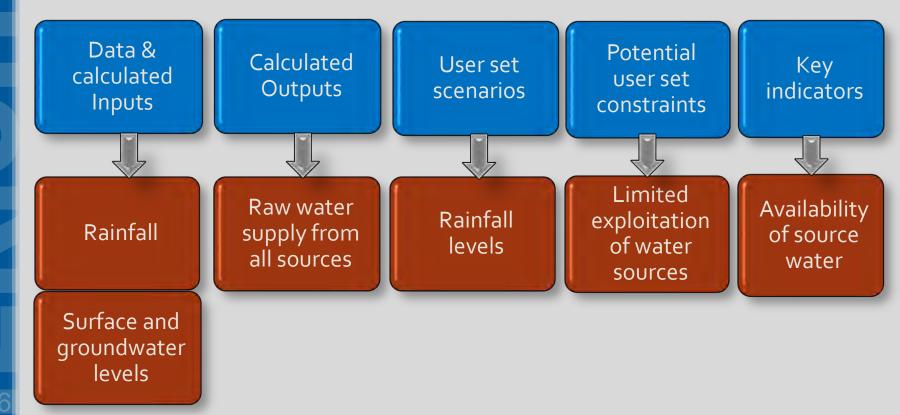
Greater Accra Metropolitan Area by district for:

- Raw water collection/availability
- Source water treatment
- Potable water distribution
- Water use
- Wastewater/Sewage collection
- Waste water treatment
- Sanitation treatment
- Long-term socio-economic scenarios

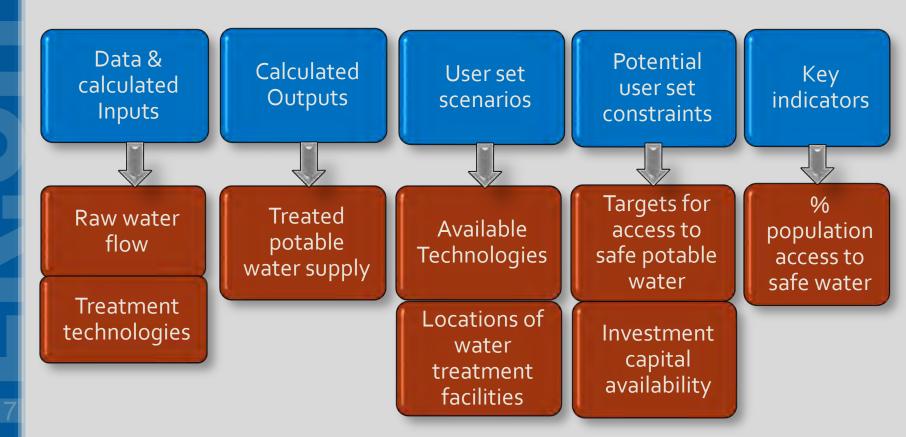




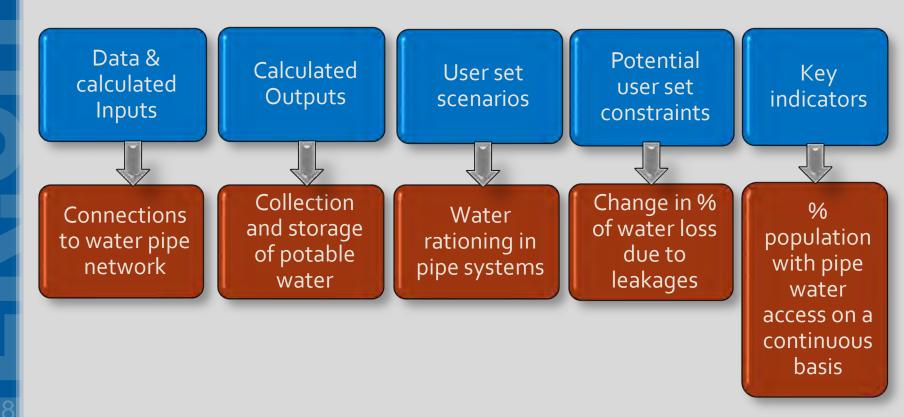
Model Component 1: Raw water collection & water availability



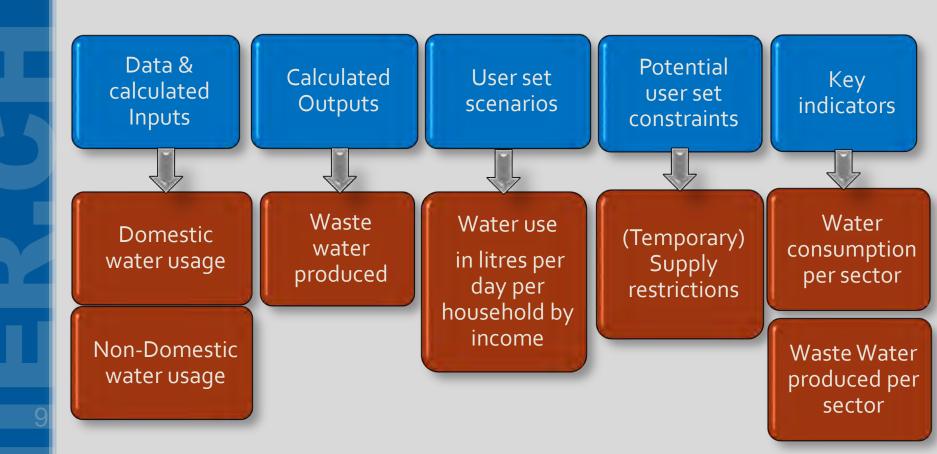
Model Component 2: Source water treatment



Model Component 3: Potable water distribution



Model Component 4: Water Usage



Model Component 5: Wastewater and sewage collection

Data & calculated Inputs

Calculated Outputs

User set scenarios

Potential user set constraints

Key indicators

Human excreta generation Sewage pipe network collection

Cesspit truck collection

Open drain environment outflow

Use of public sanitation facilities

Sewage pipe infrastructure development

Number of people with access to sanitation

Waste water & human excreta collected per disposal route

Model Component 6: Waste water treatment

Data & calculated Inputs

Calculated Outputs

User set scenarios

Potential user set constraints

Key indicators

Sewage flow from human activities

Waste water treatment technologies

Proportion of treated waste water before discharge

Usable byproducts produced Available technologies

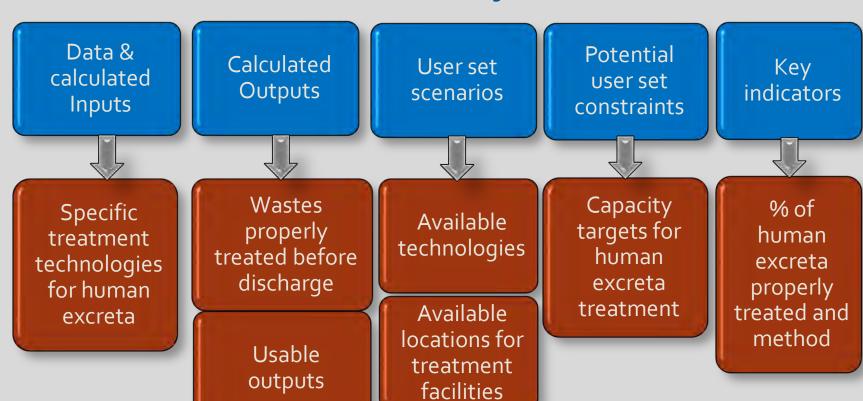
Available locations for treatment facilities

Capacity target of waste water treatment

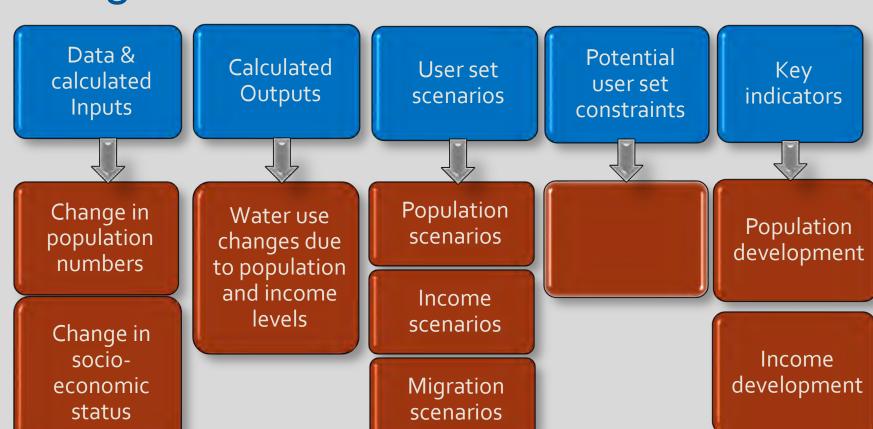
Availability of investment capital

% of wastewater treated per sector before discharge

Model Component 7: Sanitation treatment systems

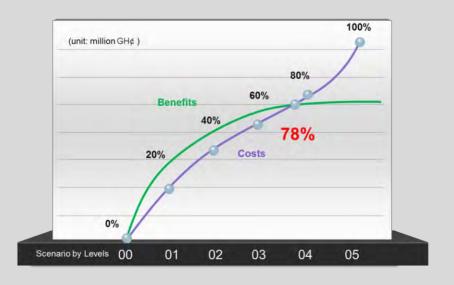


Model Component 8: Long-term socio-economic scenarios



Key outputs for each use case:

- Output indicators to assess the best action, such as the costs of providing safe portable water
- A cost-benefit style analysis (CBA) to calculate the ratio of:
 - > favourable outcomes
 - to associated infrastructure operational and investment costs
- Gradually varying parameters to be compared to a business-asusual situation



WASH Challenges - Six Use Cases

- 1. Assess outcomes of ongoing WASH projects and gaps towards meeting macro-level WASH targets for planning
- 2. Examine possibilities and costs to increase household access to improved potable water sources
- 3. Calculate capacity needs **to end water rationing issues** within the existing water pipe network area
- 4. Examine infrastructures that will meet the challenge of waste water and fecal sludge collection and treatment
- 5. **Improvement of health issues** caused by unimproved water access and absence of sanitation infrastructure
- 6. Increase availability of clean, accessible, and affordable toilet infrastructure

Use Case 1 - Projects & Targets Assess outcomes of ongoing WASH projects and gaps towards meeting macro-level targets for planning

 Capacities and time frame of all ongoing projects

- Targets and goals from local, national policies and international agreements

Input



Model use



- Calculate combined effect of on-going projects when fully completed
- Estimate gaps remaining to targets

Modelled use case

- 5 to 20 years of population, economic status, and migration
- Socio-economic scenarios



Scenarios



Output

- Costs/benefits from successful completion
- Additional effort and possibilities to meet targets

Use Case 1 - Projects & Targets Assess outcomes of ongoing WASH projects and gaps towards meeting macro-level targets for planning

Projects currently on-going within the GAMA region include:

- The ADB <u>Accra Sewerage</u>
 <u>Improvement Project</u> (ASIP)
- The World Bank GH-GAMA
 Sanitation and Water Project (GH-GAMA)
- The DANIDA <u>Sludge Treatment</u>
 <u>Project at "Lavender Hill"</u> and
 <u>Bolah-Bondeh</u> project

Example targets include:

- Increase urban water and sanitation coverage to 100% by 2025 (Ministry of Water Resources, Works and Housing WSSDP 2012-2025)
- By 2030 achieve access to adequate and equitable sanitation and hygiene for all and end open defecation (sustainable development goal 6.2)

Use Case 2 - Improved Drinking-water Examine possibilities and costs to increase household access to improved potable water sources

- Pipeline connections
- Decentralized water supply (boreholes/wells)
- Household data

Input



Model use



- Calculate water use based on population development
- Ascertain the most cost effective technologies and infrastructure

Modelled use case

- 5 to 20 years of population, economic status, and migration
- Household water use development



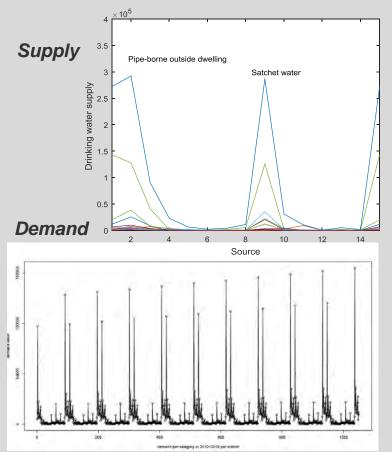
Scenarios

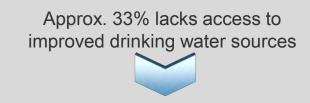


Output

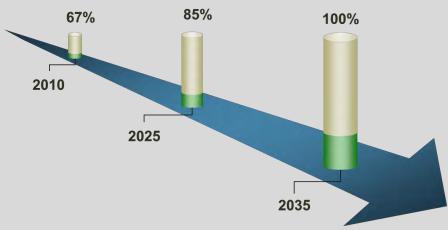
- Technology capacity and infrastructure plan for universal access to improved potable water

Use Case 2 - Improved Drinking-water Examine possibilities and costs to increase household access to improved potable water sources





Universal access to such drinking water sources within GAMA



Use Case 3 - Water Rationing Calculate capacity needs to end water rationing issues within the existing water pipe network area

Modelled

use case

- Existing pipeline system and rationing schemes
- Water demand from pipe connected consumers

Input



Model use



- Quantify water demand and rationing strategies
- Meet water demand with minimal capital investments and operating costs

- Business-as-usual

- Water rationing completely ended
- Population and water needs increase



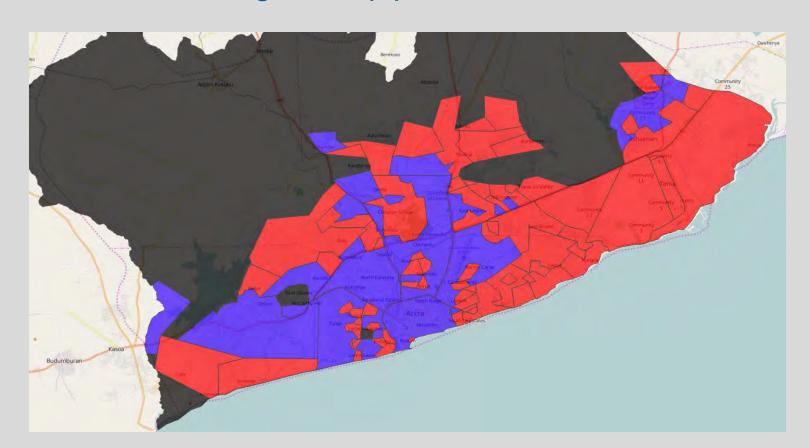
Scenarios



Output

- Operational plan of water rationing and what options to end it
- Investment and operating costs of each obtained plan

Use Case 3 - Water Rationing Calculate capacity needs to end water rationing issues within the existing water pipe network area



Use Case 4 – Liquid Waste Collection & Treatment Examine infrastructures that will meet the challenge of waste water and faecal sludge collection and treatment

Modelled

use case

- Current transport and treatment situation
- Existing sewage network and cesspit emptier trucks

Input



Model use



- Estimate generation and flow of waste water and human liquid waste
- Treatment of waste water, faecal sludge and septage

- Treatment capacity investment limits

- Performance criteria
- Population density

Scenarios

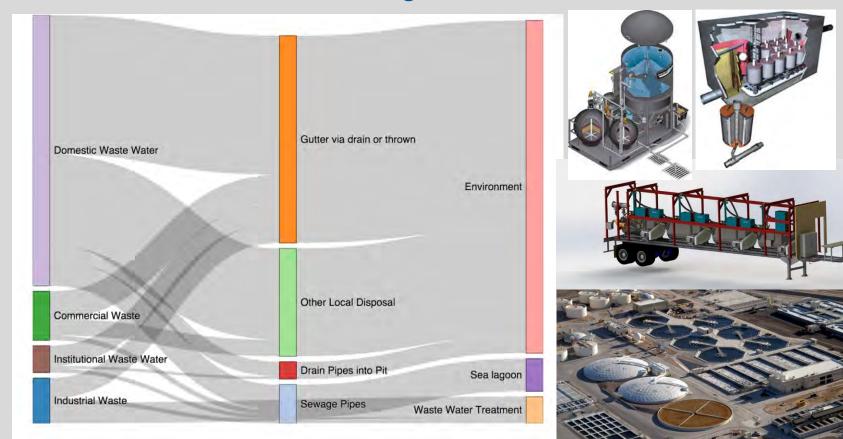
- Emerging new technologies



Output

- Technology Facilities and infrastructure
- Costs and benefits of new treatment systems
- Feasible, economic, and sustainable plan

Use Case 4 – Liquid Waste Collection & Treatment Examine infrastructures that will meet the challenge of waste water and faecal sludge collection and treatment



Use Case 5 – Health Issues Improvement of health issues caused by unimproved water access and absence of sanitation infrastructure

- Key waterborne diseases
- Environment and health benefits of cleaner water
- Wastewater Discharge points

Input



Model use



- Calculate changes in unimproved water access, improved sanitation infrastructure, and treated wastewater

Modelled use case

- Indicators to denote health impacts of drinking unimproved water, faecal exposure, and wastewater



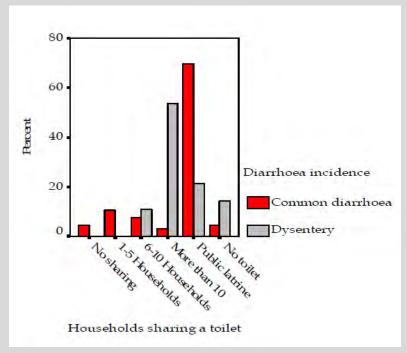
Scenarios



Output

- Indication of environmental discharge changes
- Indication of health impacts of improvement

Use Case 5 – Health Issues Improvement of health issues caused by unimproved water access and absence of sanitation infrastructure



The distribution of childhood diarrhoea according to the number of households sharing a toilet

- Boadi, K., (2004).
 Environment and
 Health in the Accra
 Metropolitan Area,
 Ghana. PhD Thesis
 University of
 Jyvaskyla.
- Dataset from interviews among 960 households

Use Case 5 – Health Issues Improvement of health issues caused by unimproved water access and absence of sanitation infrastructure



Everyone in the city of Accra (the Greater Accra Metropolitan Area), regardless of economic and social status, will have access to **uninterrupted water supply**, at an affordable price within a reasonable distance from the house.

At least 80 percent of Accra's citizens have access to an acceptable level of sanitation facilities, including flush toilets, KVIPs or good public toilets. Pan and bucket latrines are fully phased out.

A cleaner city with a well-functioning drainage system and integrated solid waste management

Use Case 6 - Toilet Infrastructure Increase availability of clean, accessible, and affordable toilet infrastructure

- Public toilet waiting time, influence of unclean/clean public toilets, affordability and cultural constraints

- Local decentralized systems of faecal treatment

Input Model use

Modelled

use case



- Simulate people's behaviors using existing sanitation infrastructure
- Calculate public and private toilets needs

- Ending open defecation

 Most cost affordable or benefits maximized option

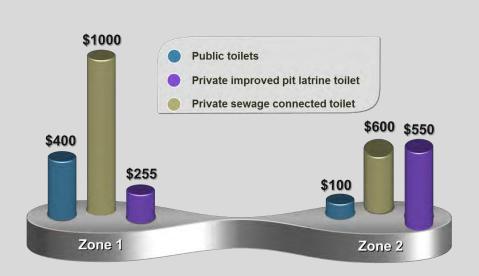


Scenarios

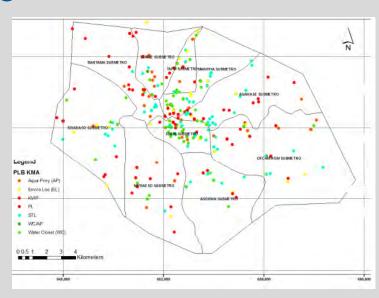
Output

- Toilet facility needs planning for improved <u>clean</u> sanitation
- Costs and benefits of improvement in sanitation

Use Case 6 - Toilet Infrastructure Increase availability of clean, accessible, and affordable toilet infrastructure



Fictitious example of suggested investment to more private/public toilets infrastructure



Akosah-Kusi, M., 2012. Provision of Spatial Data for Sanitation Planning: A Case of the Kumasi Metropolitan Area. 7th Annual Africa Geospatial Forum

Use Case Selection, Discussion, and Questions

Contact:

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Feedback on use cases

- Are these priorities for GAMA?
- Do any of the use cases need adjustment?
- Are there any other issues you might like to see addressed?



Ranking the use cases - process

On paper provided, rank each use case from 1-6 (1=strong, 6=poor) for the following evaluation criteria:

- a. Potential for useful indicators
- b. Priority of the issue for GAMA
- c. Potential added value resilience io could offer to address the issue

	Criteria a	Criteria b	Criteria c	Total score
Use case 1				
Use case 2				
Use case 3				
Use case 4				
Use case 5	- 1		11	
Use case 6				

Calculate the total score for all of the 6 use cases.

Put name and organisation on your feedback – pass to Catherine

