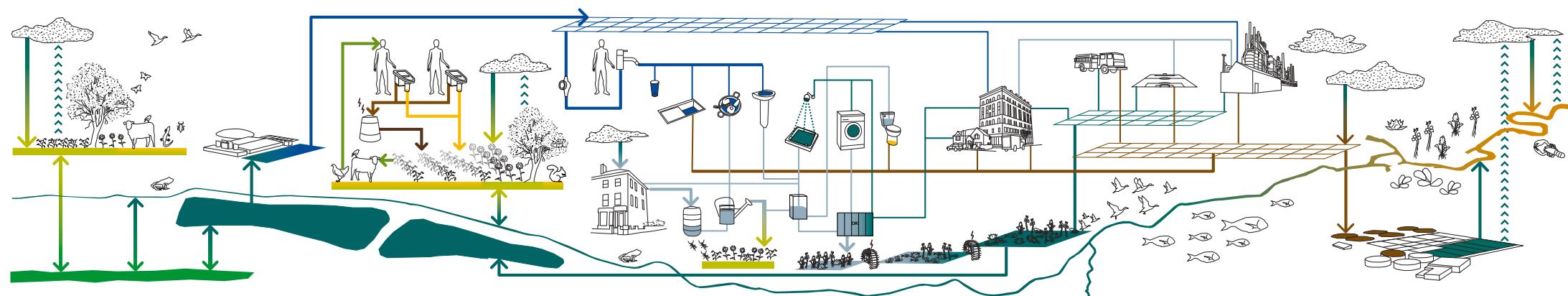


# Coevolving Greywater in London

Dr Tse-Hui Teh



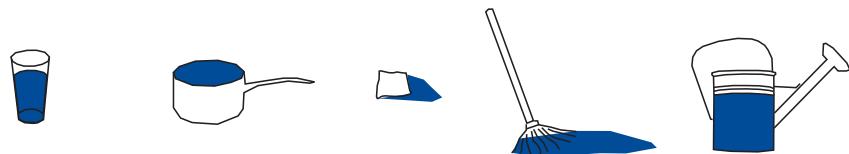
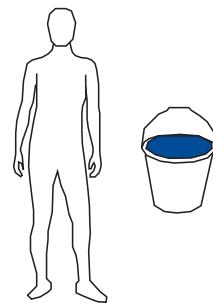
## Table of Contents

**Coevolutionary Actor-Network Theory**

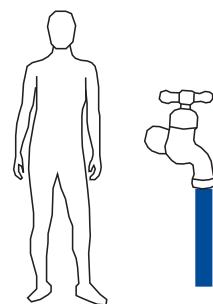
**Research methodology**

**Coevolving greywater**

**Conclusion**



**Technologies with hauled water supply**



**Technologies with piped water supply**

## **Coevolutionary Actor-Network Theory**

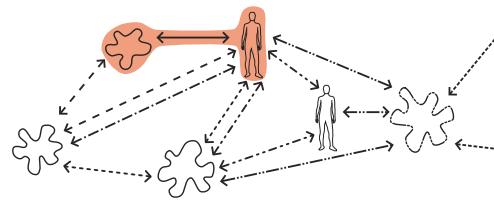
### **Shove, Geels**

Technologies and human values coevolve over time to form temporary stable networks of practices. A trajectory to changing networks.

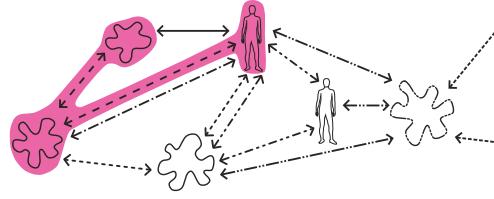
### **Callon & Latour**

5 stages to new network formation:

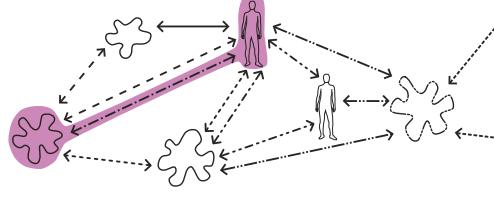
- Problematisation
- Interessement
- Enrolment
- Mobilisation
- Stabilisation (black box)



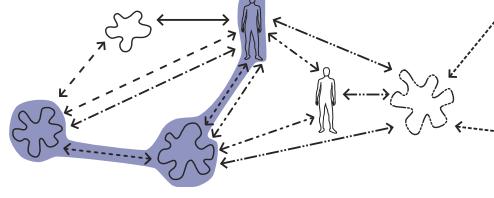
## Existing network relations



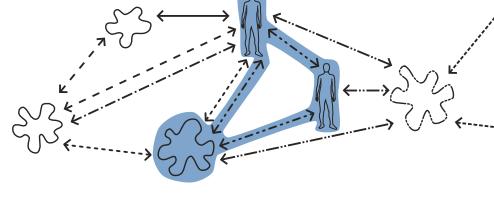
## New nonhumans Problematisation



## New network relations Interessement



## New nonhumans Problematisation, Interessement



## New network relations Interessement

## Methodology

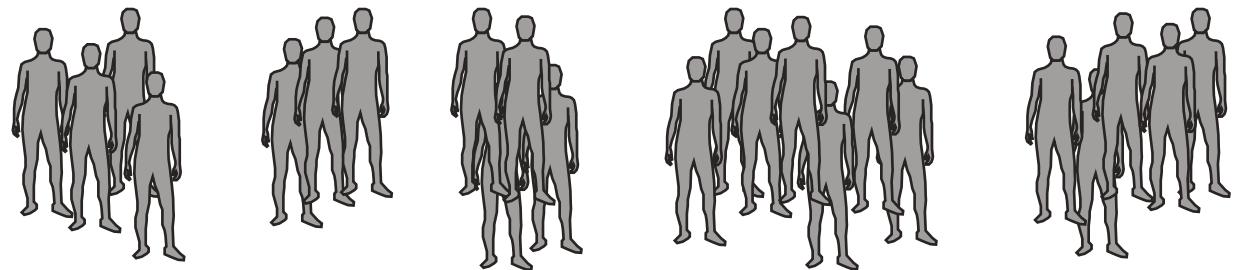
Understand the existing actor-network theory relations between humans and nonhumans creating the water system in London.

Use problematisation to find destabilised relations between actants (paths of probable coevolution).

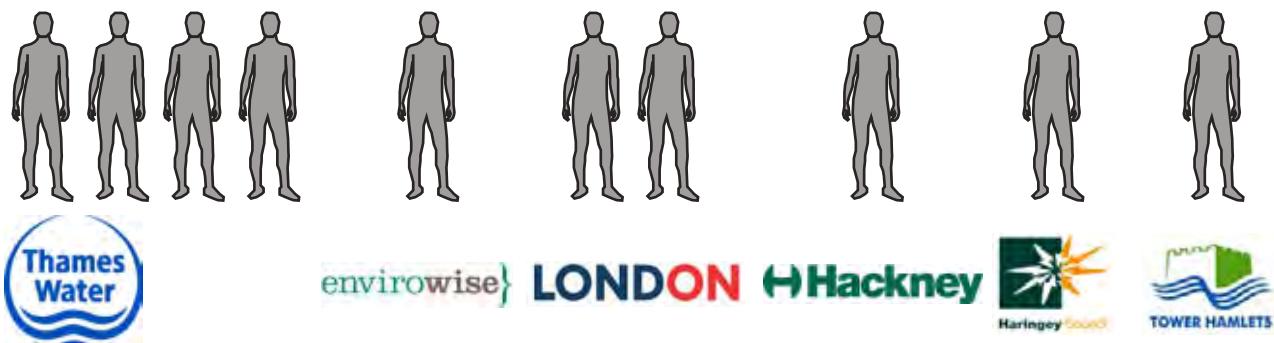
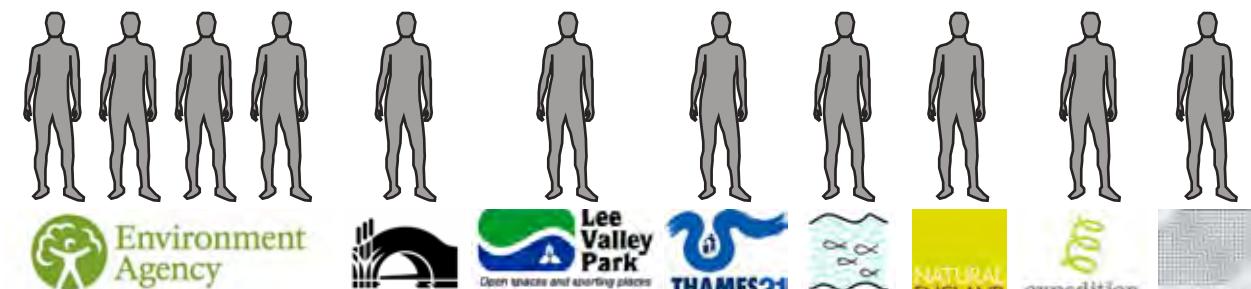
Test pathways of coevolution in an interactive process of design and discussion.

# Research Participants





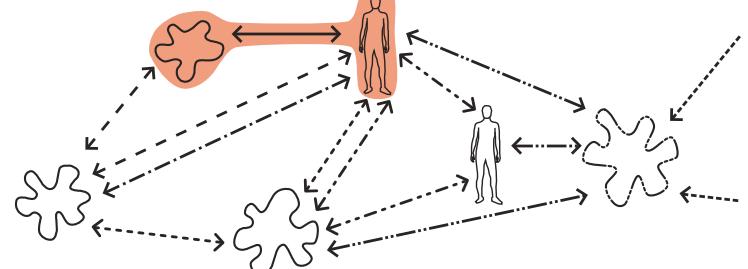
## Environmentally Aware Citizens



## Existing Networks

Investigating existing water-cycle configurations and anticipated change in times of flood and water scarcity of environmentally aware citizens and water professionals.

**Participants:** 30 environmentally aware citizens, 23 water professionals



Date	T/U	#	Description
23/07/09	T	1	Sink - Clean teeth + wash hands
"	T	2	Toilet
"	T	3	Shower - 5min timer + generator used.
"	T	4	Boil kettle + make a cup of tea.
"	T	5	water indoor basin + mint plant.
"	T	6	Load dishwasher + switch on (full load)
"	T	7	Go to work at Thames water
"	T	8	Carrying out my water efficiency work using computer + phone.
23/07/09	T	9	Wash cup + make a cup of tea + glass of water.
"	T	10	use toilet at work } <sup>x2</sup>
"	T	11	wash hands (push button) } <sup>108</sup>
"	T	12	Glass of squash (bought from tap at work)
"	T	13	Pint of Squash (at home)
"	T	14	1 litre bottle of squash for rowing
"	T	15	Rowing on the River Thames
"	T	16	Toilet @ home
23/07/09	T	17	wash hands
"	T	18	shower - 2 min.
"	T	19	cup of tea
"	T	20	Cook pasta in a saucepan of water
"	T	21	wash tomatoes in sink (plung)
"	T	22	Toilet
"	T	23	wash hands
"	T	24	brush teeth.
25/07/09	T	25	Load washing machine } <sup>x3</sup>
26/07/09	T	26	Wash apples in sink (with plug in)
26/07/09	U	27	Plant Lavendar in garden - with Mulching bark
"	U	28	Water lavender with watering can (4 x 13 litres)
"	U	29	Make cement for patio (mix bucket of water)
27/07/09	T	30	clean bathroom + rice away dirt with water.
"	T	31	clean kitchen + sink.
		32	

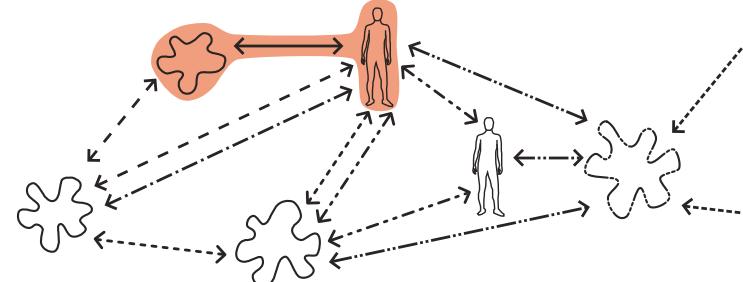
I did not include products used with embedded water (in production), but I know most things used every day will have used water in production (Food, household products etc).



## Existing Networks

**Water diary: record of nonhuman actants in daily water practices (35/45)**

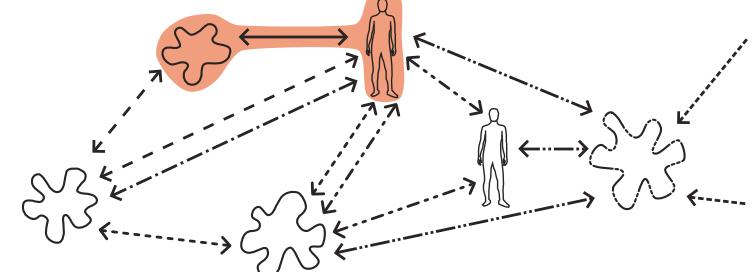
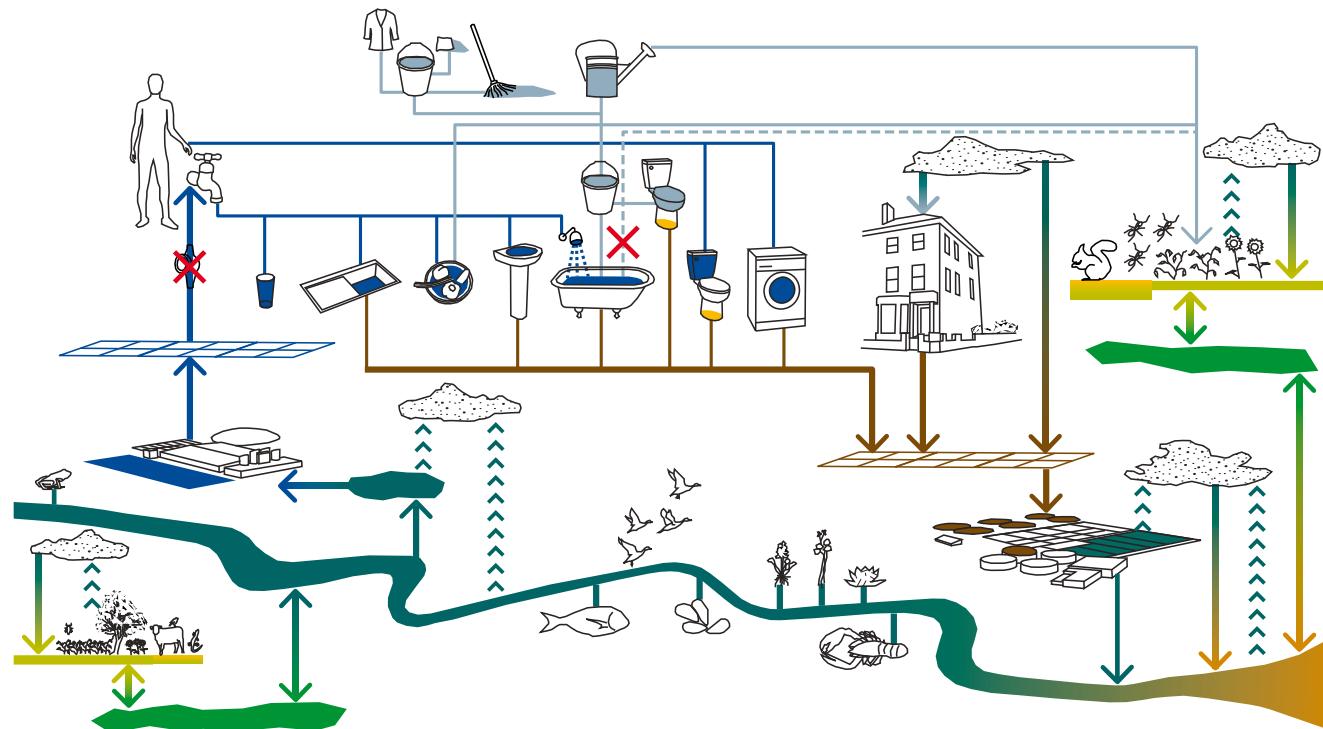
The three most photographed nonhumans were the tap and spout or mixer arrangement (180); the basin (108); and the toilet (78).



## Greywater Use

Reusing water using existing technologies.

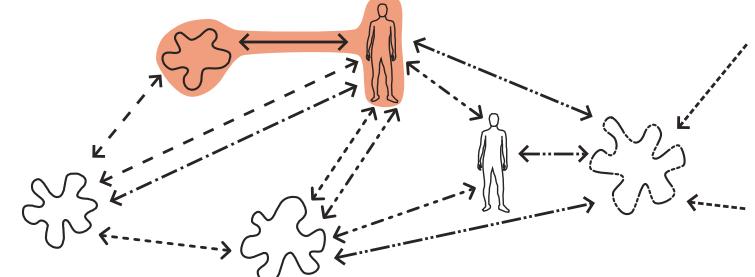
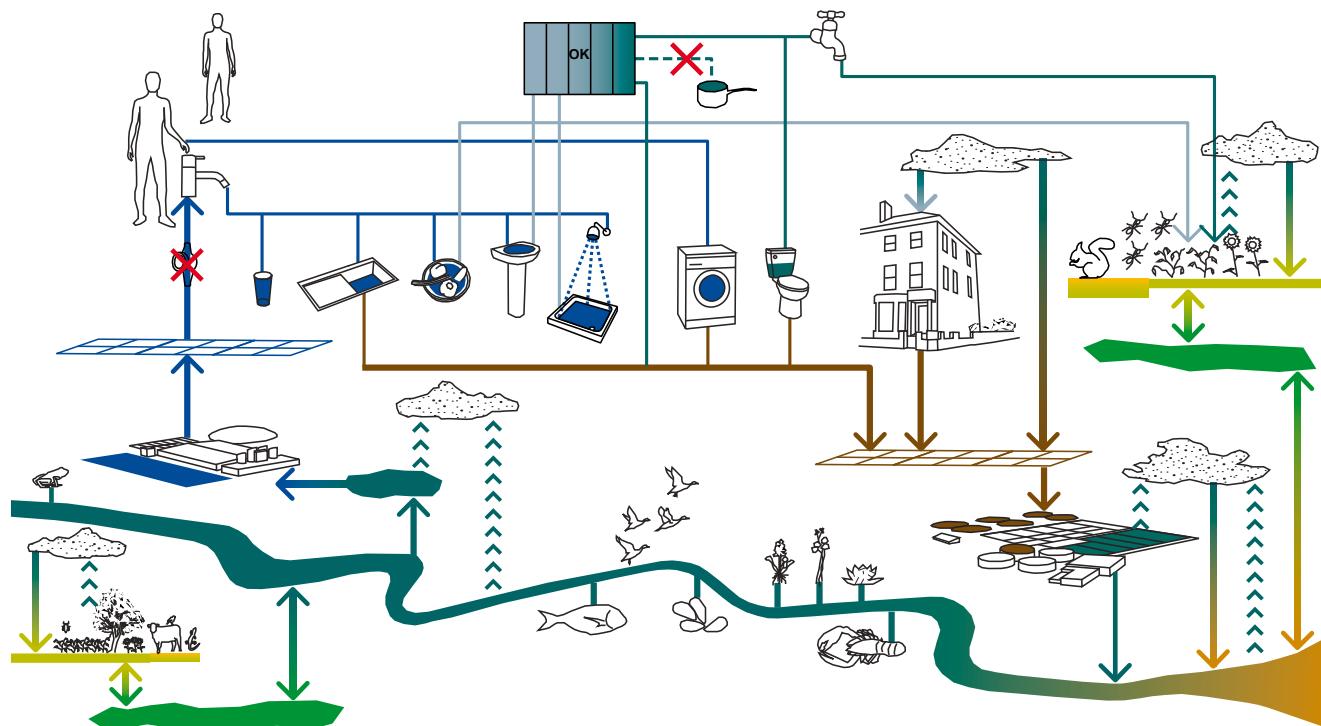
Lots of visual feedback about amount of water used, reused and saved.



# Greywater Use

Reusing water using new technologies.

Very little feedback about the amount of water used, reused and saved.





WASH UP BOWL

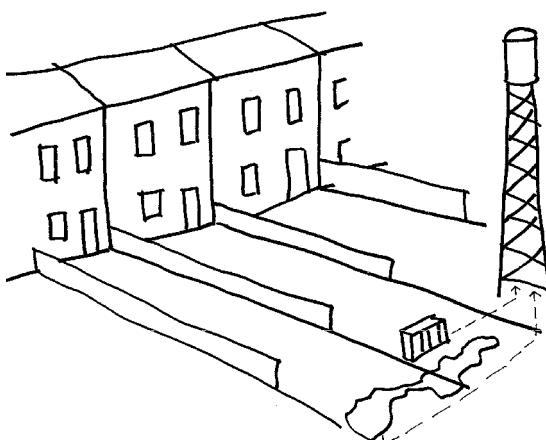


WASH UP BOWL  
WITH LID  
-TOILET FLUSH  
-GARDEN  
-HOUSE CLEANING  
-BIKE CLEANING

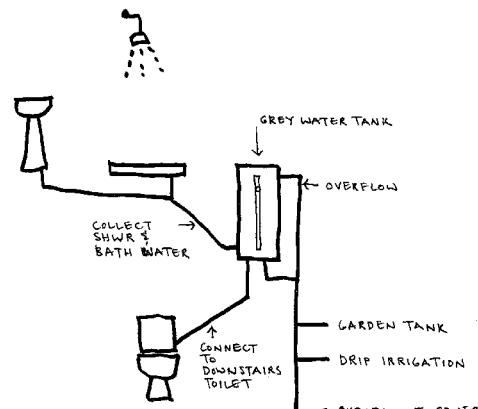


WASH UP BOWL  
WITH SPOUT  
-HOUSE PLANTS  
-OUT DOOR POTS;  
HANGING BASKETS  
-GARDEN

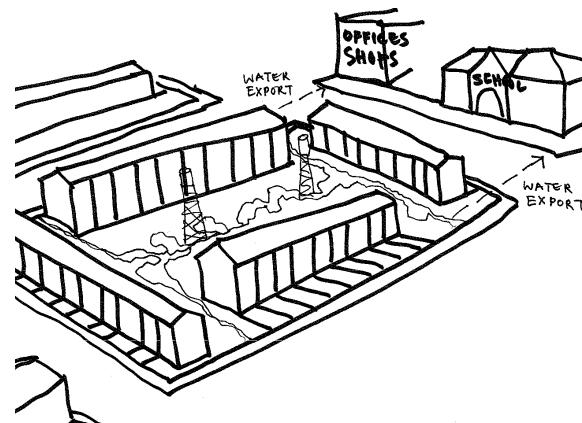
**Individual  
Immediate**



**Collective  
50-75 years**



**Individual  
10 years**

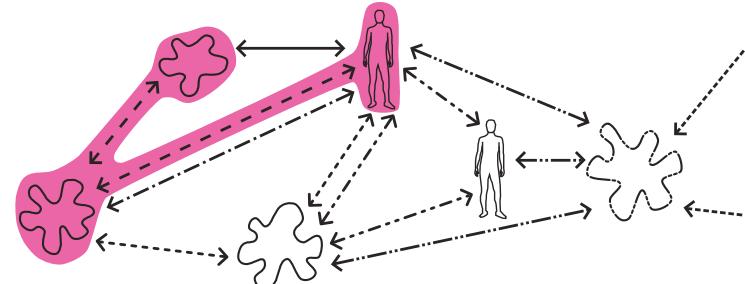


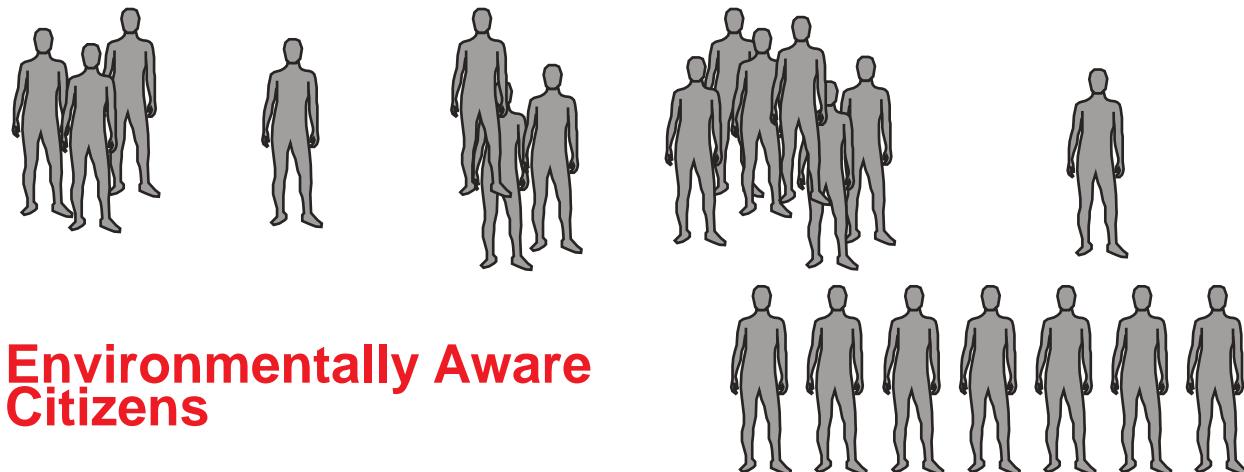
**Community  
100 years**

## Coevolving Nonhumans

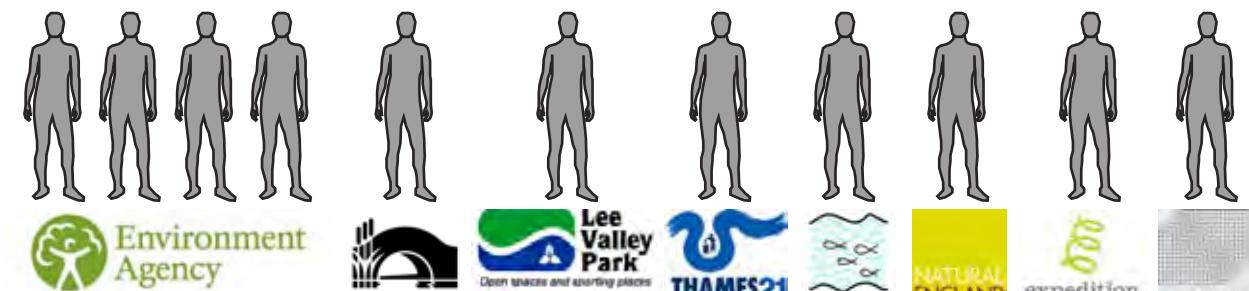
Using unique water practices and anticipated changes to water practices in times of water scarcity to create possible networks of nonhumans.

These design changes occurred at an immediate timescale, 10 years, 50-75 years, and 100 years.





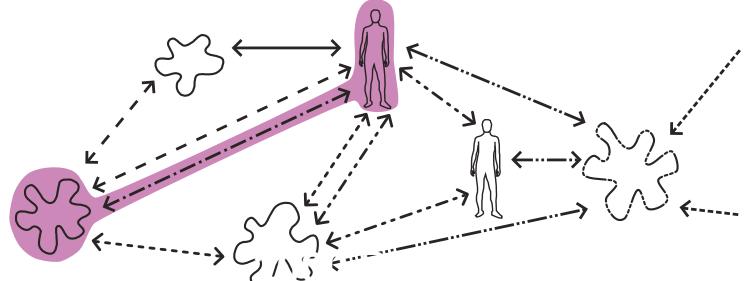
## Environmentally Aware Citizens



## Interview and Group Discussion 2

**Participants:** 43/53 of previous participants returned for the second stage.

21 environmentally aware citizens, 20 water professionals.





WASH UP BOWL

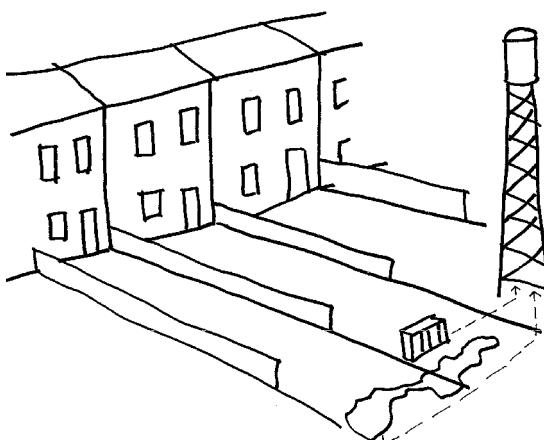


WASH UP BOWL  
WITH LID  
-TOILET FLUSH  
-GARDEN  
-HOUSE CLEANING  
-BIKE CLEANING

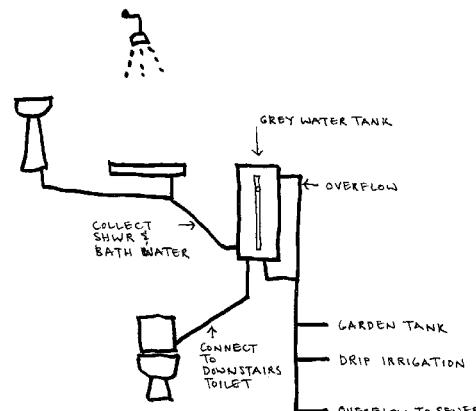


WASH UP BOWL  
WITH SPOUT  
-HOUSE PLANTS  
-OUT DOOR POTS;  
HANGING BASKETS  
-GARDEN

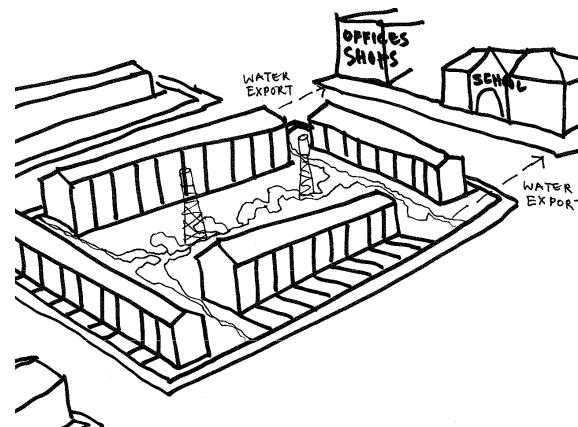
**Individual  
Immediate**



**Collective  
50-75 years**



**Individual  
10 years**



**Community  
100 years**

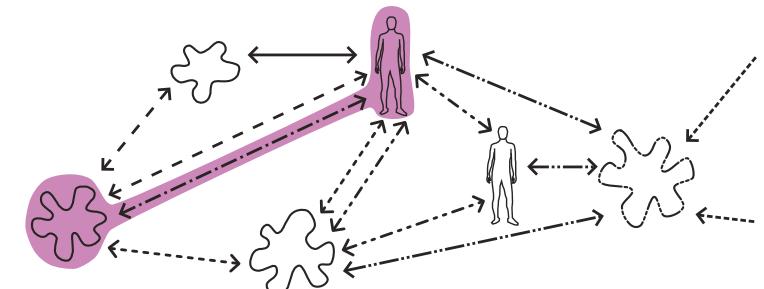
## Coevolving Humans

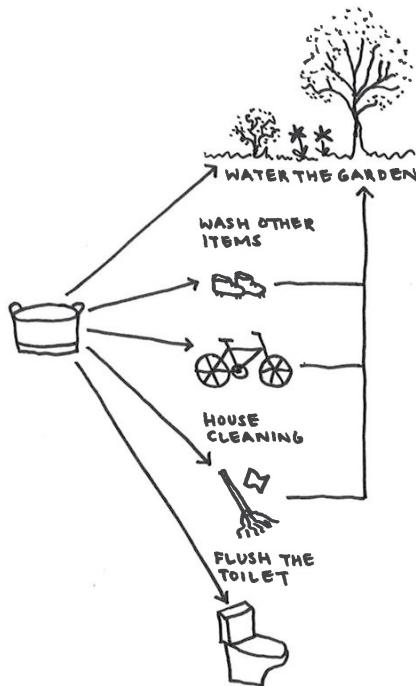
### Interessement:

- Washup bowl
- Greywater tank
- Community greywater treatment and reuse

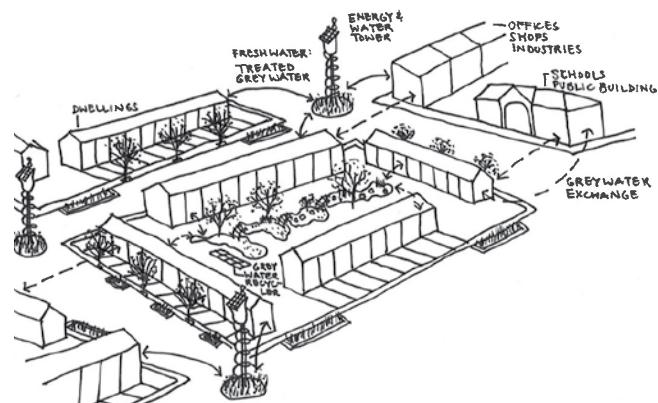
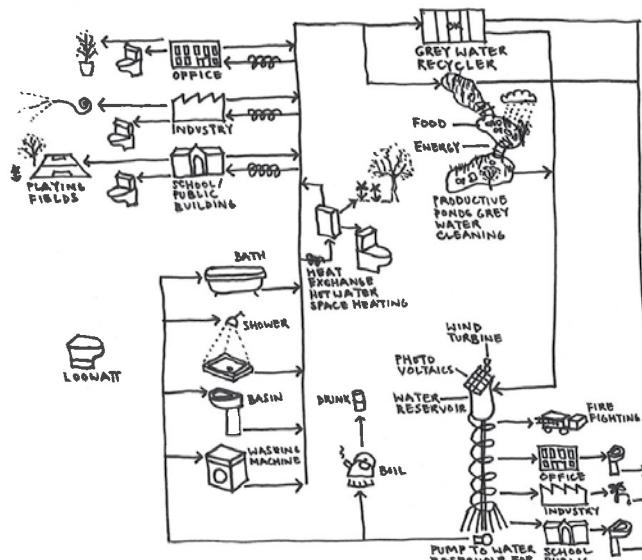
### No Interessement:

- Neighbours in a collective





**Take Away Sink**  
Jessica Nebel, RCA

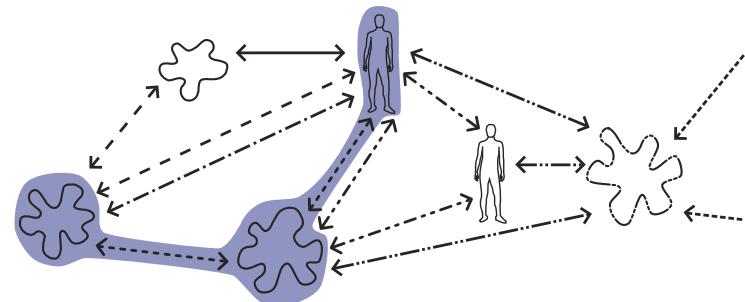


**Polyculture Reuse Community**

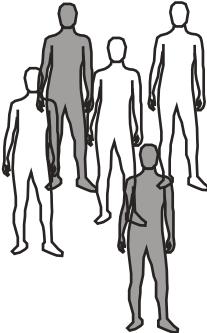
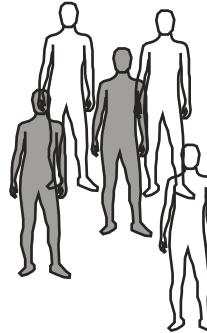
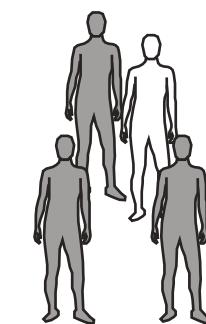
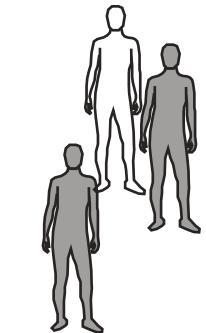
## Coevolving Nonhumans

Using the interessement relations from the previous interviews and group discussions to develop more elaborate actant relations.

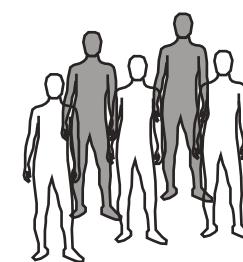
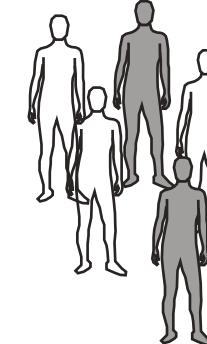
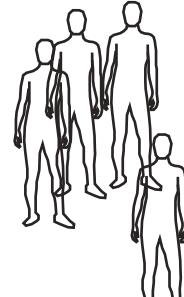
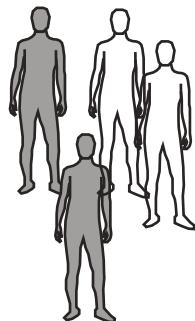
These design changes occurred only at an immediate timescale.



## Environmentally Aware Citizens



## Environmentally Aware Citizens



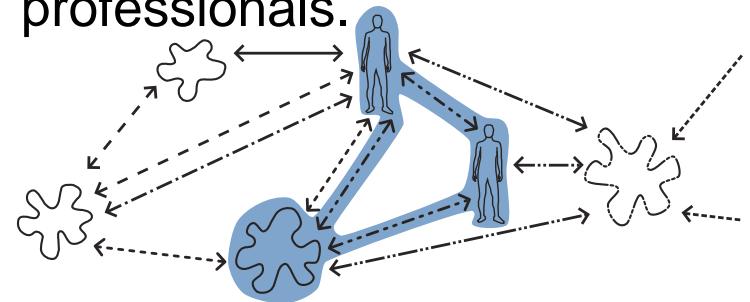
## Interview and Group Discussion 3

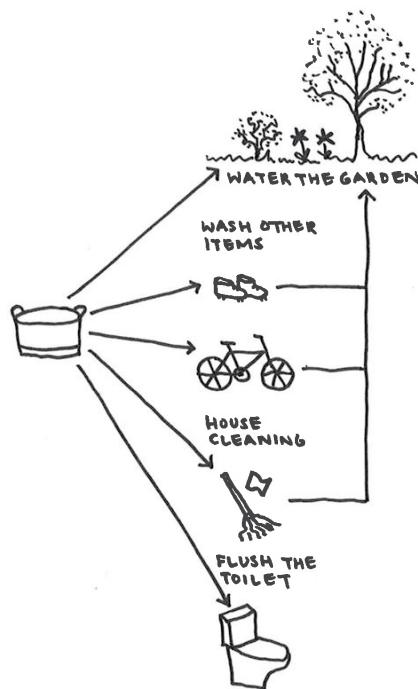
**Participants:** 27

environmentally aware citizens, 8 water professionals.

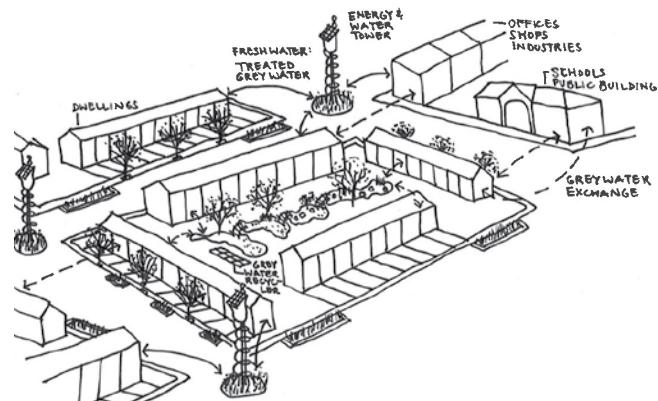
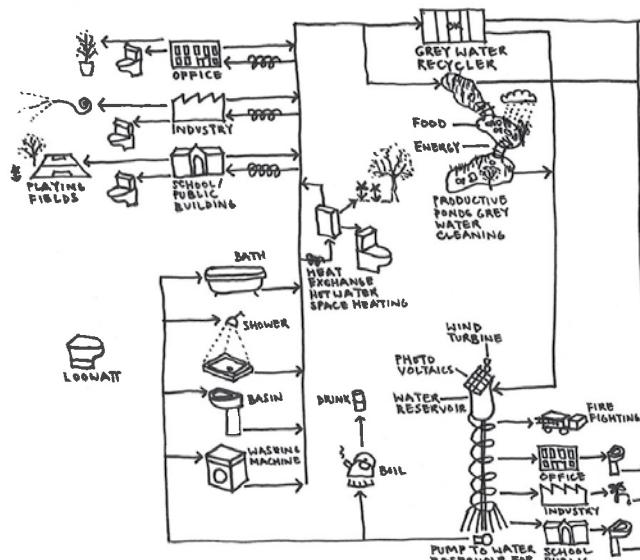
16 people participated in all three stages

**19 new participants:**  
17 environmentally aware citizens, 2 water professionals.





**Take Away Sink**  
Jessica Nebel, RCA



**Polyculture Reuse Community**

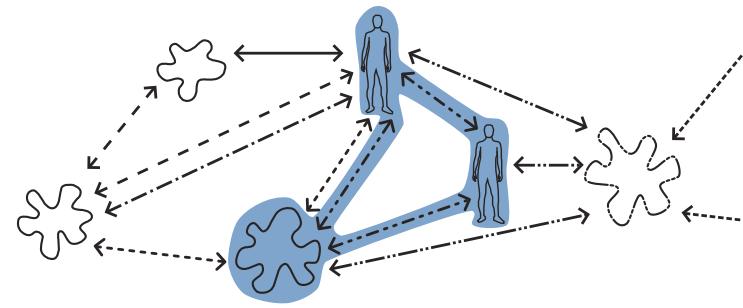
## Coevolving Humans

### Interessement:

- Take Away Sink
- Polyculture reuse community

Saturation point, no additional actants nor interessement.

Limits to interessement using a design actant.





## Conclusion

Coevolutionary Actor-Network Theory can be successfully combined to shift these theoretical frameworks from historic assemblies to test projective coevolutionary networks.



2015 Take Away Sink, Debenhams