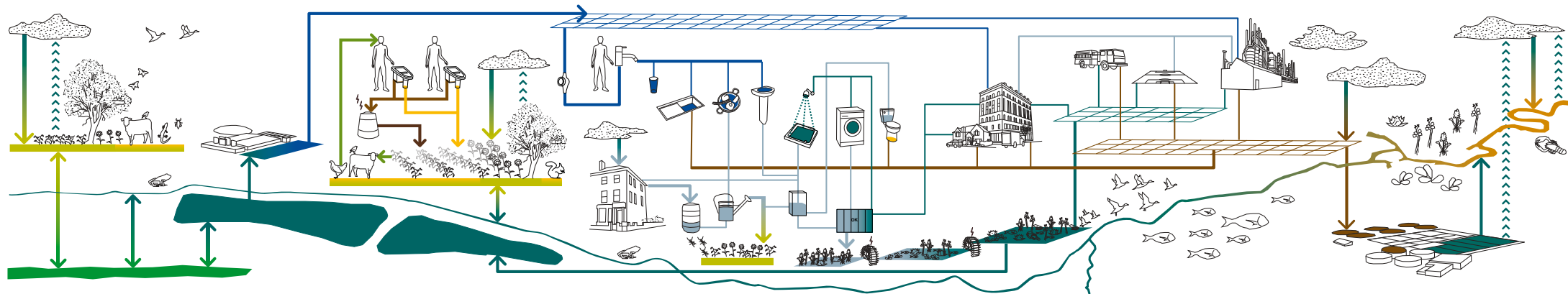


# Coevolving Greywater in London

Dr Tse-Hui Teh



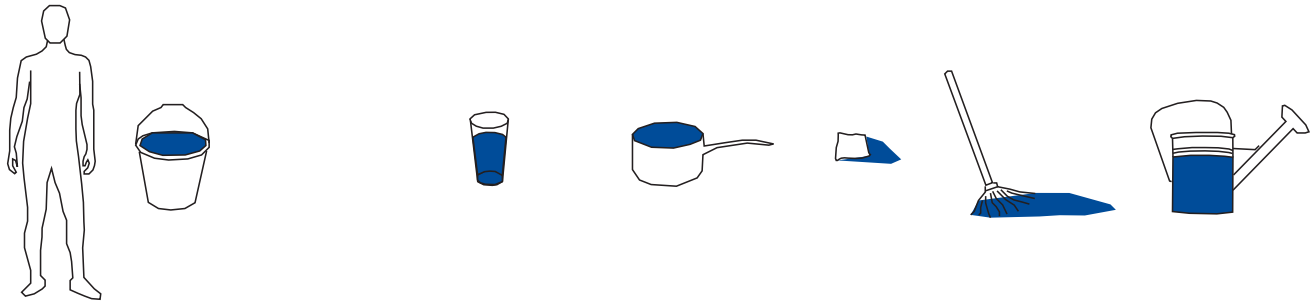
# **Table of Contents**

**Coevolutionary Actor-Network Theory**

**Research methodology**

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**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:

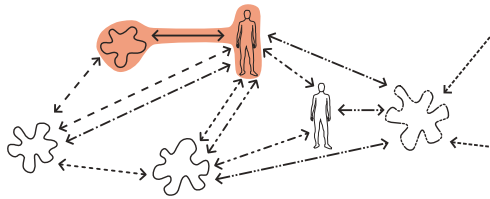
Problemmatisation

Interressement

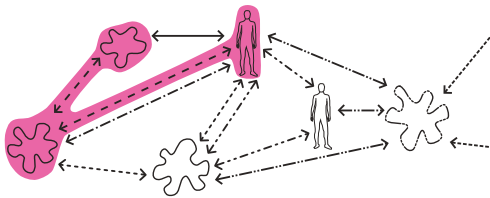
Enrolment

Mobilisation

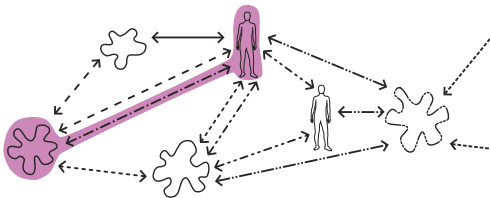
Stabilisation (black box)



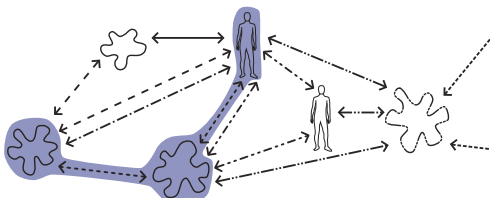
## Existing network relations



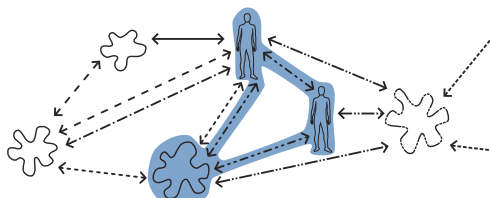
## New nonhumans Problematism



## New network relations Interessement



## New nonhumans Problematism, Interessement



## New network relations Interessement

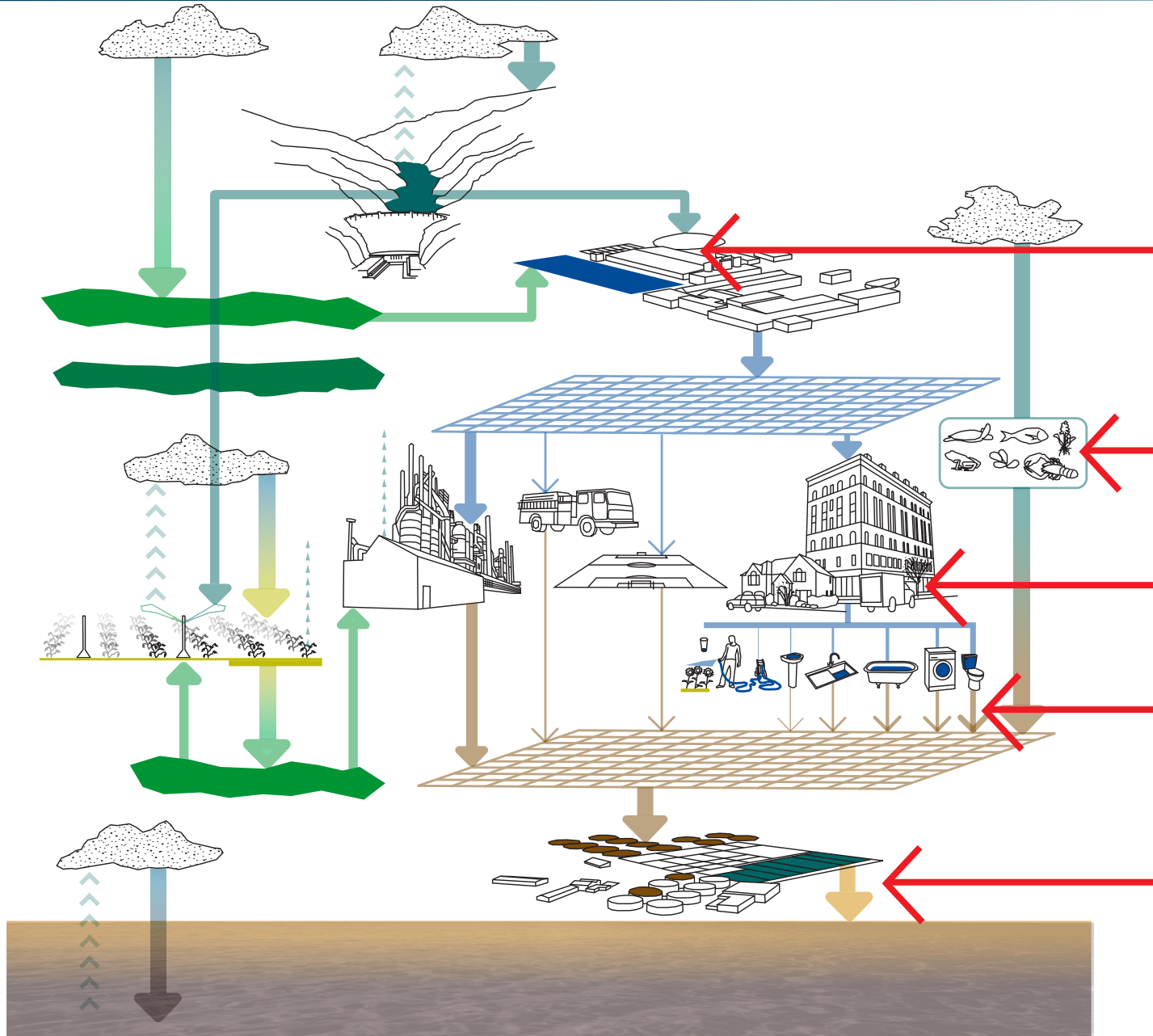
## Methodology

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

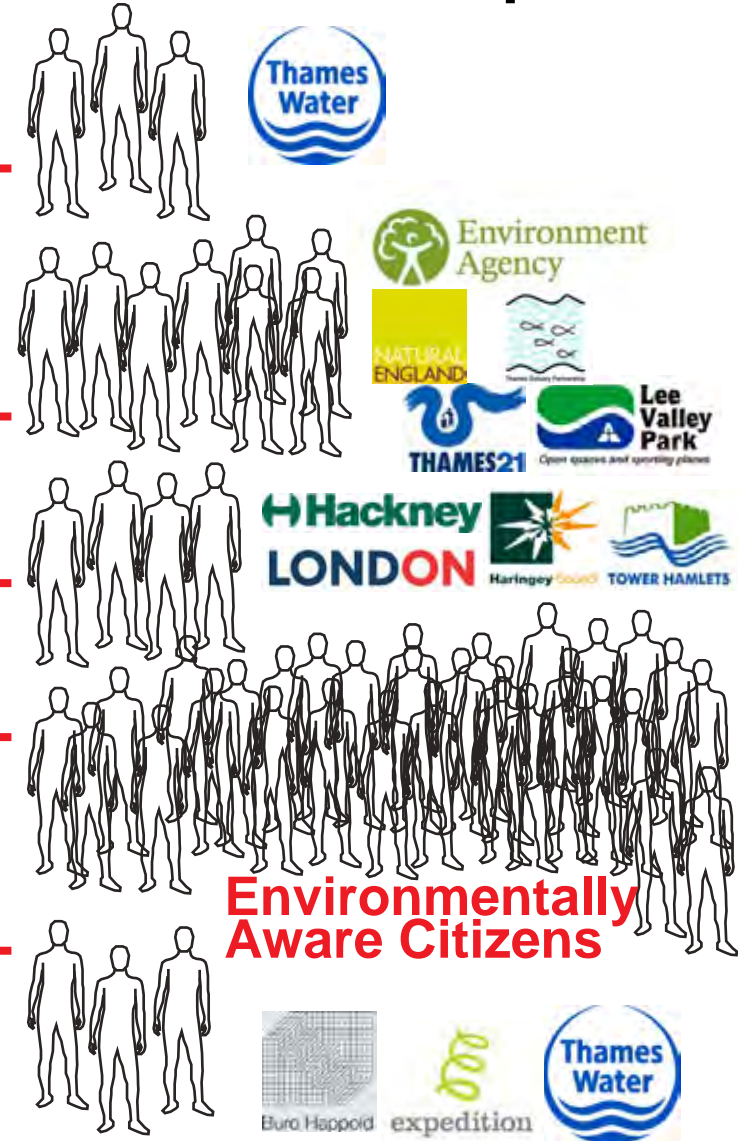
Use problematisation to find destabilised relations between actants (paths of probable coevolution).

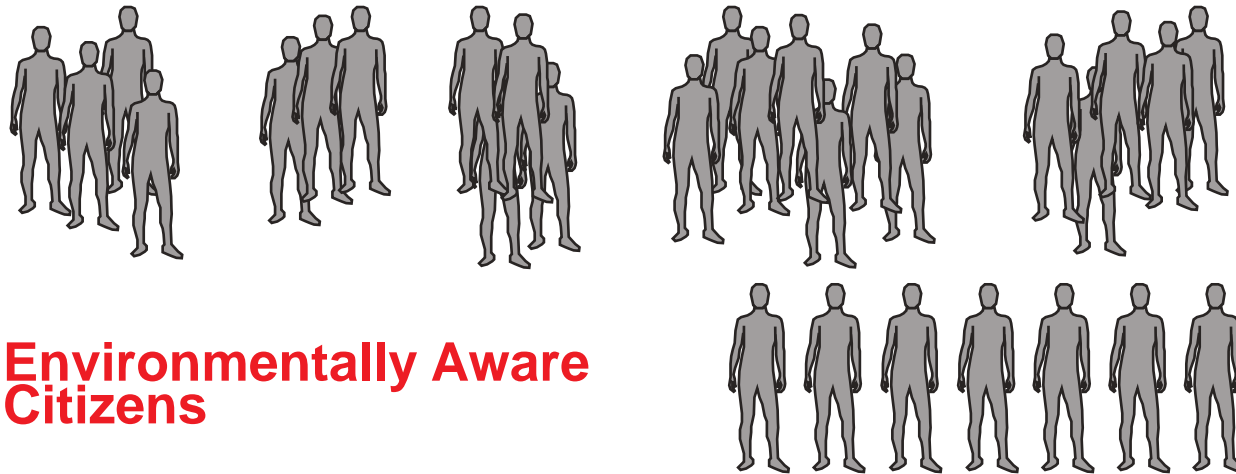
Test pathways of coevolution in an iterative process of design and discussion.





## Research Participants





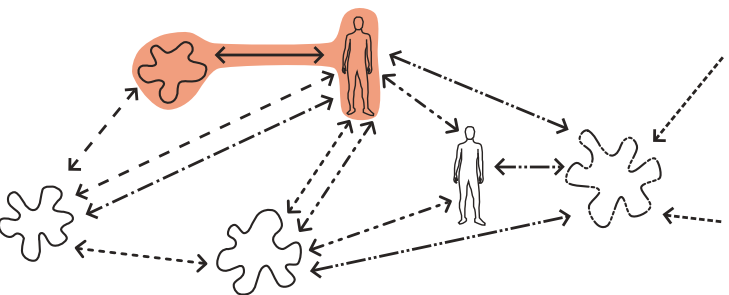
## Environmentally Aware Citizens



## 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 + aerator used
"	T	4	Boil kettle + make a cup of tea
"	T	5	Water indoor basil + 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
"	T	11	Wash hands (push button)
"	T	12	Glass of squash (water from tap)
"	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 (plug)
"	T	22	Toilet
"	T	23	Wash hands
"	T	24	Brush teeth.
25/07/09	T	25	Load washing machine x3
26/07/09	T	26	Wash apples in sink. (with plug in)
26/07/09	U	27	Plant lavender in garden - with mulching (bark)
"	U	28	Water lavender with watering can (4x 13 litres)
"	U	29	Make cement for patio (use buckets of water)
27/07/09	T	30	Clean bathroom + rice away dirt with water.
"	T	31	Clean kitchen + sink.
		32	

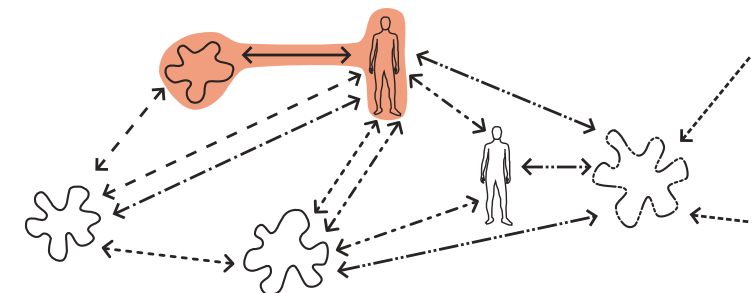
I did not include products used with embedded water (in production), but I know most things used every day will have used water in production (Food, household products etc).



## 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).

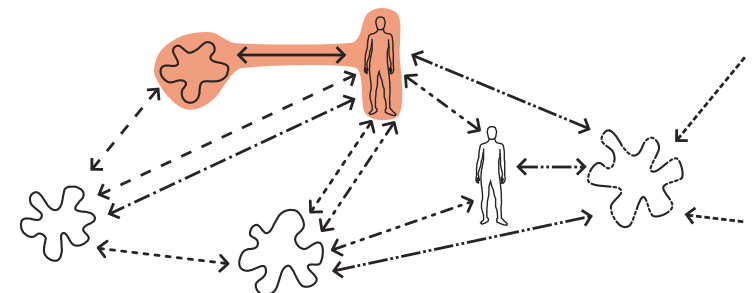
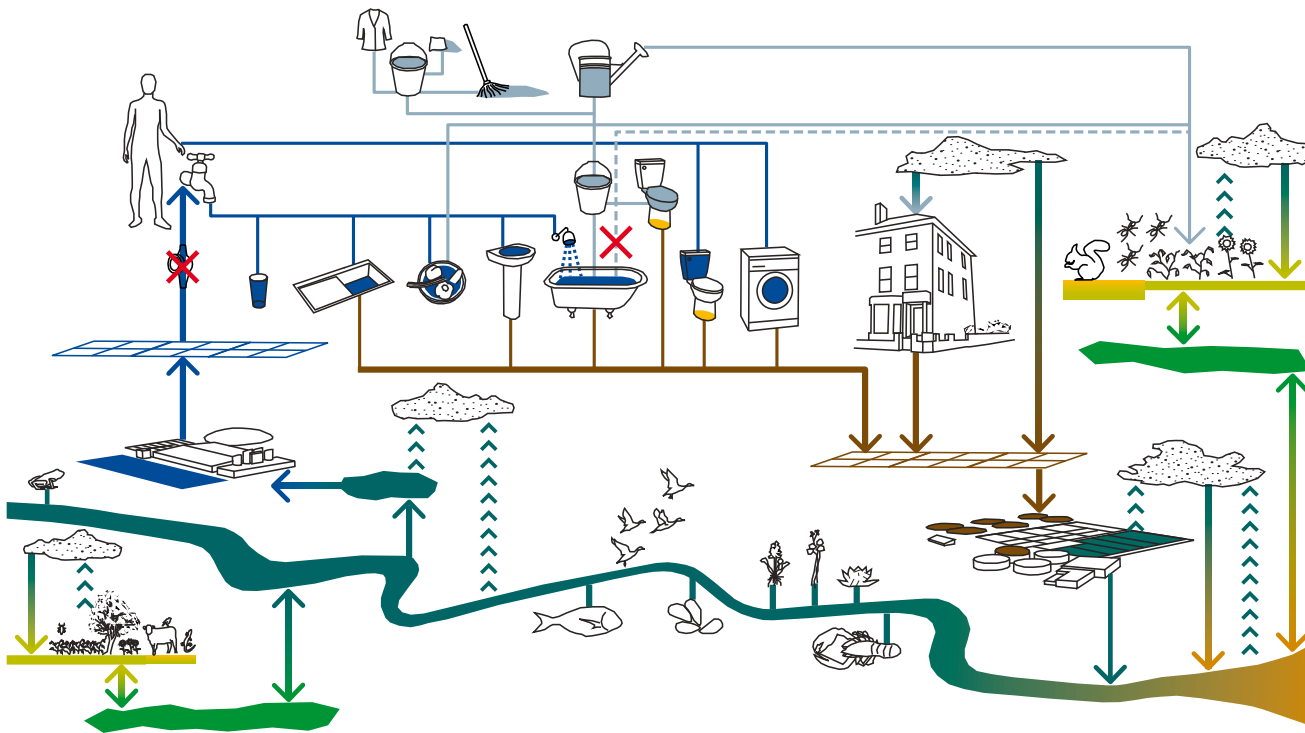




## Greywater Use

Reusing water using existing technologies.

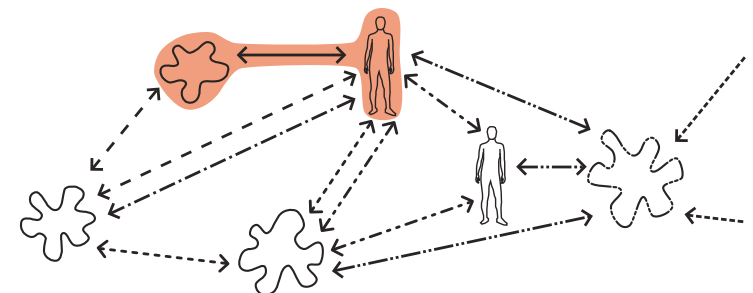
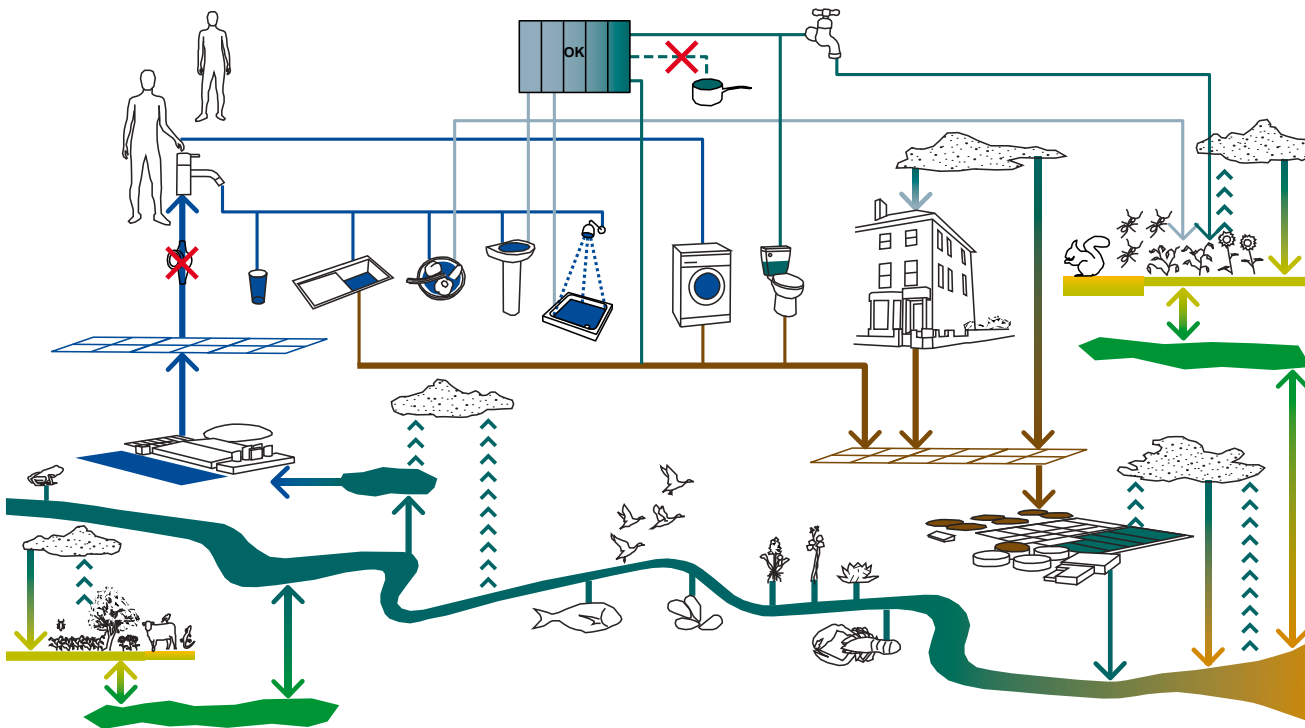
Lots of visual feedback about amount of water used, reused and saved.

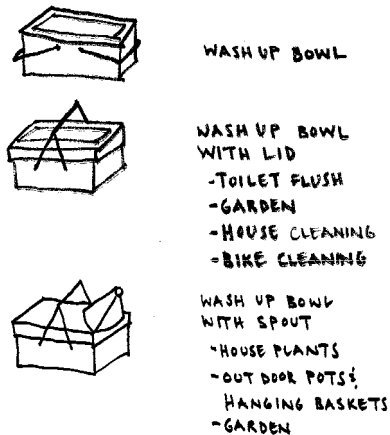


## Greywater Use

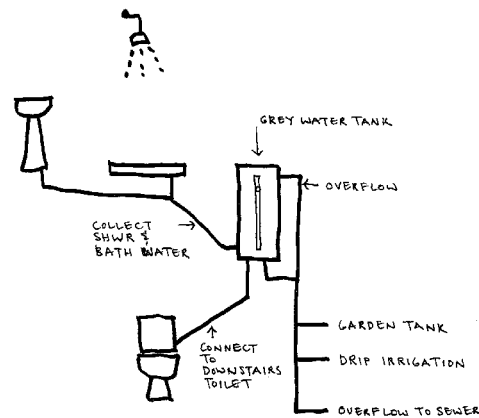
Reusing water using new technologies.

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

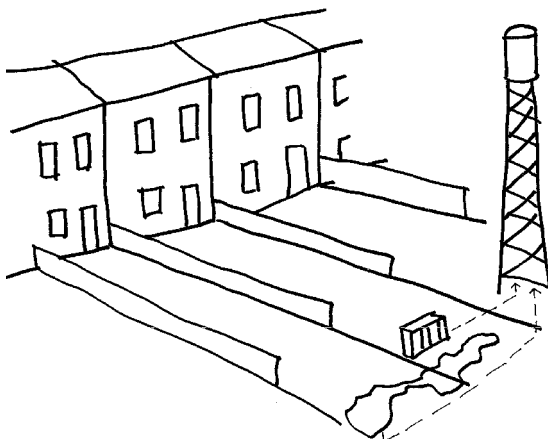




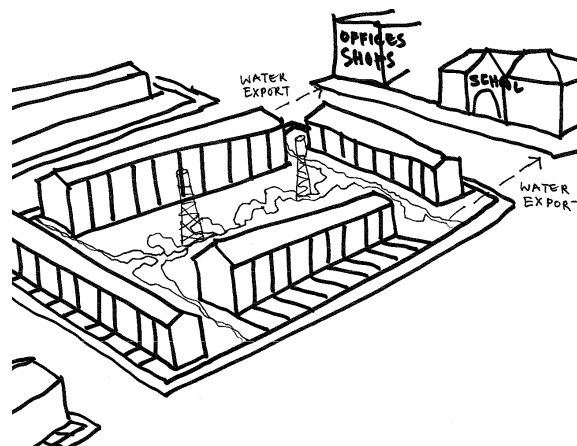
**Individual  
Immediate**



**Individual  
10 years**



**Collective  
50-75 years**

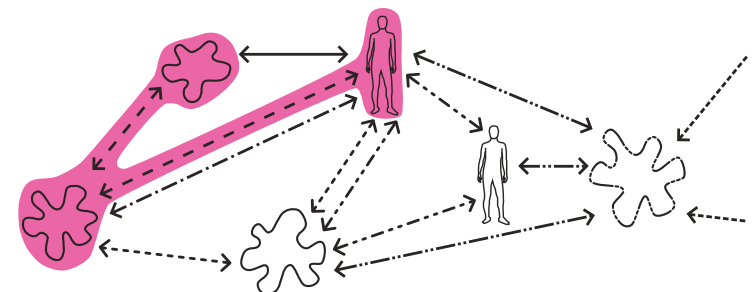


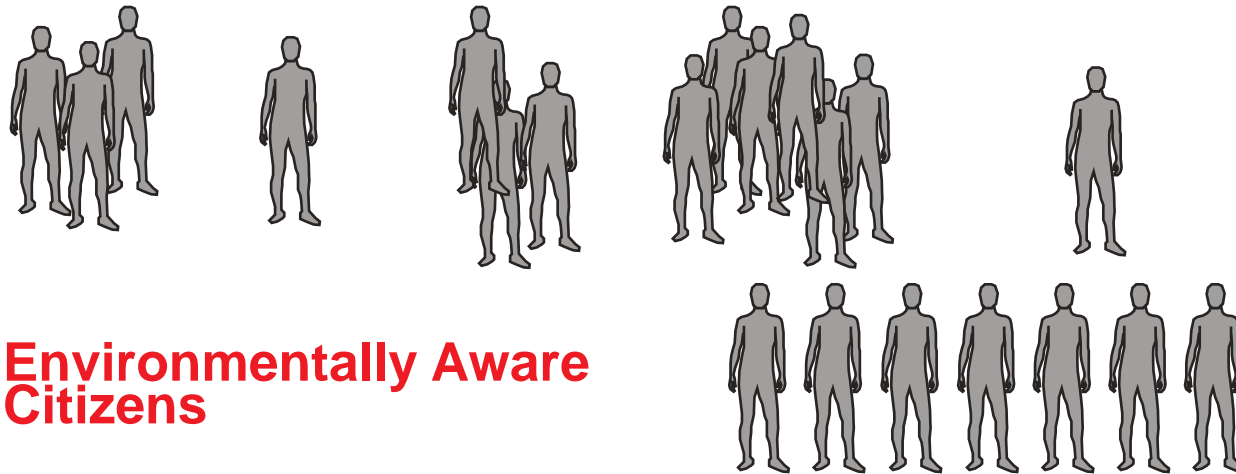
**Community  
100 years**

## 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.





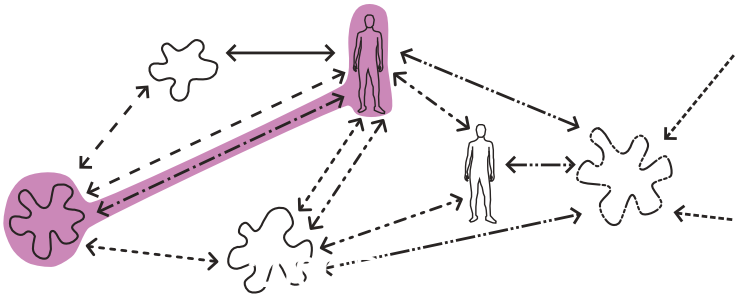
**Environmentally Aware Citizens**

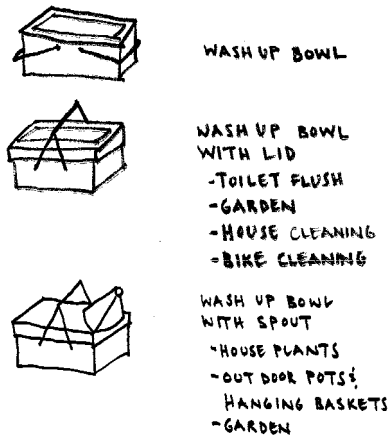


# Interview and Group Discussion 2

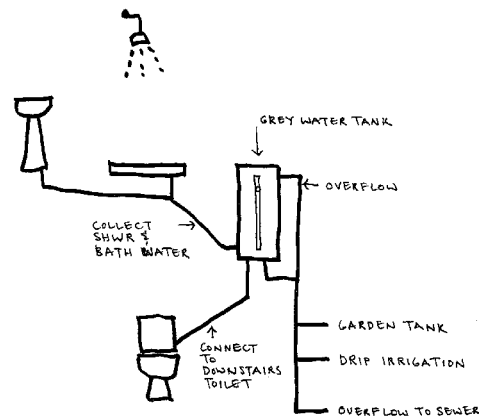
**Participants:** 43/53 of previous participants returned for the second stage.

21 environmentally aware citizens, 20 water professionals.

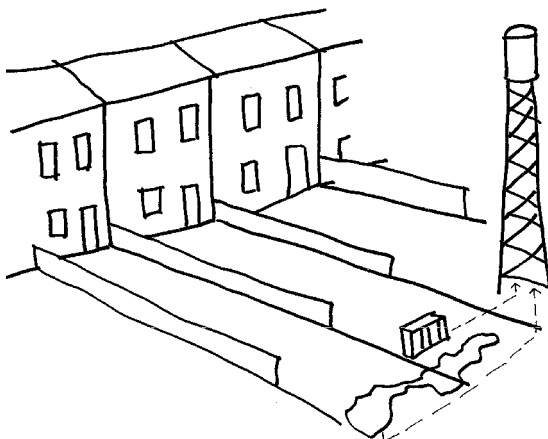




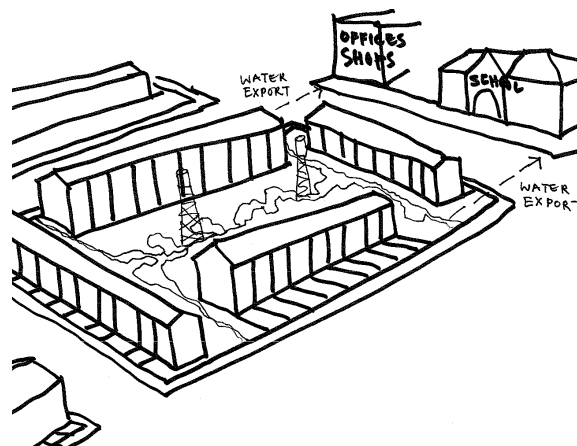
**Individual  
Immediate**



**Individual  
10 years**



**Collective  
50-75 years**



**Community  
100 years**

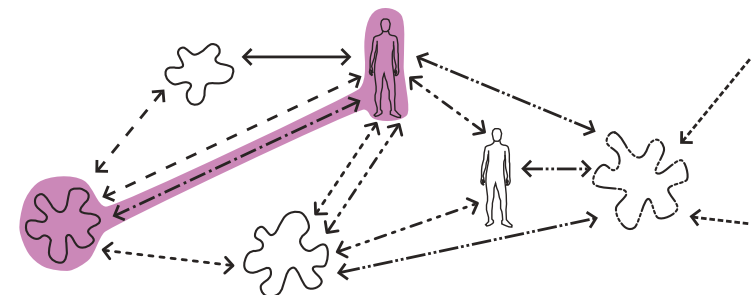
## Coevolving Humans

### Interessement:

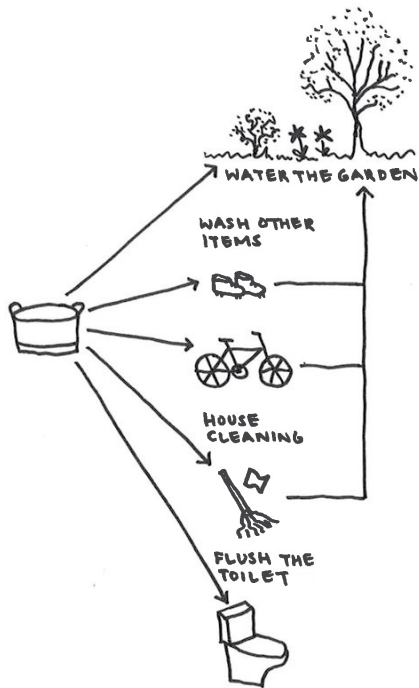
- Washup bowl
- Greywater tank
- Community greywater treatment and reuse

### No Interessement:

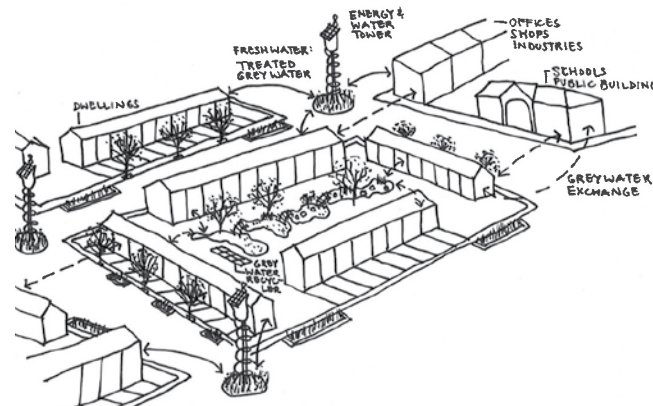
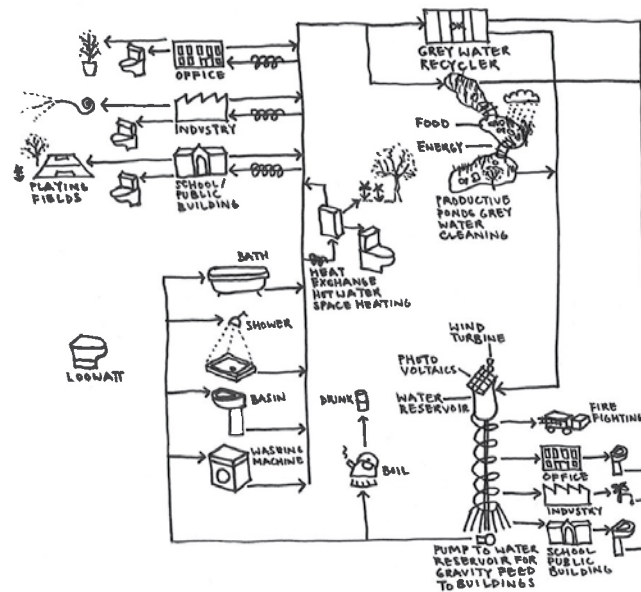
- Neighbours in a collective







**Take Away Sink**  
Jessica Nebel, RCA

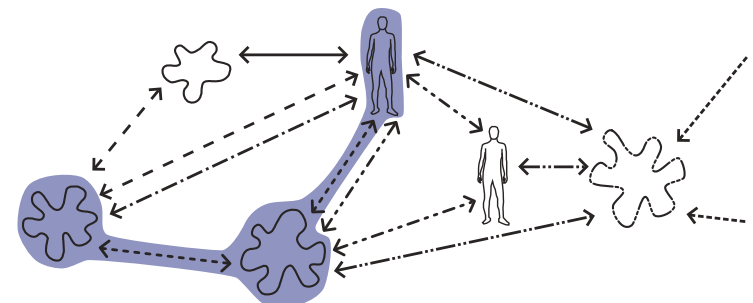


**Polyculture Reuse Community**

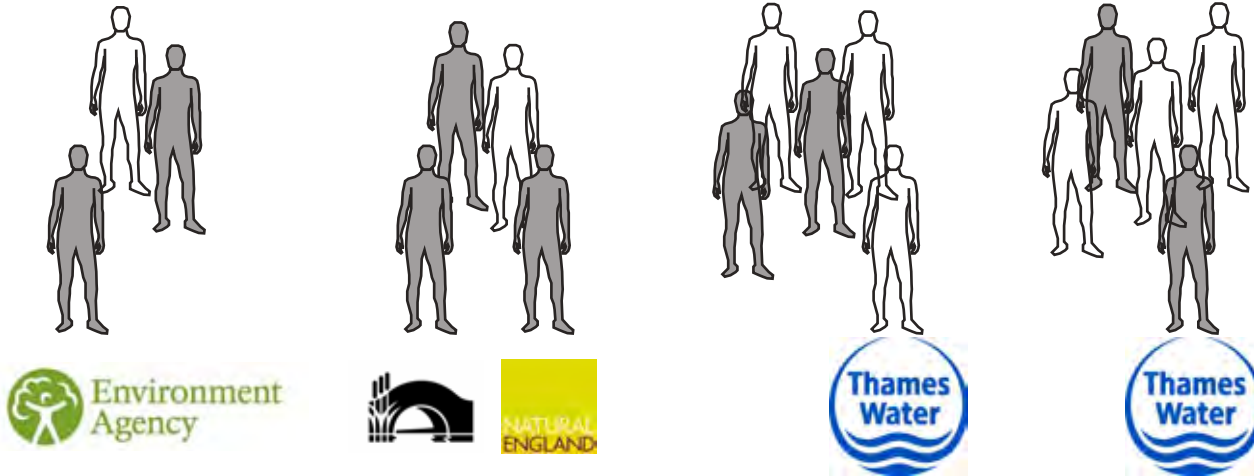
## Coevolving Nonhumans

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

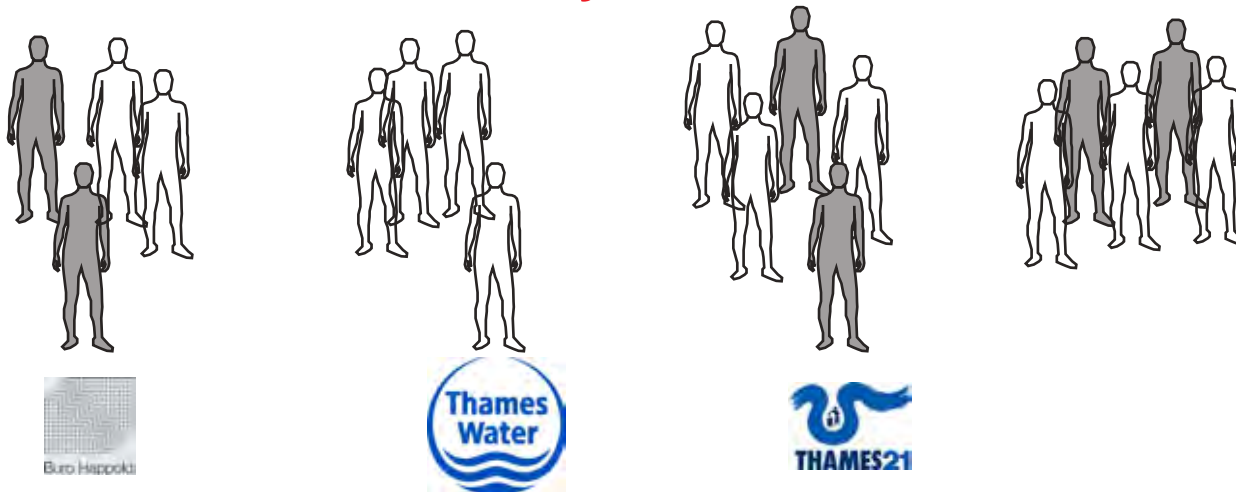
These design changes occurred only at an immediate timescale.



## Environmentally Aware Citizens



## Environmentally Aware Citizens

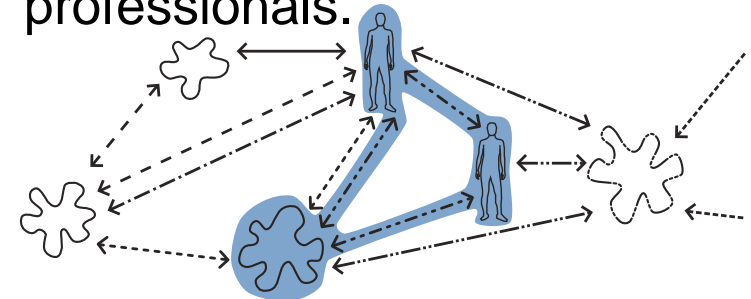


## Interview and Group Discussion 3

**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.



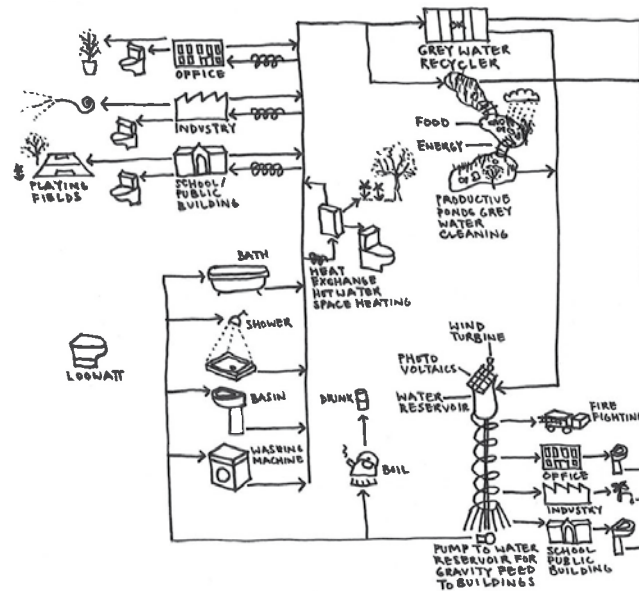
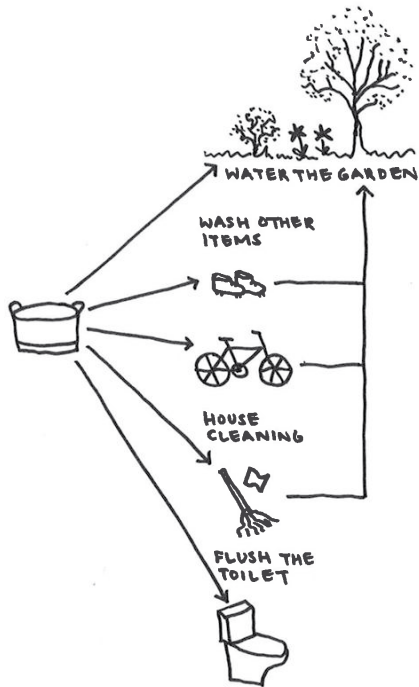
# Coevolving Humans

## Interessement:

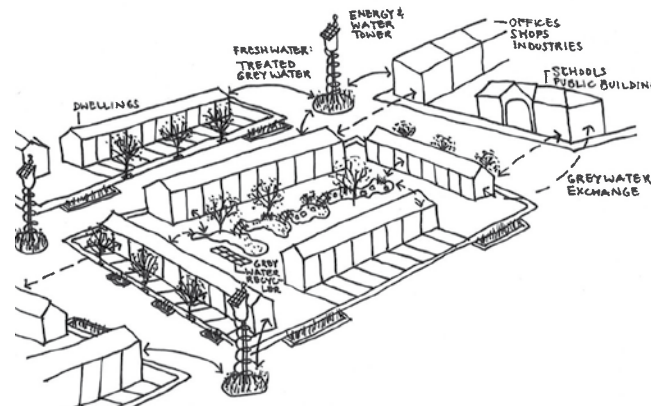
- Take Away Sink
- Polyculture reuse community

Saturation point, no additional actants nor interessement.

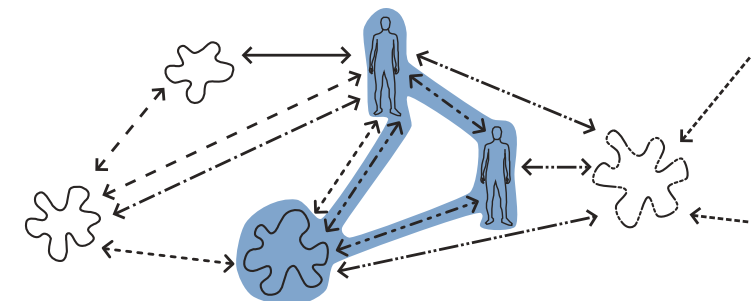
Limits to interessement using a design actant.



**Take Away Sink**  
Jessica Nebel, RCA



**Polyculture Reuse Community**







## 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