New approaches in Foresight methodology

Higher School of Economics
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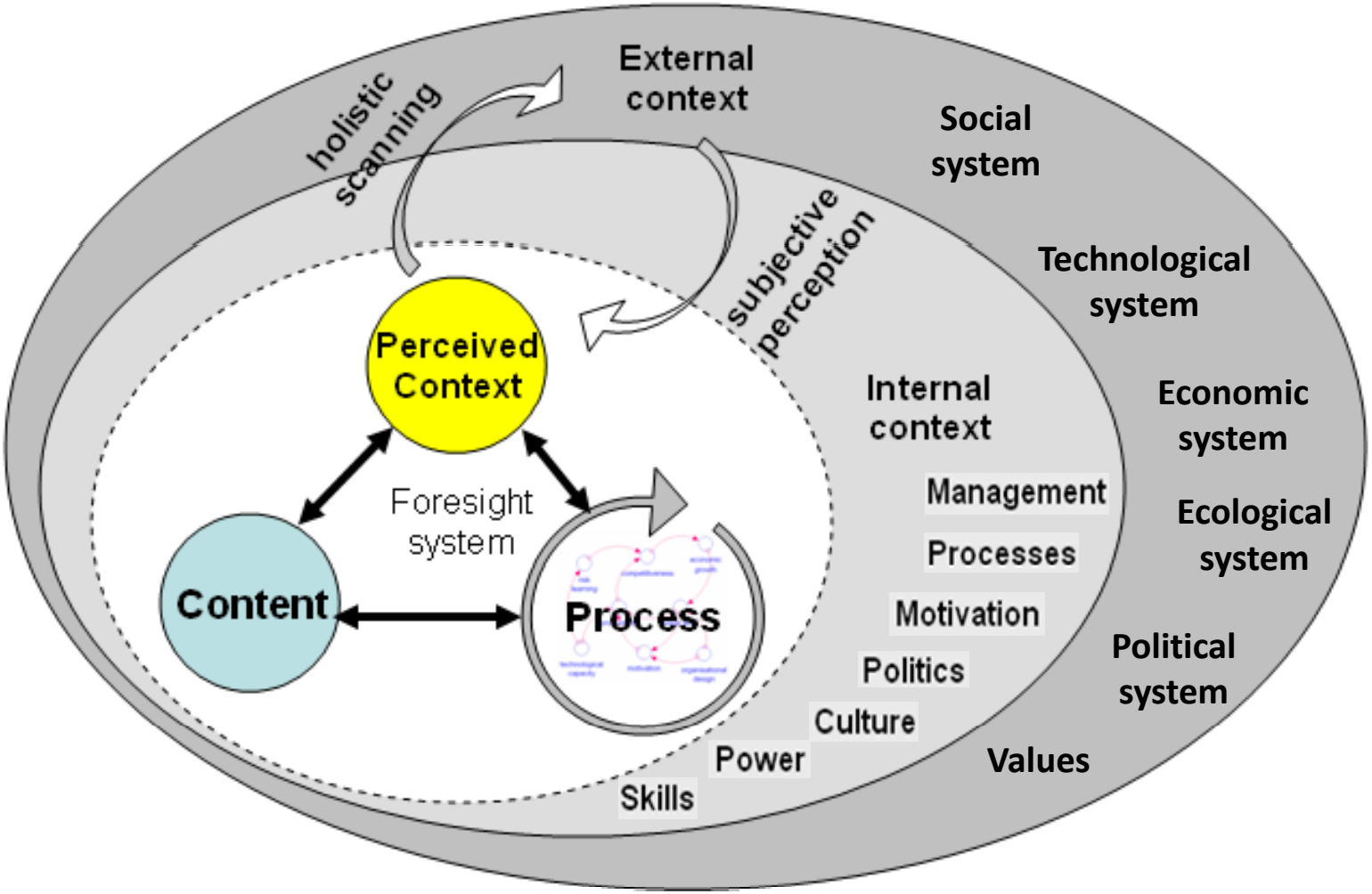
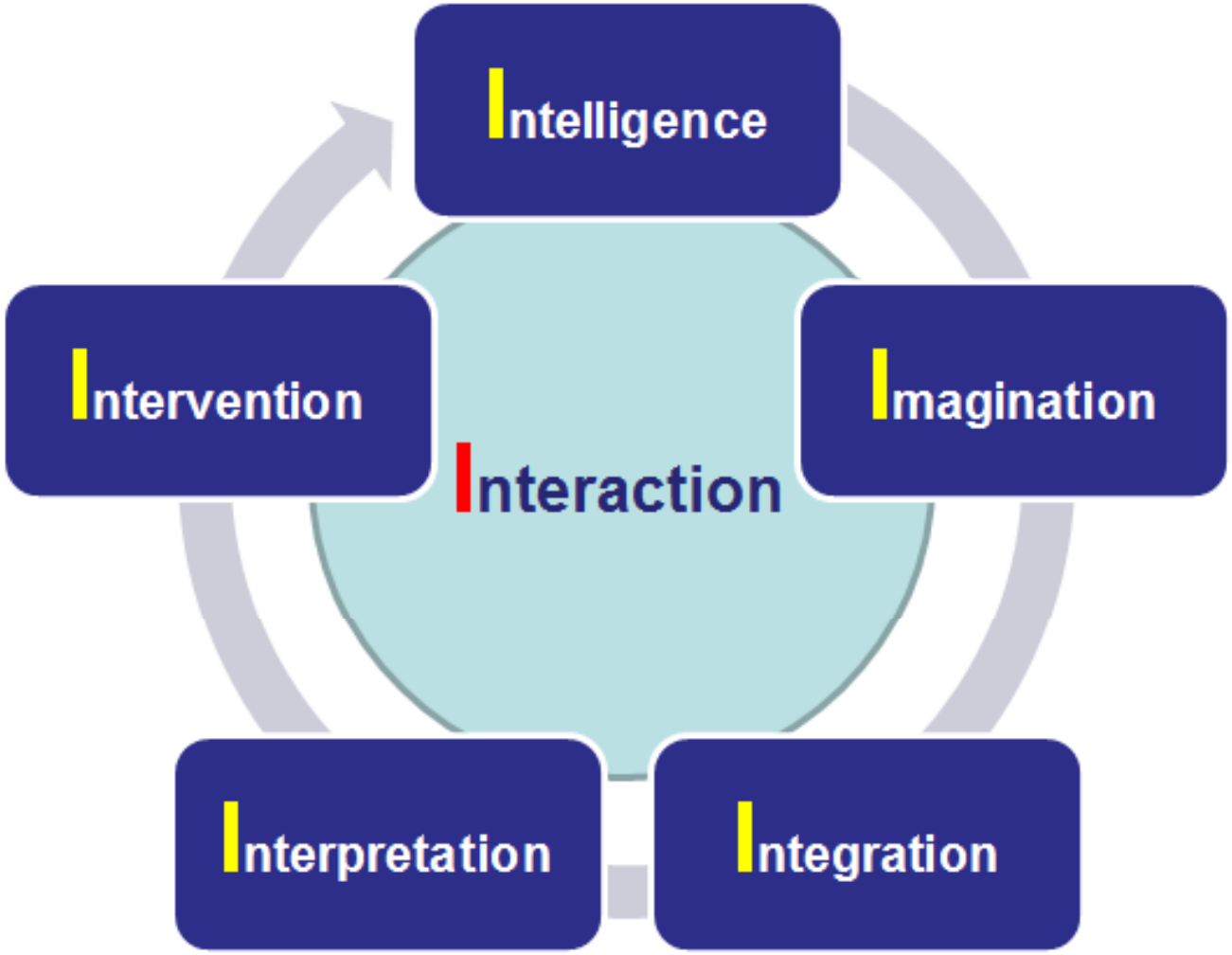
Systemic Foresight Methodology: Concept

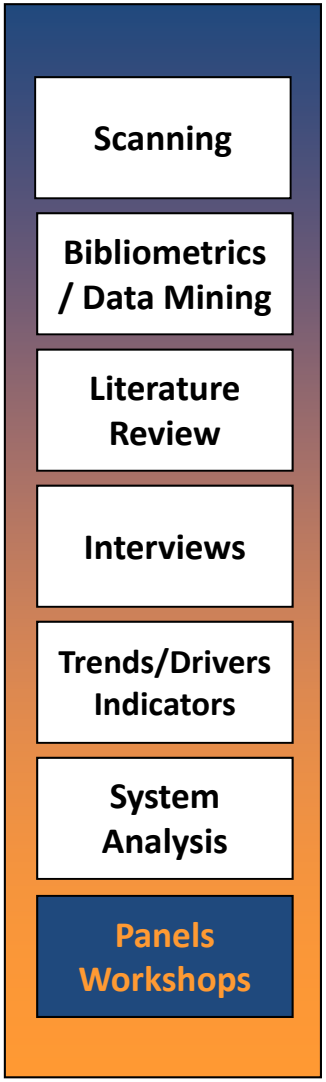


Systemic Foresight Methodology: Phases



Intelligence

survey, scan, evidence

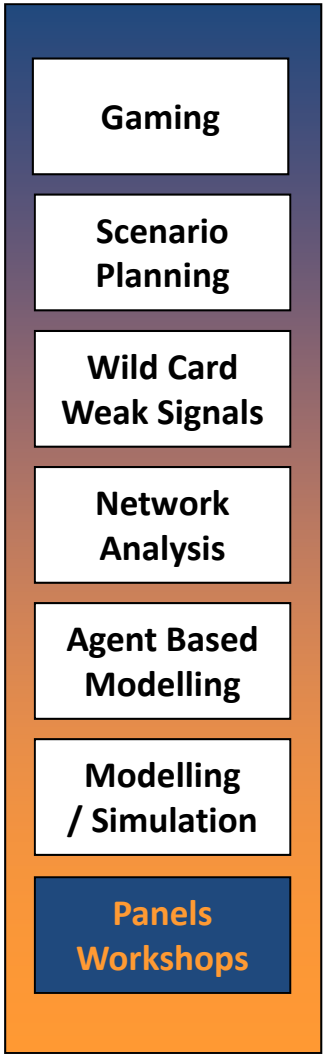


Understanding systems spatially, dynamically and historically

Scanning for Intelligence gathering

- "The systematic examination of potential threats, opportunities and likely future developments which are at the margins of current thinking and planning. Horizon scanning may explore novel and unexpected issues, as well as persistent problems or trends" (DEFRA, 2002)
- involves analysis of such as Trends, Drivers of Change, Surprises/Shocks, Discontinuities

Selecting the main areas for intervention, the boundaries of the Foresight are drawn and the 'content' of Foresight is built at this phase



Imagination

concept model. scenarios, visions

"**Imagination is more than knowledge**" – A. Einstein

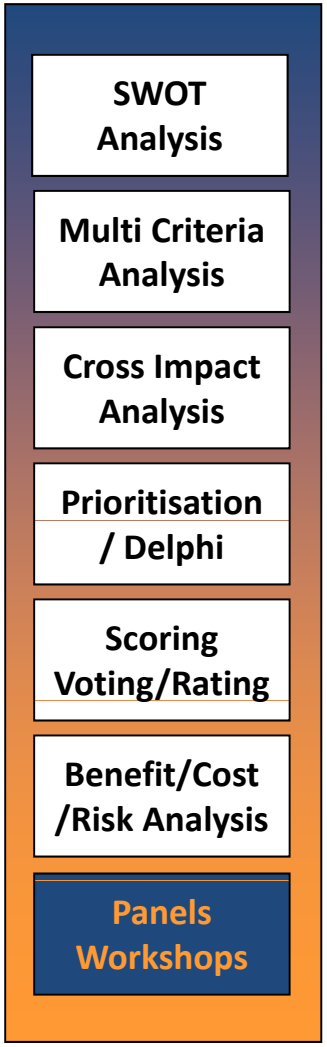
Generation of new ideas or concepts, or new associations between existing ideas or concepts

Production of models to promote understanding of systems and situations within the limits of uncertainties

Modelling formalises thought experiments leads to the further development of Foresight process and presentation of the outcome

Integration

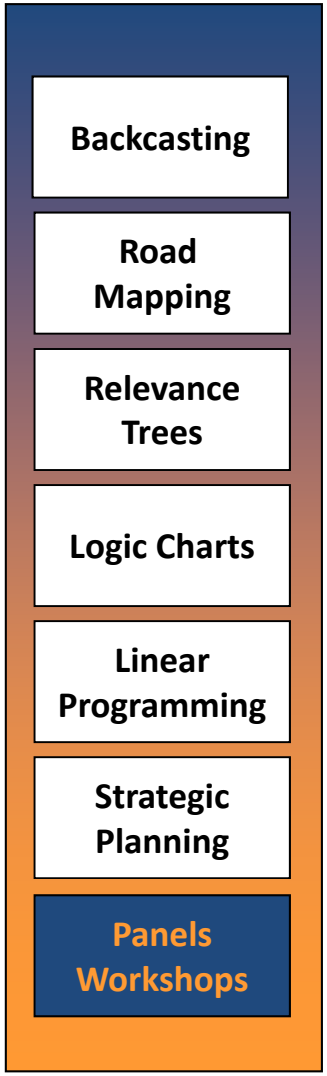
priorities, orders negotiations



- Concerned with the systemic analysis of future alternatives
- The analysis and selection of a desired system is multifaceted as there is a variety of worldviews and expectations to be negotiated.
- For a system to be viable in the long term, the claims of different stakeholders must be considered adequately, and attention must be given to ethical and aesthetic aspects for the pursuit of ideals such as beauty, truth, good and plenty (Ackoff, 1981).
- The end product of this phase is an agreed model of the future

Interpretation

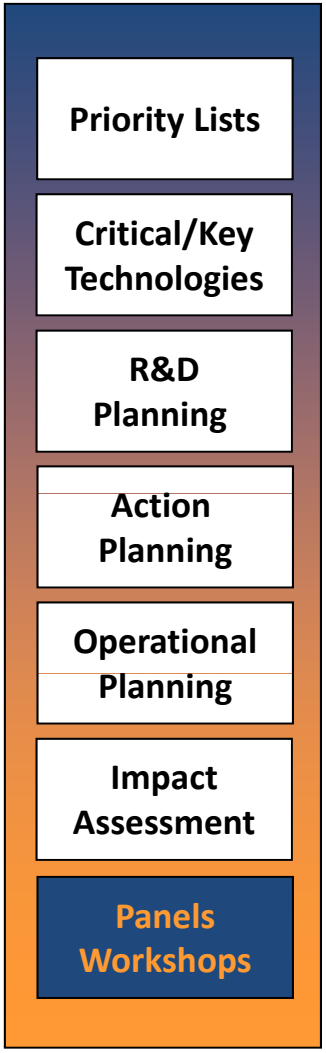
agendas, strategies



- Translates visions into strategies for a successful change programme.
- Conditions for the successful transformation strategies:
  - Assessment (e.g. processing information; developing an understanding of the continuously changing context; and becoming an open learning system)
  - Leadership (e.g. having a context-sensitive leadership; creating capabilities for change; and linking actions with resources)
  - Linking strategic and operational change (e.g. supplying visions, values and directions)
  - Management of human resources (e.g. demonstrating the need for change in people and behaviours)
  - Coherence (e.g. adaptive response to environment; and maintaining competitive advantage)

Intervention

plans, policies, actions



- Any Foresight exercise has to inform policies and actions.
- Foresight suggests actions concerning immediate change actions to implement structural and behavioural transformations.
- Actions for change are determined by considering the following capabilities of the system under investigation:
  - Adapting
  - Influencing and shaping its context
  - Finding a new milieu or modelling itself virtuously in its context
  - Adding value to the viability and development of wider wholes in which it is embedded

Interaction

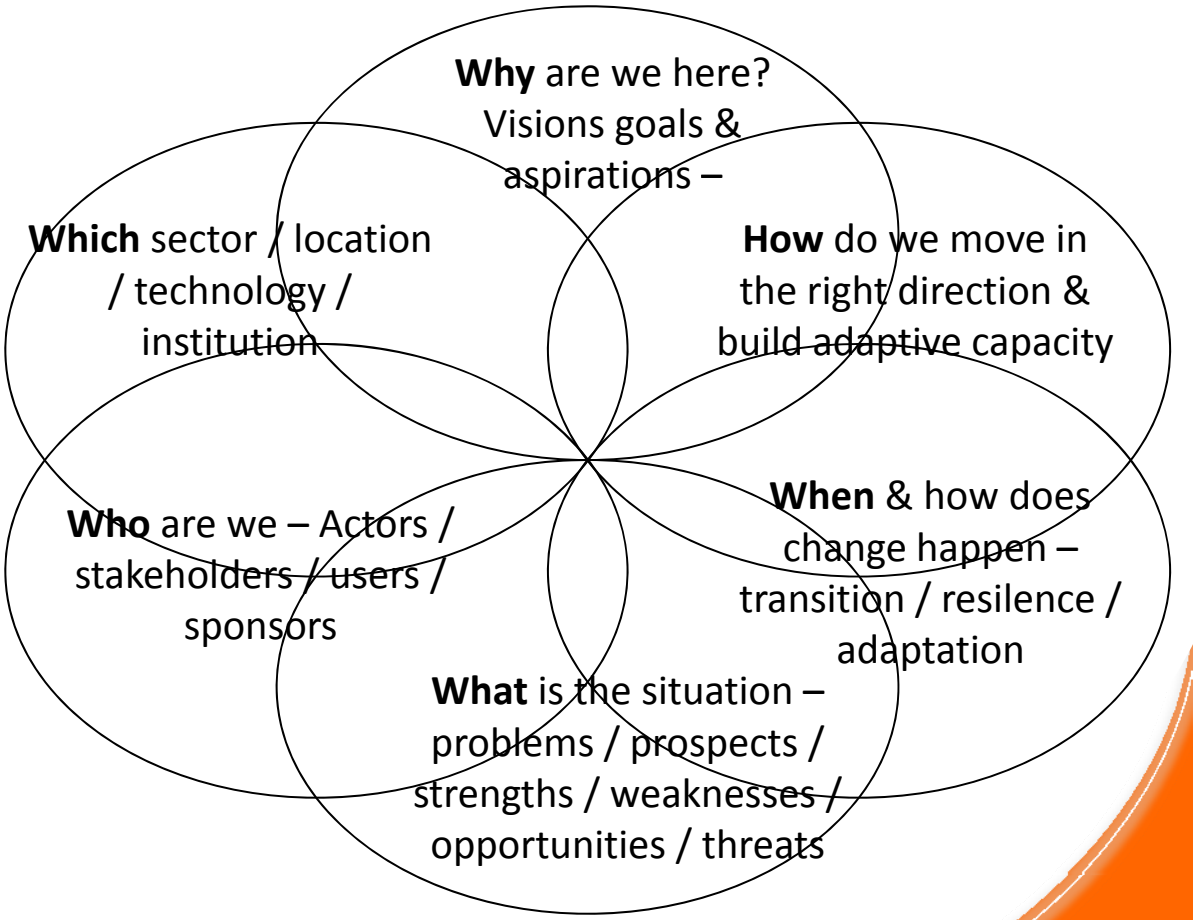
Interaction

- Shift from ‘government’ to ‘governance’ and thus a new ‘regulatory’ system
  - Inclusiveness and equity through freedom of association and expression, and an organised civil society with full protection of human rights
  - Democratic society influencing, restraining or blocking policy design and implementation
  - Contributions from society, firms, institutions, and associations to enhance public policy within a new normative and legal framework
  - Effectiveness and efficiency in meeting society’s expectations and sustainable use of resources
- The quest for new forms of governance is structured around three pillars: Governance, Socio-cultural evolution & Corporate industrial activity

Synergestic Foresight Approach (Ravetz, 2011)

- Extending FS to wider & deeper applications with Synergistics approach
- ‘Relational’ / ecosystem principle looks at wholes not just parts
- ‘Emergence’ principle looks at co-evolutionary change & shared intelligence
- ‘Mapping’ approach explores & visualizes using multiple modes of intelligence
- This helps to select methods & target results

Foresight context & logic



Synergistic Foresight Approach: Concepts

based on forthcoming book Synergy City by Joe Ravetz

- Systemic & inter-connected problems

- call for –

- Systemic & inter-connected solutions *("development pathways")*

- based on –

- Systemic analysis, methods, tools

- supported by -

- Systemic theory & cognitive framework

- implemented with –

- Systemic information / intelligence systems

BUT…

- Profound uncertainty & complexity
- Disconnection & displacement
- conflict & competition in v values & worldviews

SO….

- Explore 'synergies' – systemic critical links & pathways which link significant nodes
- Develop 'shared intelligence' – learning & innovation capacity which enables & enhances the synergies

Synergistic Foresight Approach

MANCHESTER 1824

THINKING

MAPPING

"Inter-dependence"

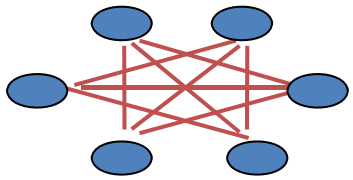
(relational concept)

- looks at whole communities, not only parts… e.g.
- relations between actors / stakeholders
- interface between different worldviews
- synergy between multiple processes

"Self-organization"

(emergence concept)

- looks at self-organization & evolution of complexity …e.g.
- supply chains & resource flows / cycles
- economic value chain & investment cycles
- social / cultural / political collective intelligence



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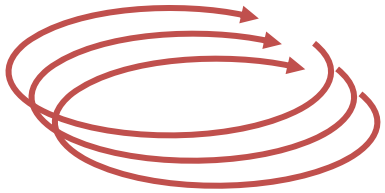
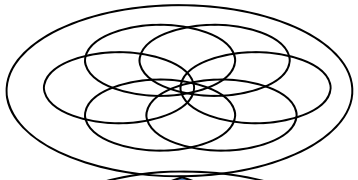
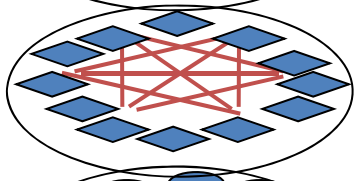
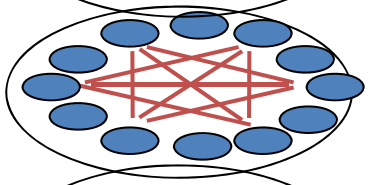
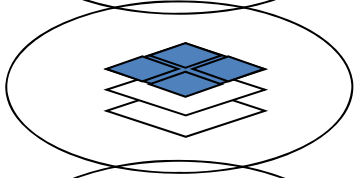
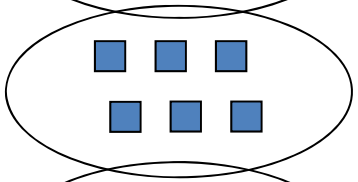
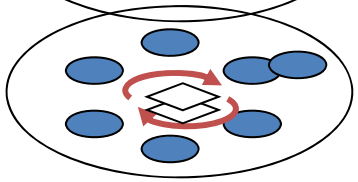
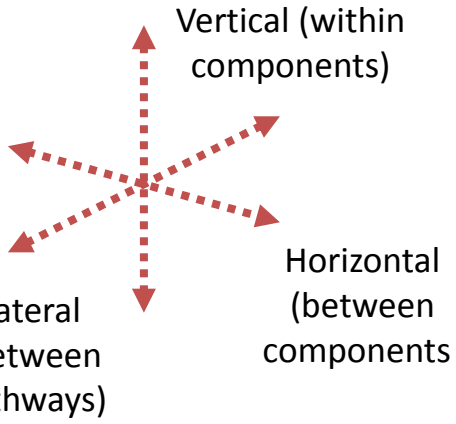


Evolutionary pathways towards shared intelligence

Synergy maps & application to Foresight process (Ravetz, 2011)

Relational view		Emergence view
Discourse / worldviews / values		Explore multiple worldviews & looking for shared values, goals
Factors / themes		Explore causal links & loops between themes & sectors
Actors / stakeholders		Explore relations between actors & look for synergies & shared interests
Sectors / places / policies		Focus on the sector/ place / situation, with internal & external relations / impacts
Factors / technology / regime		Focus on the system / technology / engineering & the opportunities
'Vectors' / processes / dynamics		Explore the proceses / metabolism & dynamics of change & transition

Shared intelligence mapping



The shared intelligence mapping explores the potential for learning / innovation which links between different component / stakeholders / synergies

Relational mapping applications – example (Ravetz, 2011)

Component view

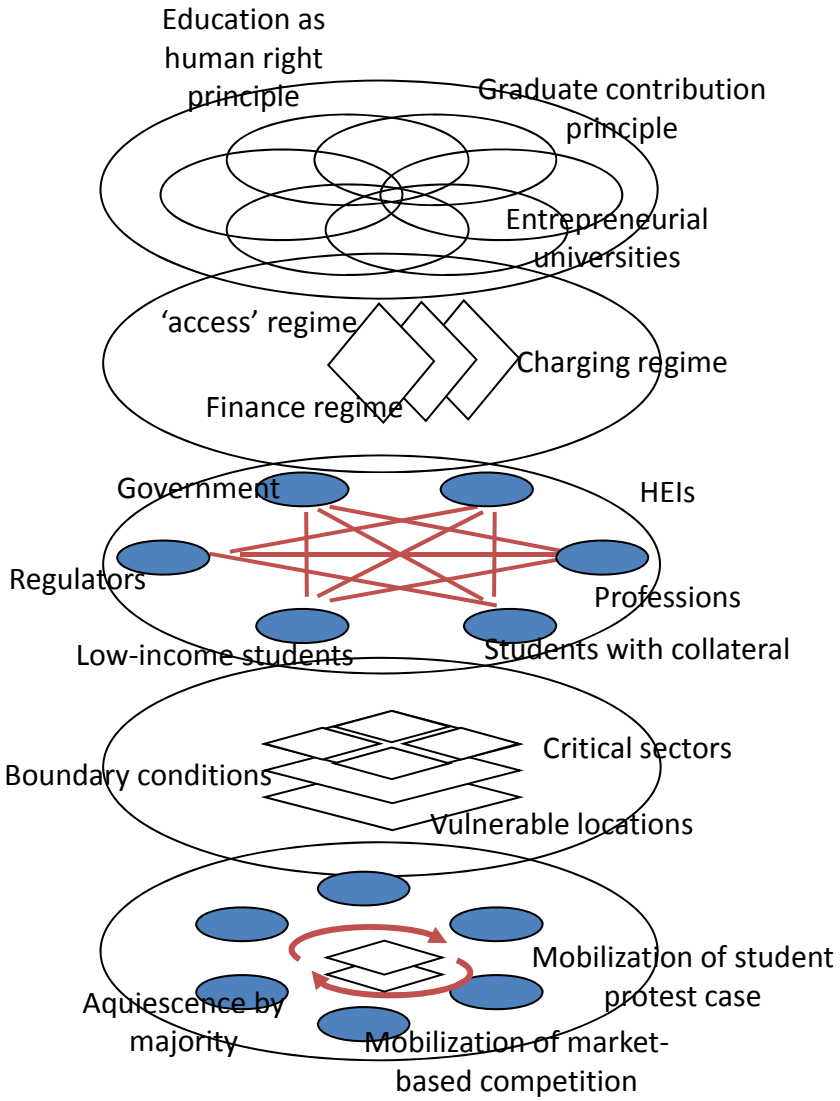
Discourse / worldviews / values

Factors / themes

Actors / stakeholders

Places / spaces

'Vectors' / processes / opportunities



Synergy view

Shared intelligence between actors / factors / sectors etc: e.g. awareness of shared interests between students, institutions, regulators etc

Shared intelligence between parallel systems (e.g. other education / other public services / impact of student populations etc

SFM + Synergistic approach: Process Design

	SCOPE & SURVEY	CREATIVE PHASE	ORDERING PHASE	APPLICATION PHASE	DISSEMIN ATION
	Intelligence	*Imagination*	*Integration*	*Interpretation*	*Intervention*
Worldviews / goals (why)					
Futures strand (when)					
Capacity strand (who)					
Strategy strand (how)					
Theme strand (which)					

SFM + Synergistic approach: Methods & Tools

	SCOPE / SURVEY PHASE	CREATIVE PHASE	ORDERING PHASE	STRATEGY PHASE	ACTION PHASE	
	INTELLIGENCE	*IMAGINATION*	*INTEGRATION*	*INTER PRETATION*	*INTER VENTION*	
	Survey, scan, evidence	*Concept model, visions, scenarios*	*Priorities, analysis, negotiations*	*agendas & strategies*	*Plans, policies, actions*	
"Divergent" methods	Horizon scanning Weak signal	Visioning / social priority choice	Backcasting Wild card study	SWOT analysis		
(more open, creative,)	Trend analysis	Scenario stories / images	Success scenarios	Scenario planning	Strategic planning	
	Social Network analysis	Policy scenarios	Risk assessment	Roadmapping	Critical / key technologies	
	Knowledge / research map	Scenario analysis	Delphi / online Delphi	Cross impact analysis	Operational research	
	Literature review	Agent based modelling	Multi-criteria	Logic framework		
	STI policy analysis	Scenario modelling	Social cost benefit	Linear programming	Policy impact assessment	
"Convergent methods" *(more specific, quantitative)*	Bibliometrics Patent analysis	System dynamics	Cost benefit analysis			

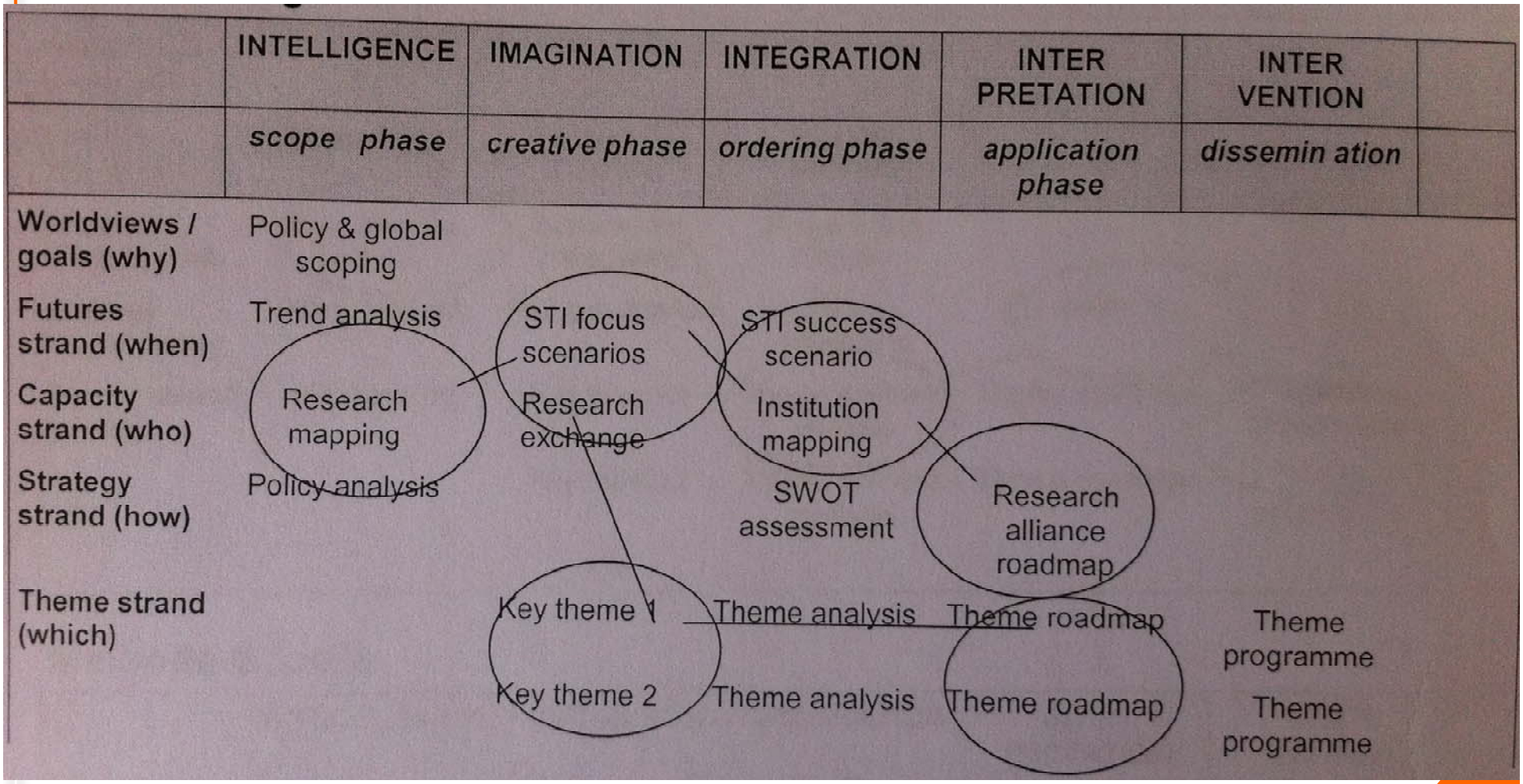
Saritas & Ravetz (2011)

SFM + Synergistic approach: Programme design

	SCOPE & SURVEY	CREATIVE PHASE	ORDERING PHASE	APPLICATION PHASE	DISSEMIN ATION
	Intelligence	*Imagination*	*Integration*	*Interpretation*	*Intervention*
Stakeholders					
Events					
Information					
Resources					
Communication					

Mauritius National Research & Innovation Foresight

Process design with research focus



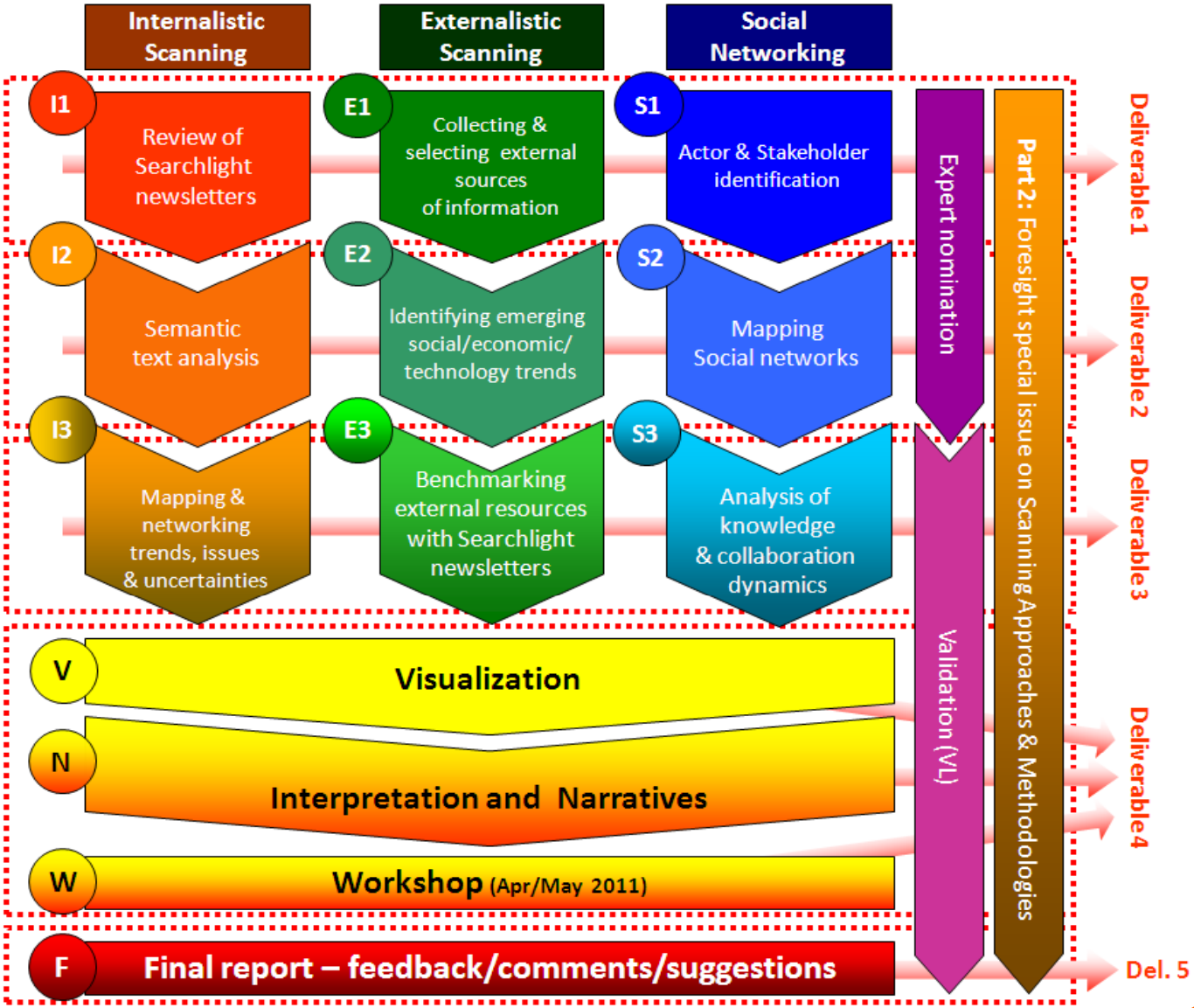
Methods and tools with research focus

	INTELLIGENCE	IMAGINATION	INTEGRATION	INTER PRETATION	INTER VENTION	
	Survey, scan, evidence	*Concept model, visions, scenarios*	*Priorities, orders, negotiations*	*agendas & strategies*	*Plans, policies, actions*	
Divergent methods	Global trend review					
	Research / citation mapping	External scenarios	Response scenarios			
	Policy review	STI scenario	Network mapping	R&D roadmaps	STI strategy	
	Educatn survey	Scenario analysis	Demand side model / analysis	Technology assessment	Technology strategy	
Convergent methods	Bibliometrics Patent analysis					

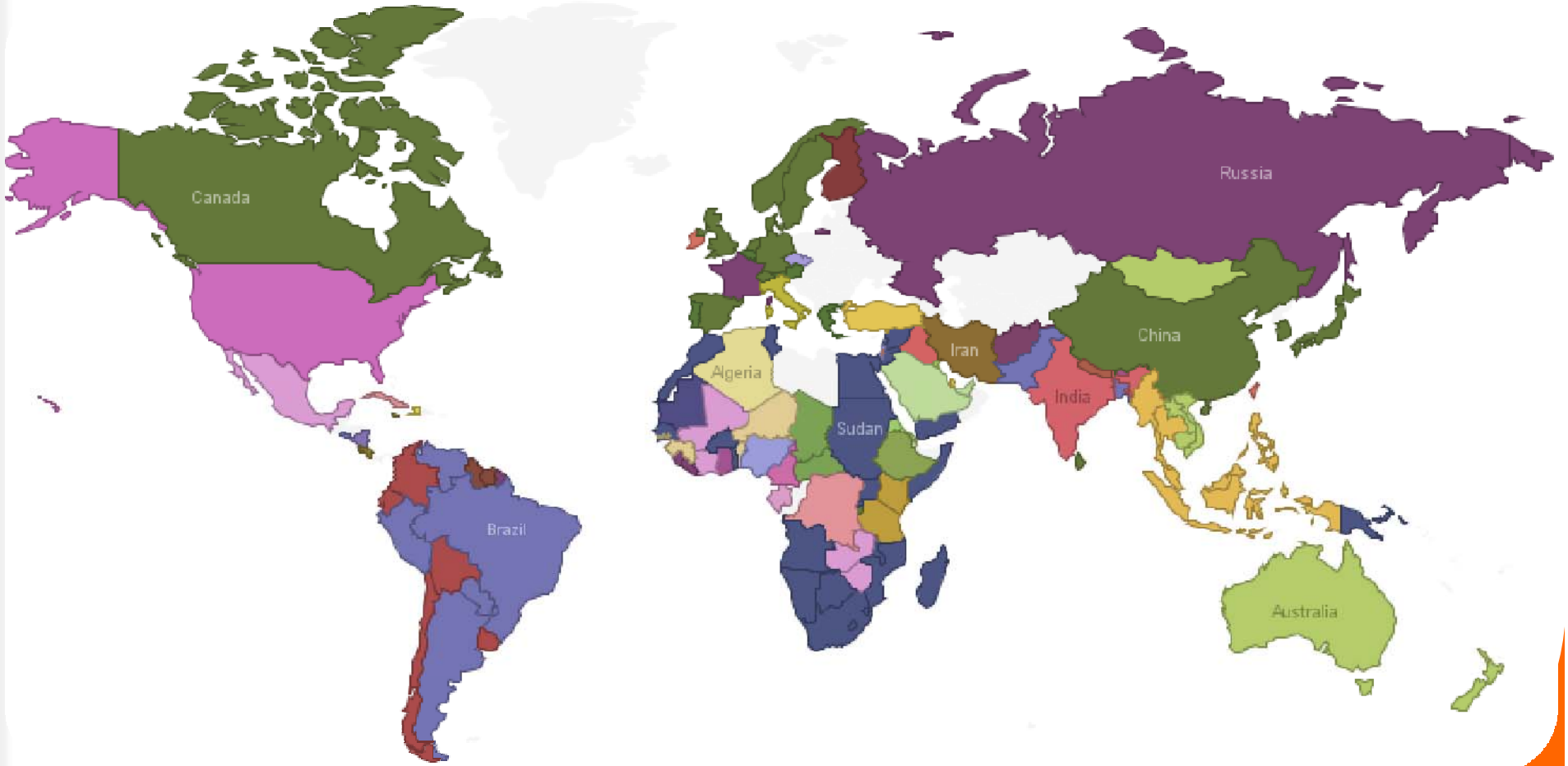
Programme design with research focus

	SCOPE PHASE	CREATIVE PHASE	ORDERING PHASE	APPLICATION PHASE	DISSEMIN ATION	
	Intelligence	*Imagination*	*Integration*	*Interpretation*	*Intervention*	
Stakeholders	Res alliance Themes / sector					
Events	SG + Full workshop	Theme worksh	Theme worksh	SG	SG	
Information	Research focus	Creative focus		Strategy focus	Policy focus	
Resources						
Comms	Res alliance	Res alliance	Theme / sectors	Theme / sectors	Policy & public	

Scan-4-Light: Global scan for urban futures

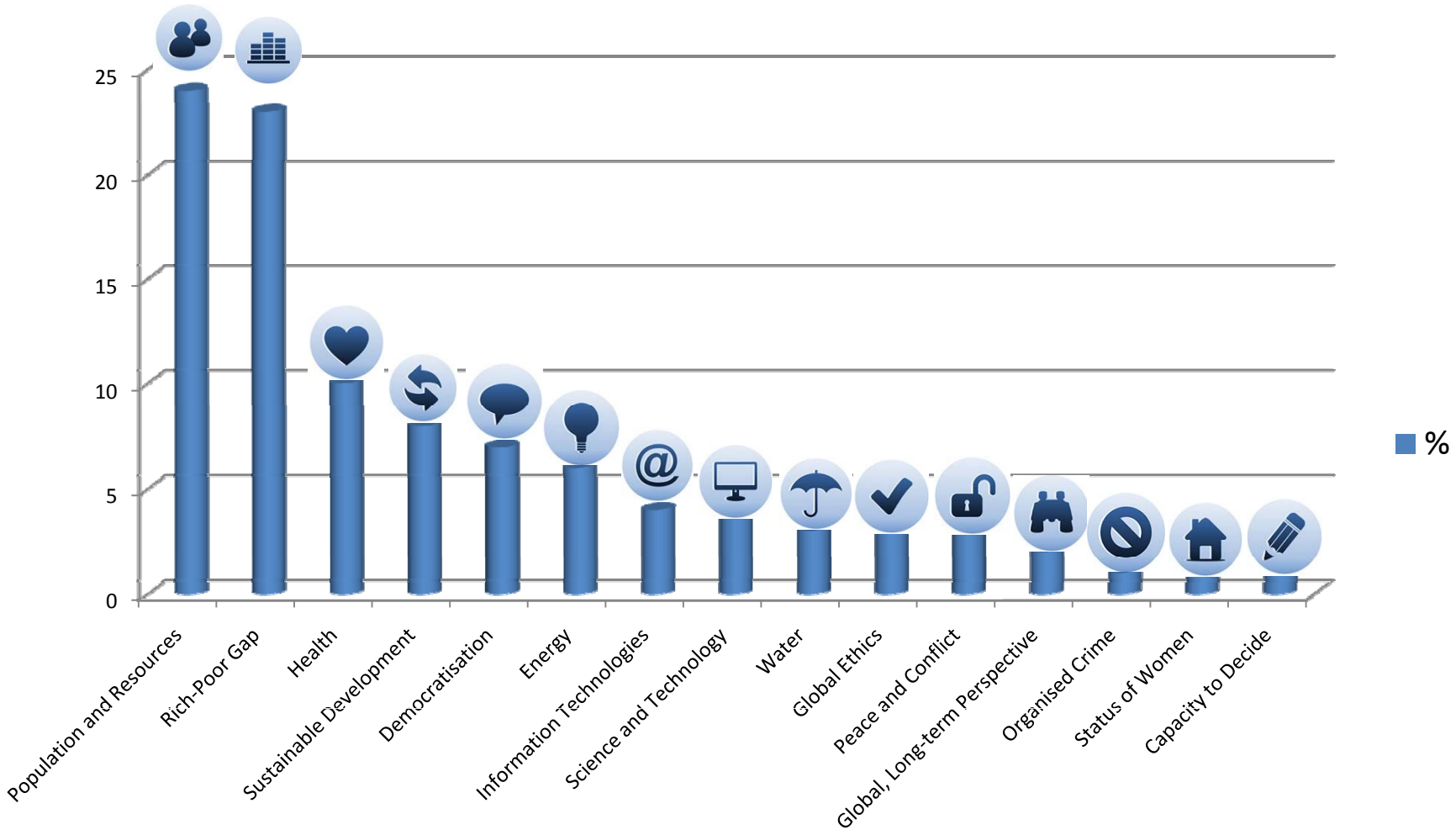


Countries covered

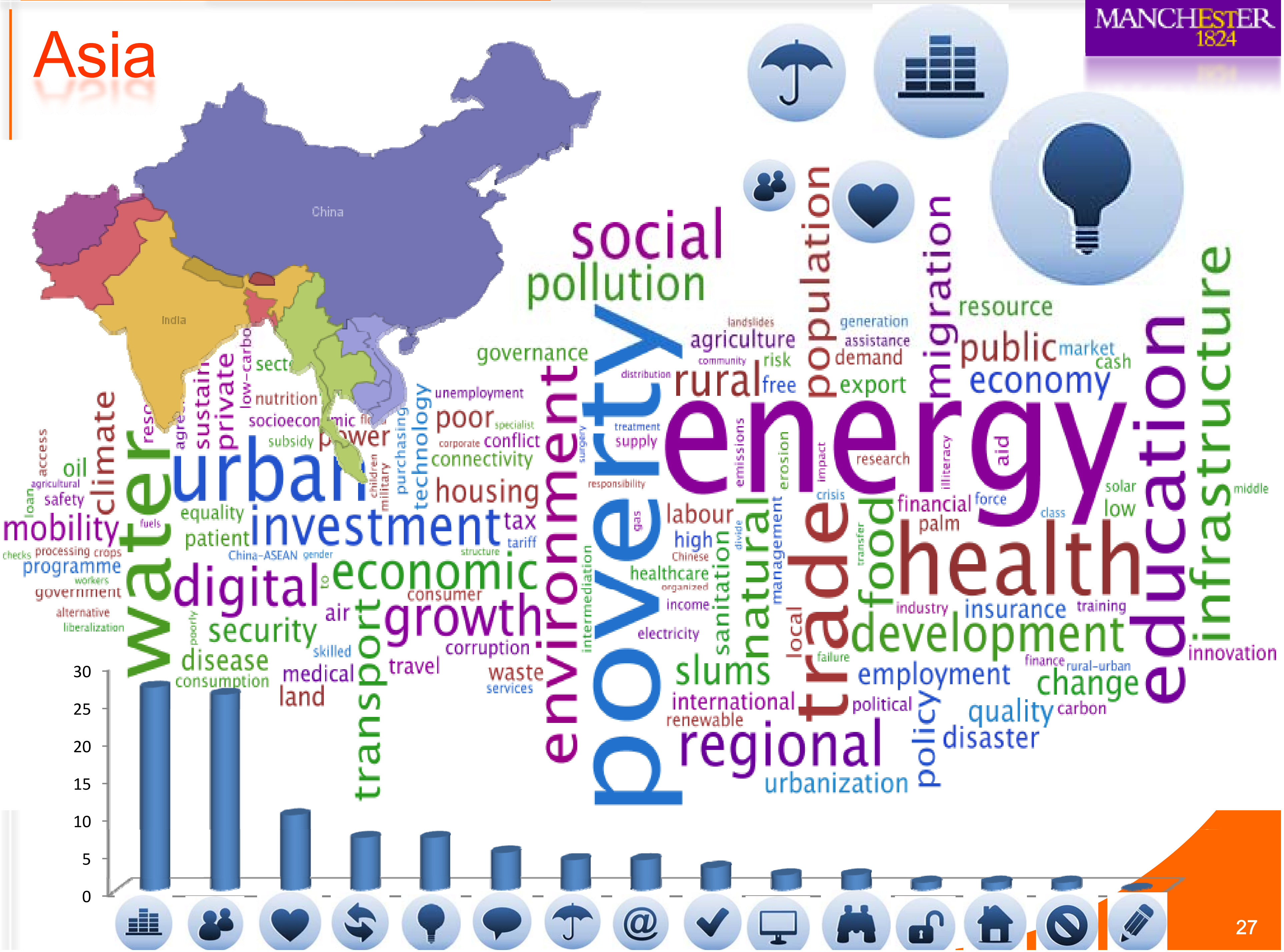


Global developmental issues

15 Global Challenges



Asia



China
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pollution
poverty
energy
health
education
infrastructure
environment
water
urban
investment
digital
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growth
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population
migration
development
regional
transport
natural
food
rural
agriculture
public
economy
resource
governance
unemployment
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housing
conflict
connectivity
technology
security
disease
mobility
climate
oil
safety
equality
patient
programme
government
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Africa


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Angola
Zambia
Namibia


health
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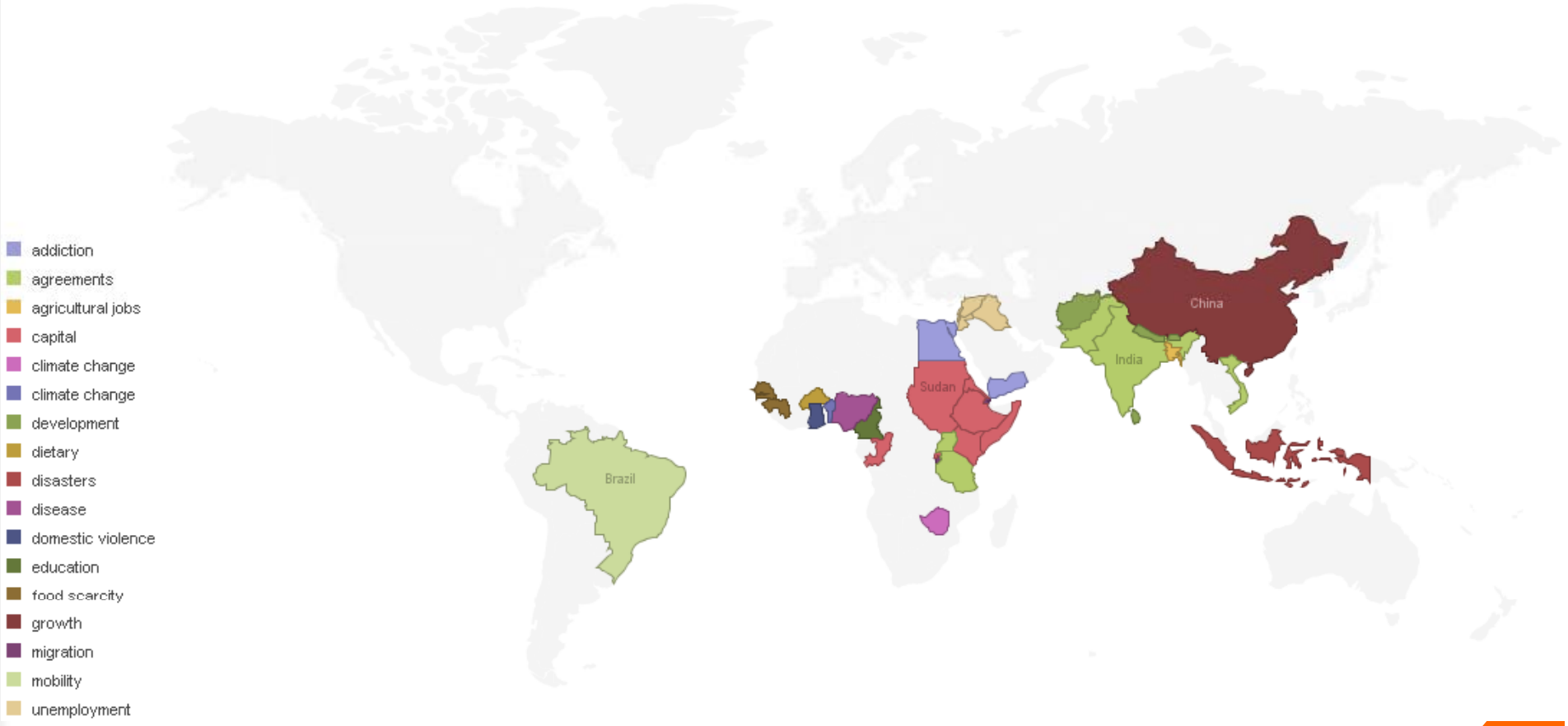
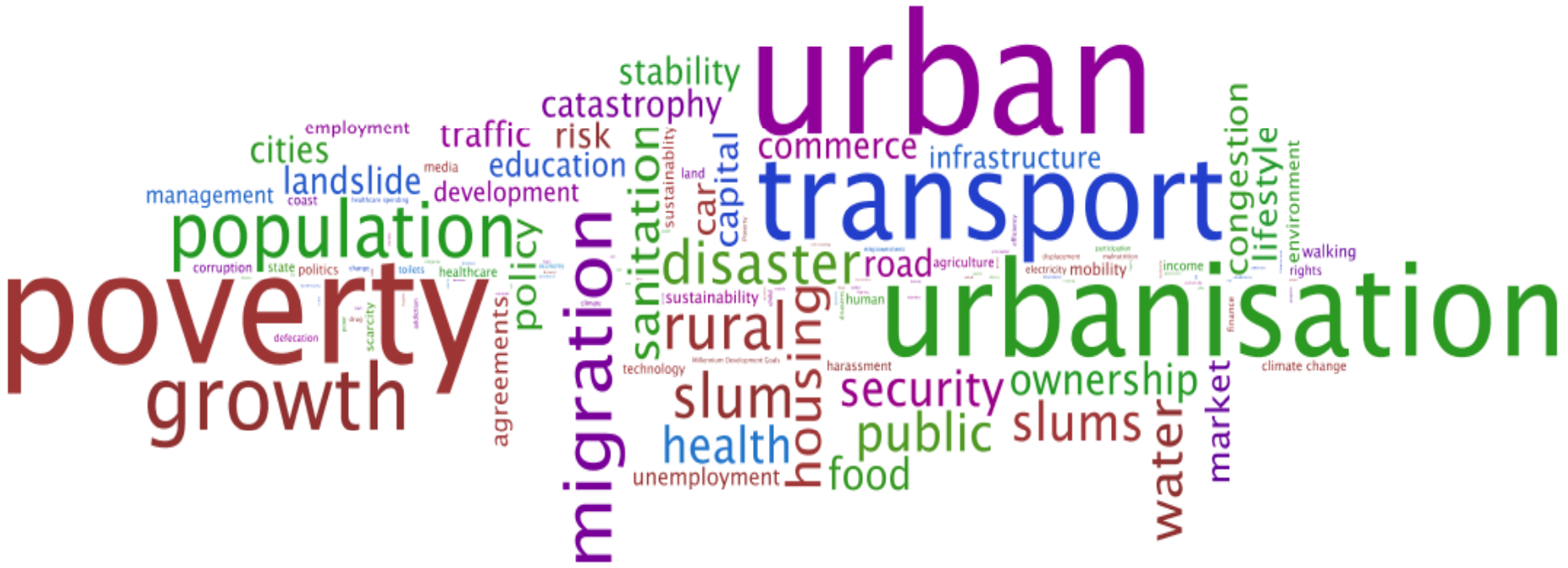
South America

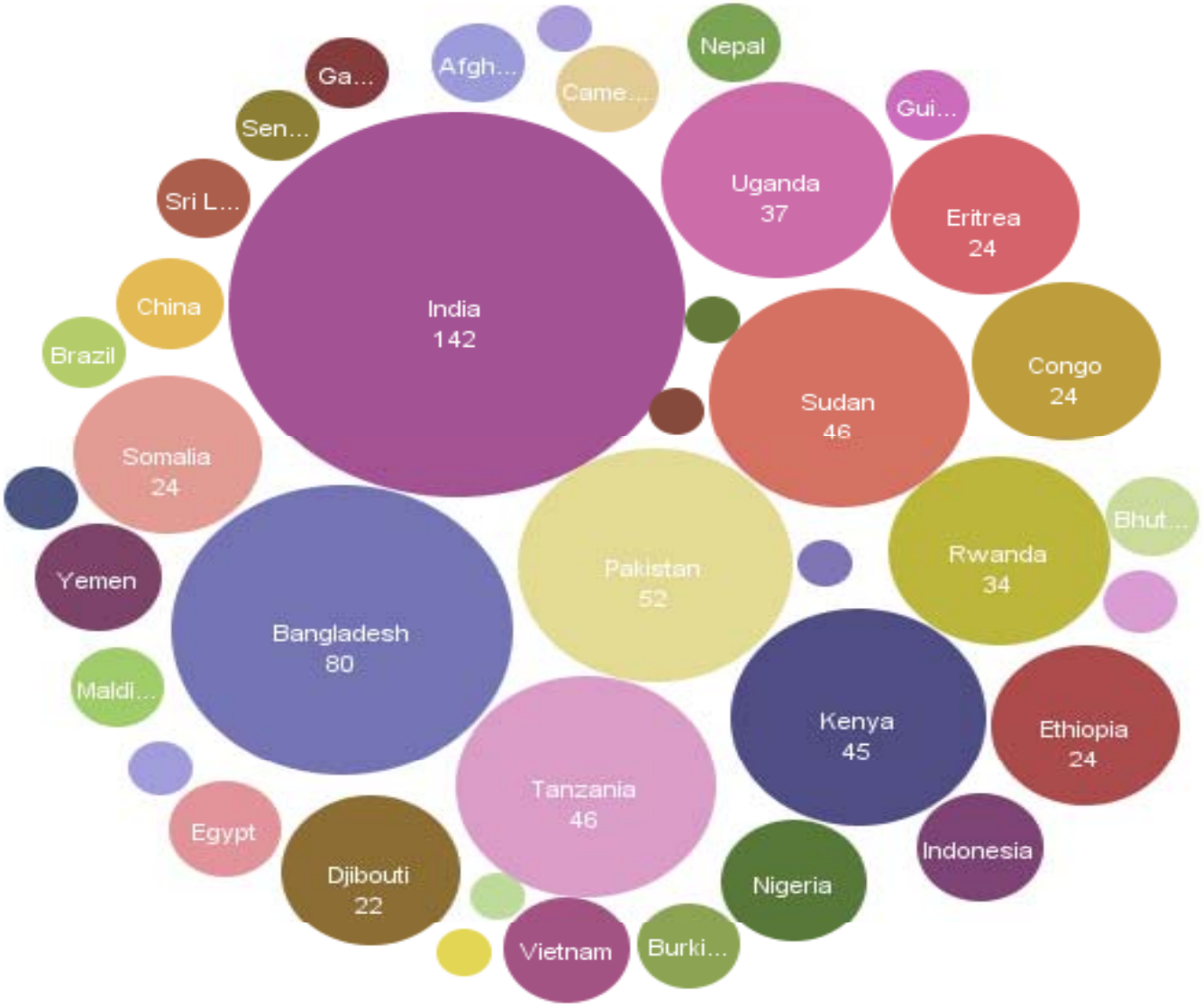
Urban poverty – countries focused



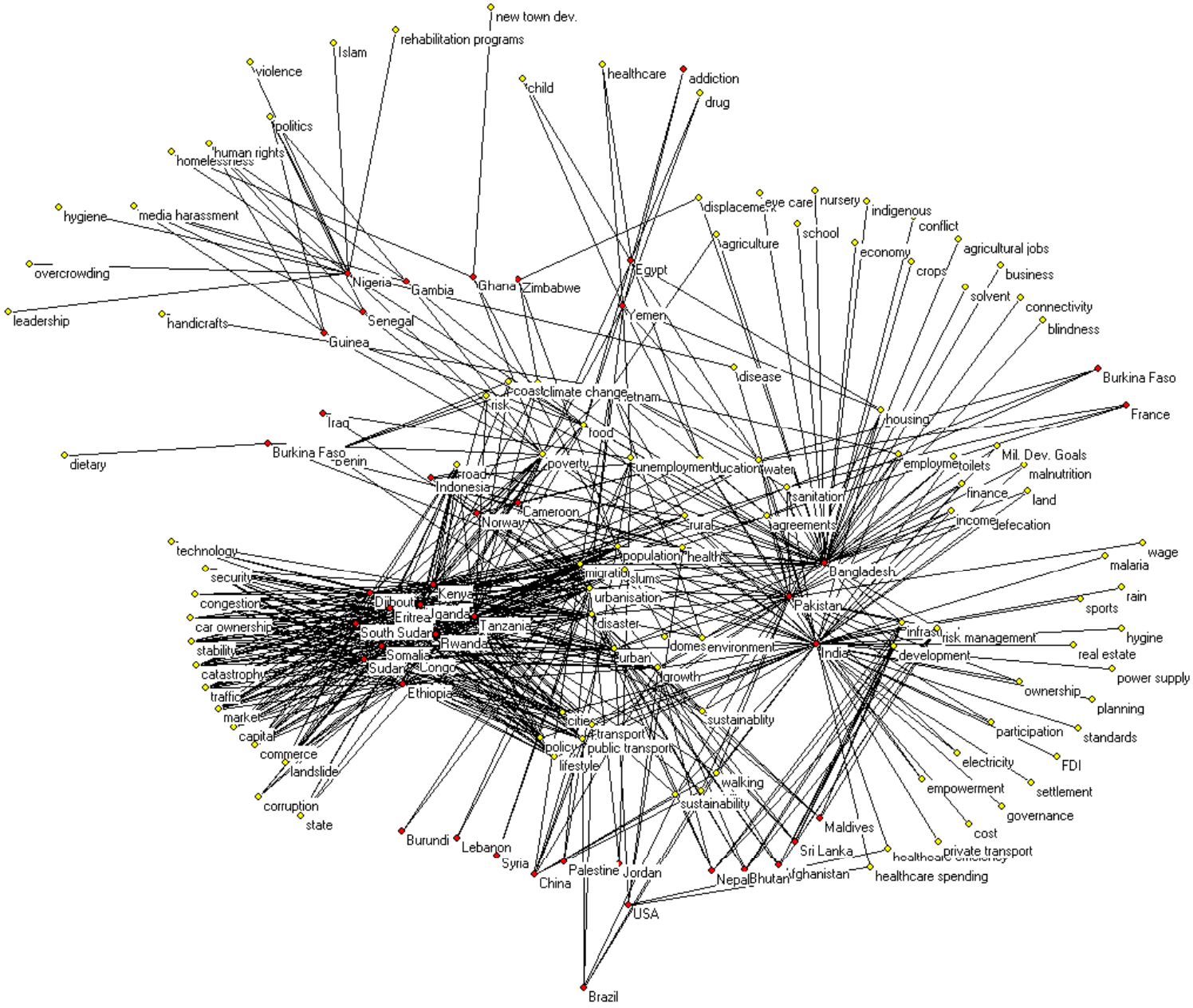
Urban Poverty - issues



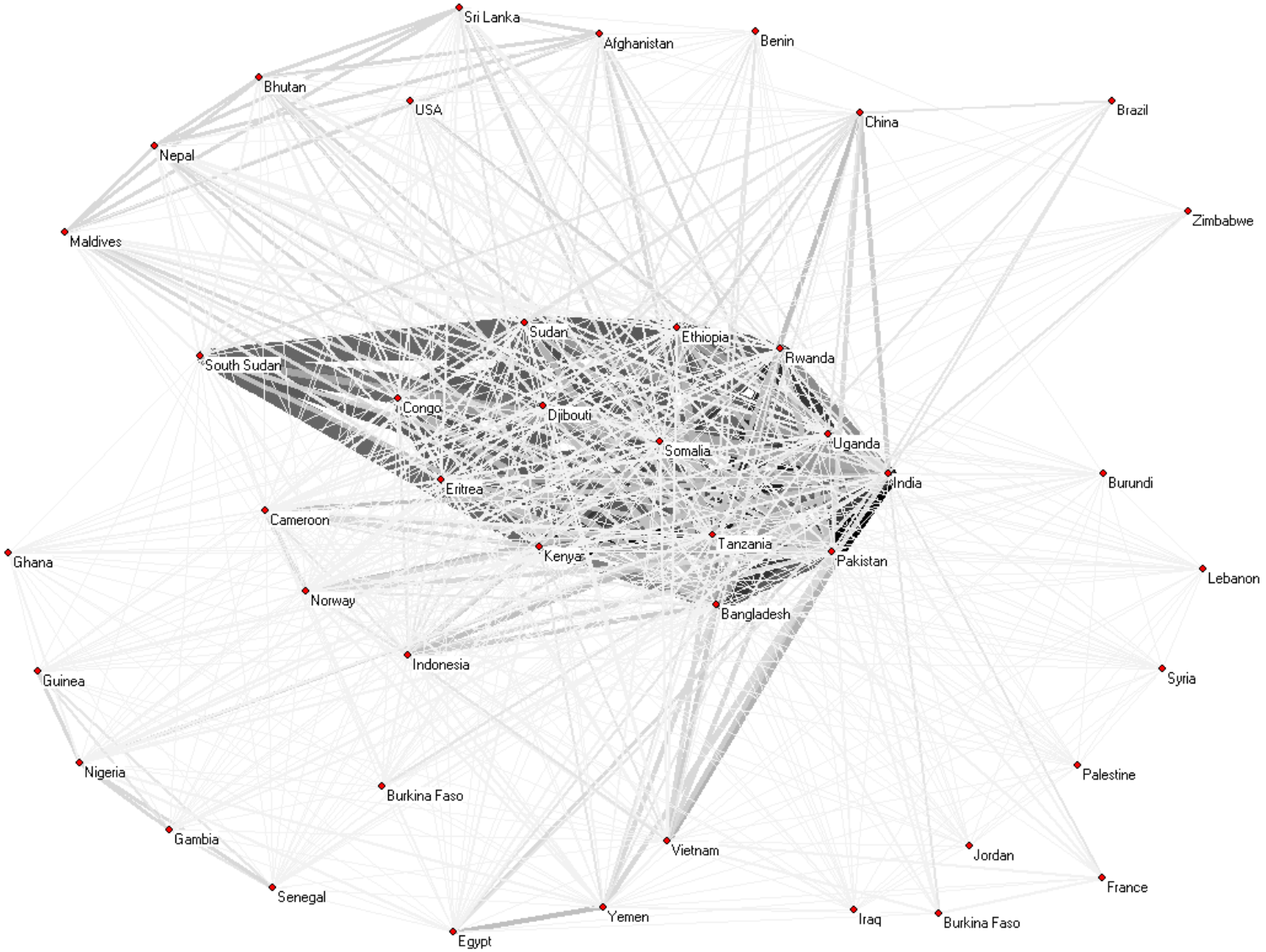
Urban poverty – freq.s by country



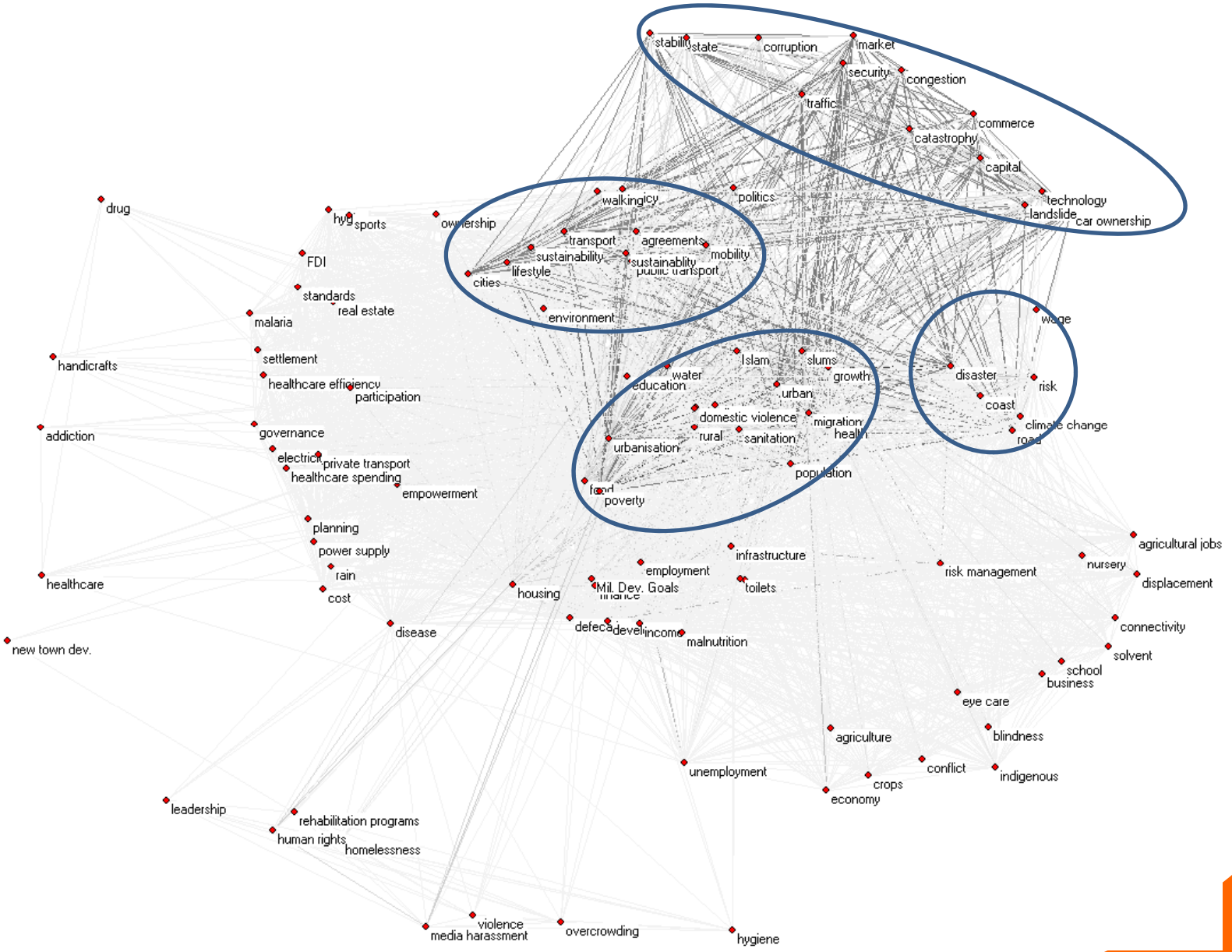
Urban Poverty-countries & issues



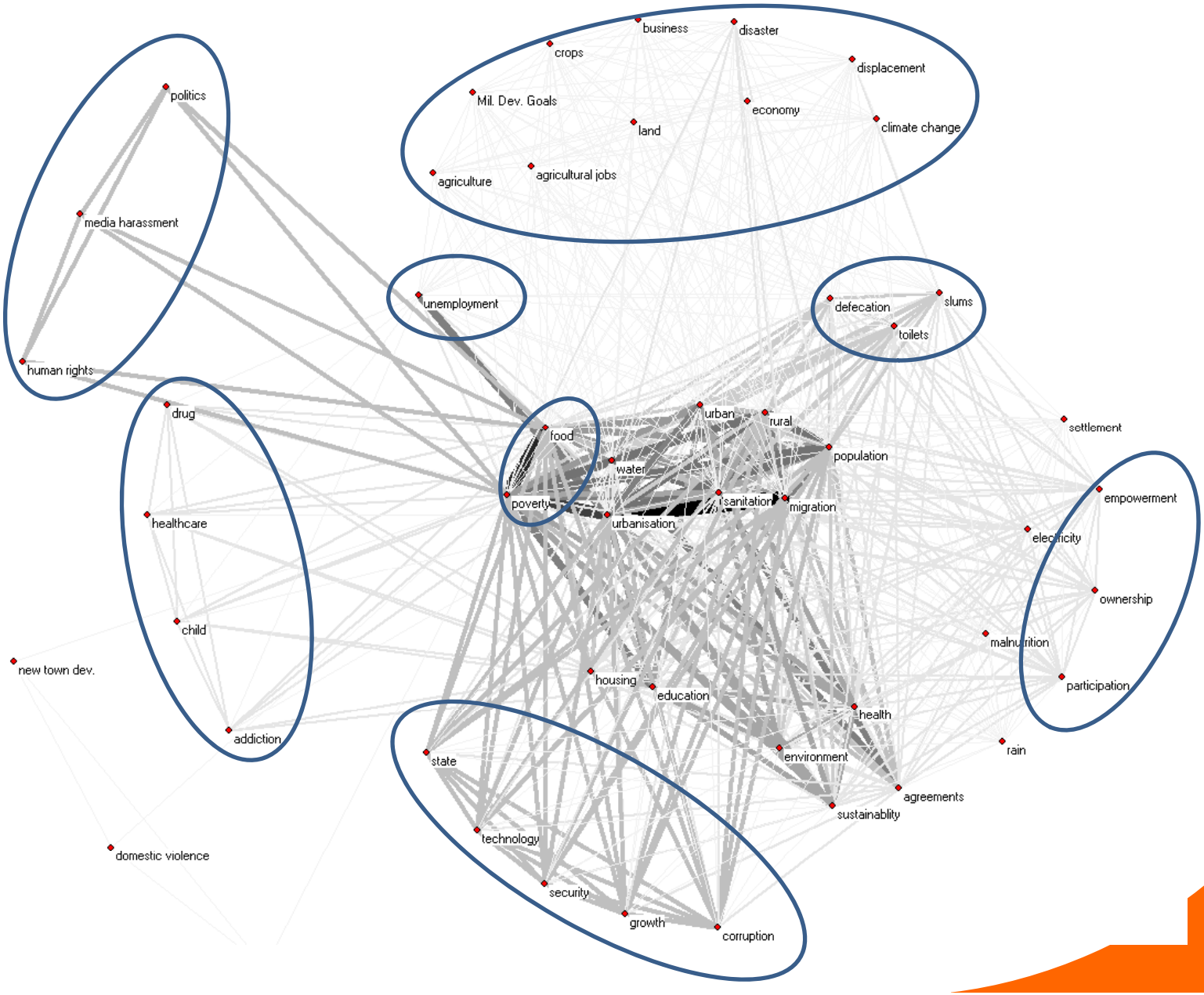
Urban Poverty – network of countries



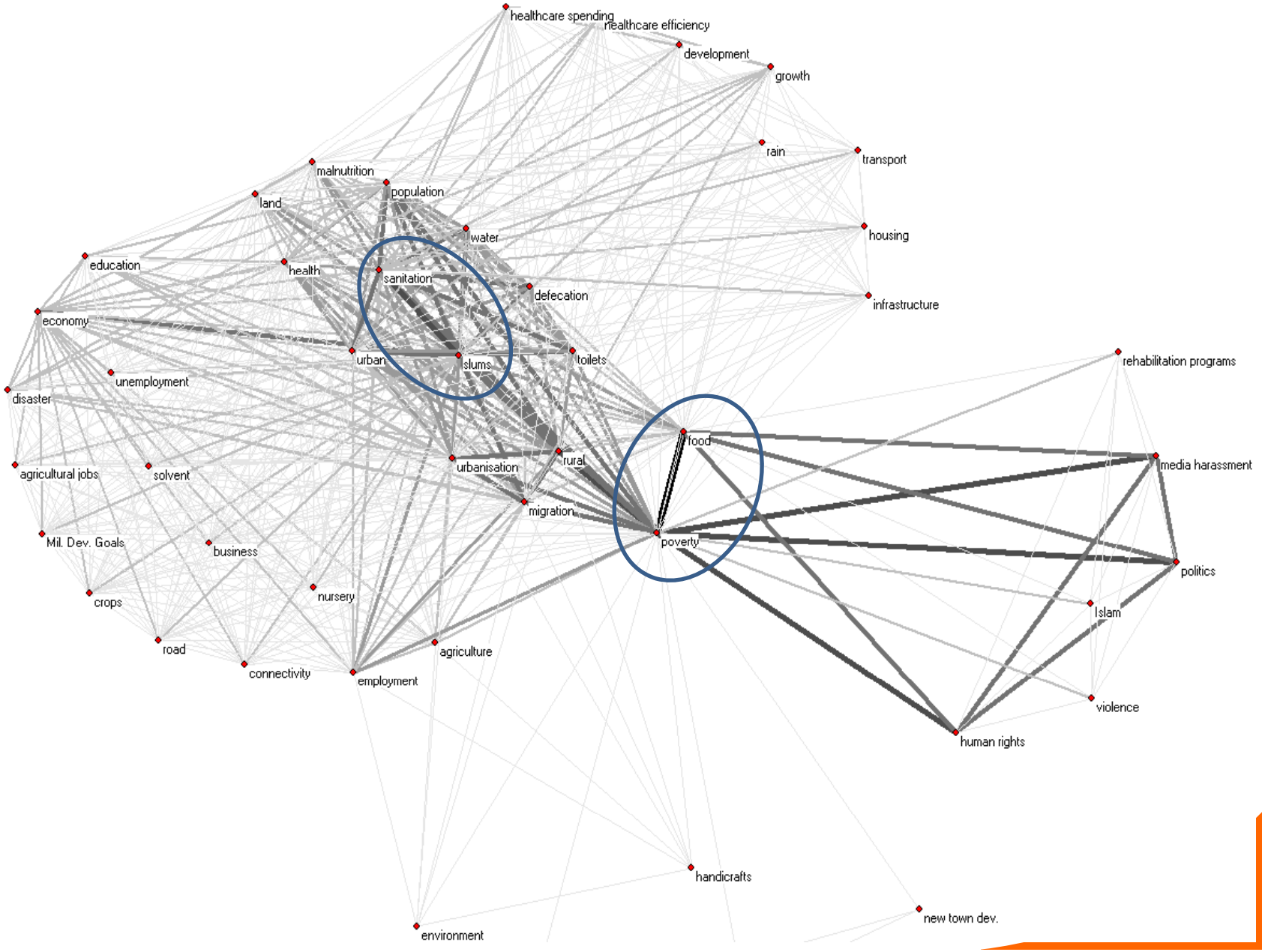
Urban Poverty – network of issues



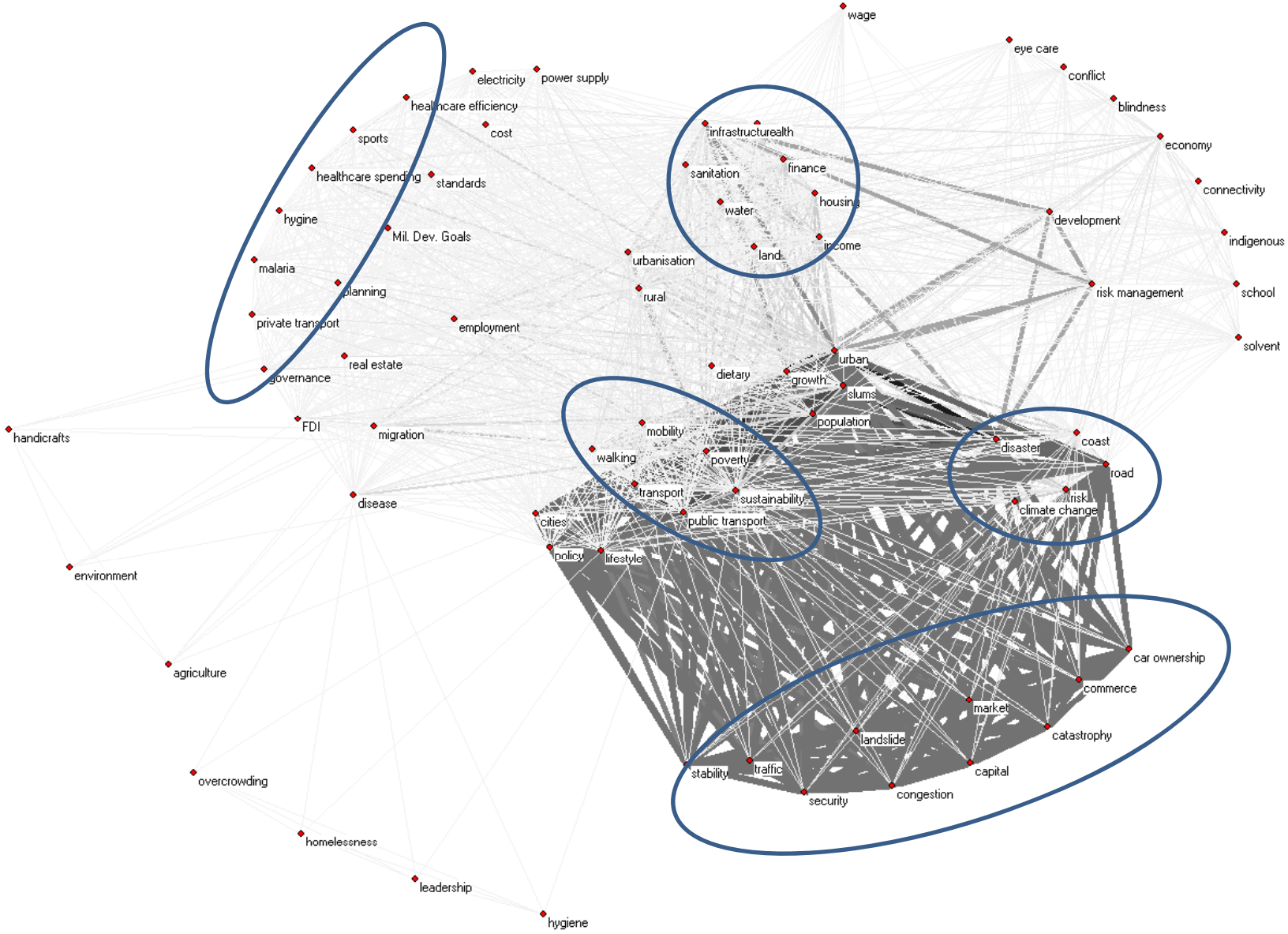
Urban Poverty – issues (<1999)



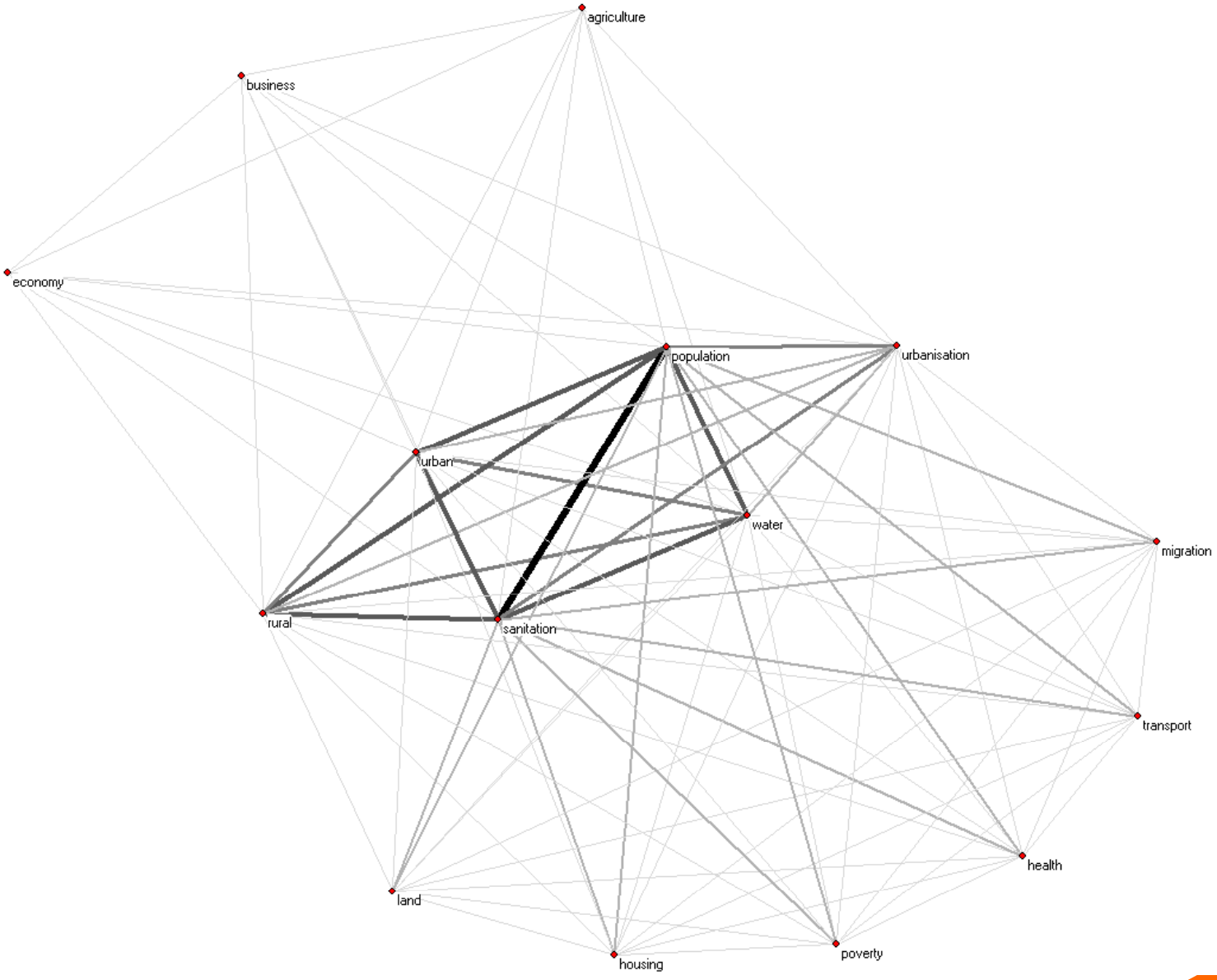
Urban Poverty – issues (2000-09)



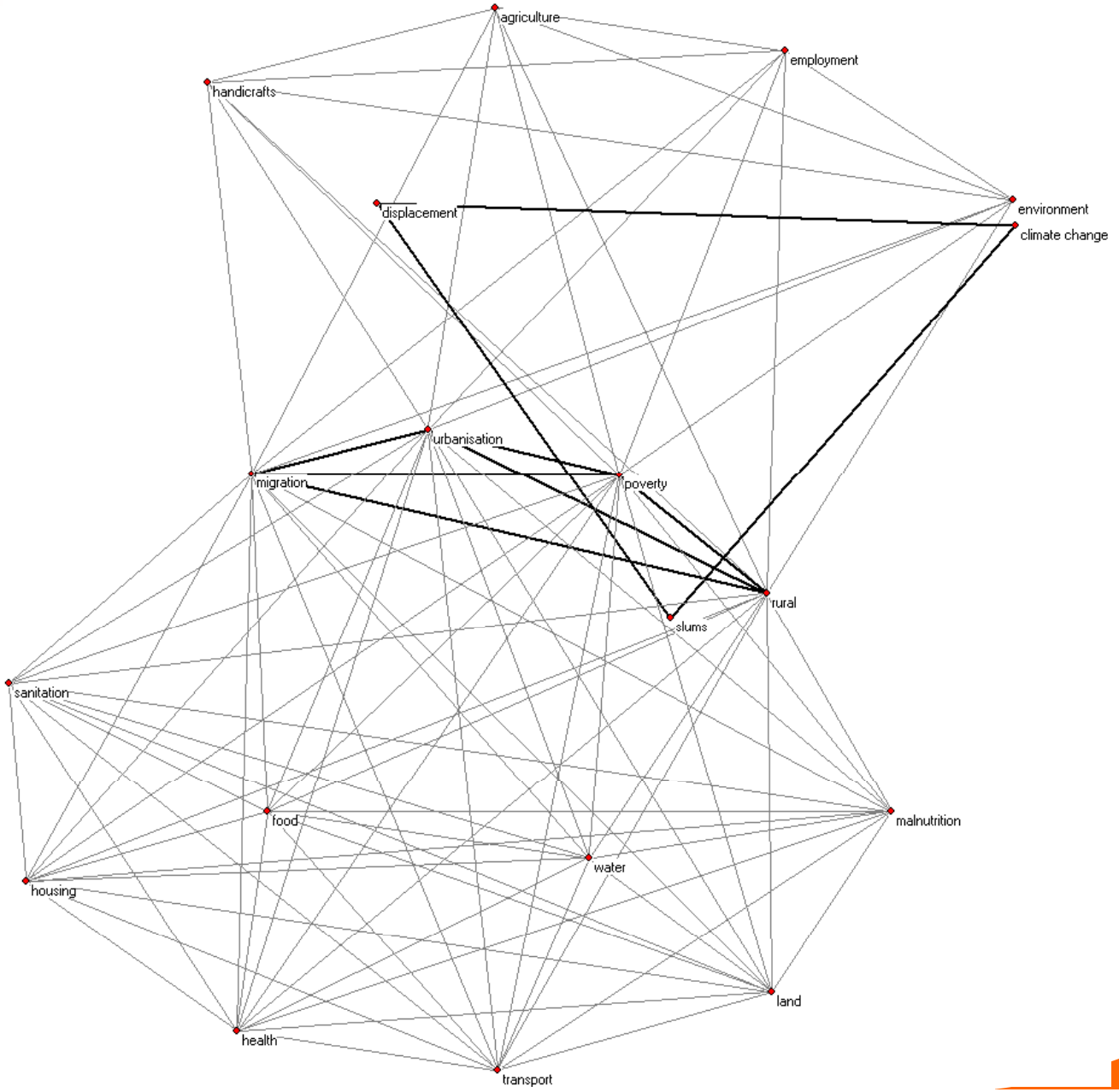
Urban Poverty – issues (2010-19)



Urban Poverty – issues (2020-29)



Urban Poverty – issues (2030 <)

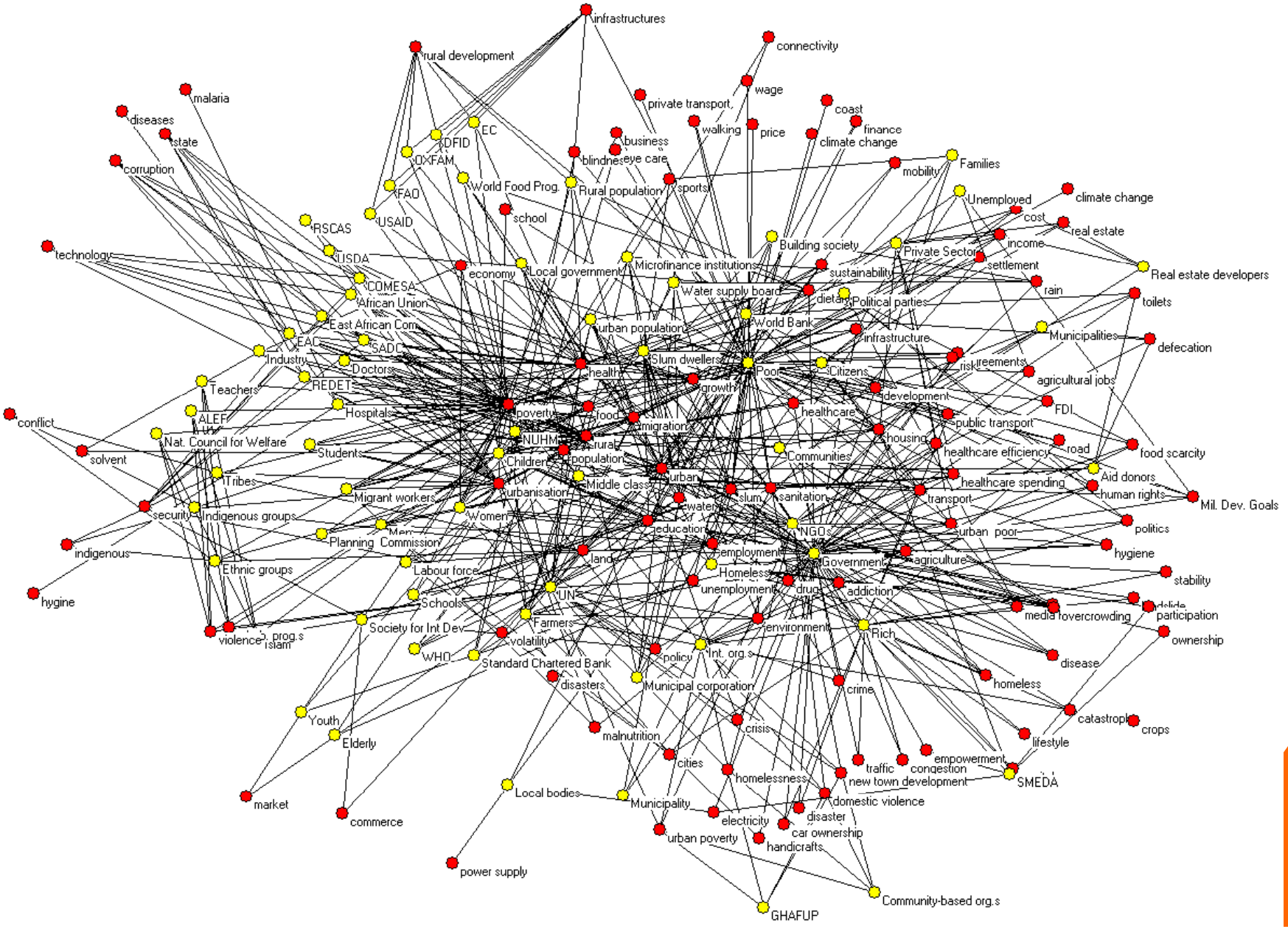


Urban Poverty - centrality measures

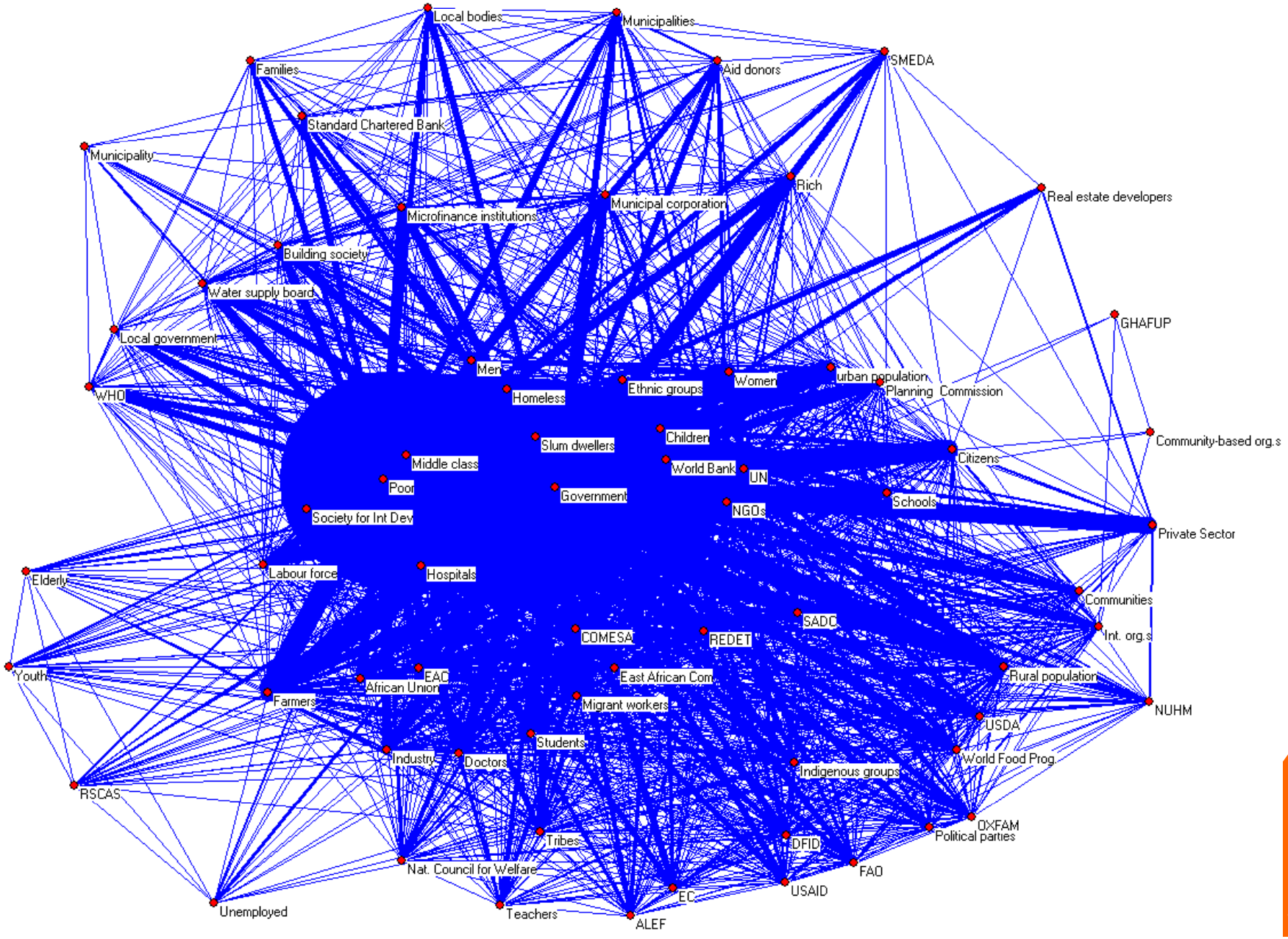
based on Freeman's degree of centrality

	<1999	2000-2009	2010-2019	2020-2029	2030 <
1	Poverty (170)	Poverty (105)	Urban (406)	Population (36)	Rural (18)
2	Urbanisation (156)	Slums (92)	Poverty (394)	Sanitation (36)	Poverty (18)
3	Food (131)	Sanitation (83)	Population (379)	Water (25)	Migration (18)
4	Rural (121)	Rural (76)	Growth (350)	Rural (25)	Urbanisation (18)
5	Population (121)	Food (73)	Slums (340)	Urban (25)	Malnutrition (11)
6	Water (115)	Population (69)	Disaster (320)	Urbanisation (21)	Food (11)
7	Migration (110)	Migration (69)	Public transport (314)	Poverty (13)	Sanitation (11)
8	Sanitation (97)	Urbanisation (67)	Transport (314)	Housing (13)	Health (11)
9	Urban (94)	Urban (66)	Policy (281)	Transport (13)	Land (11)
10	Education (88)	Health (64)	Cities (281)	Land (13)	Water (11)
11	Agreements (75)	Defecation (62)	Road (268)	Health (13)	Transport (11)
12	Health (70)	Water (62)	Lifestyle (262)	Migration (13)	Housing (11)
13	Sustainability (70)	Toilets (62)	Landslide (238)	Business (8)	Handicrafts (7)
14	Environment (70)	Economy (58)	Catastrophe (238)	Economy (8)	Environment (7)
15	Slums (67)	Malnutrition (53)	Congestion (238)	Agriculture (8)	Agriculture (7)

Urban Poverty – actors - issues



Urban Poverty – actors networks



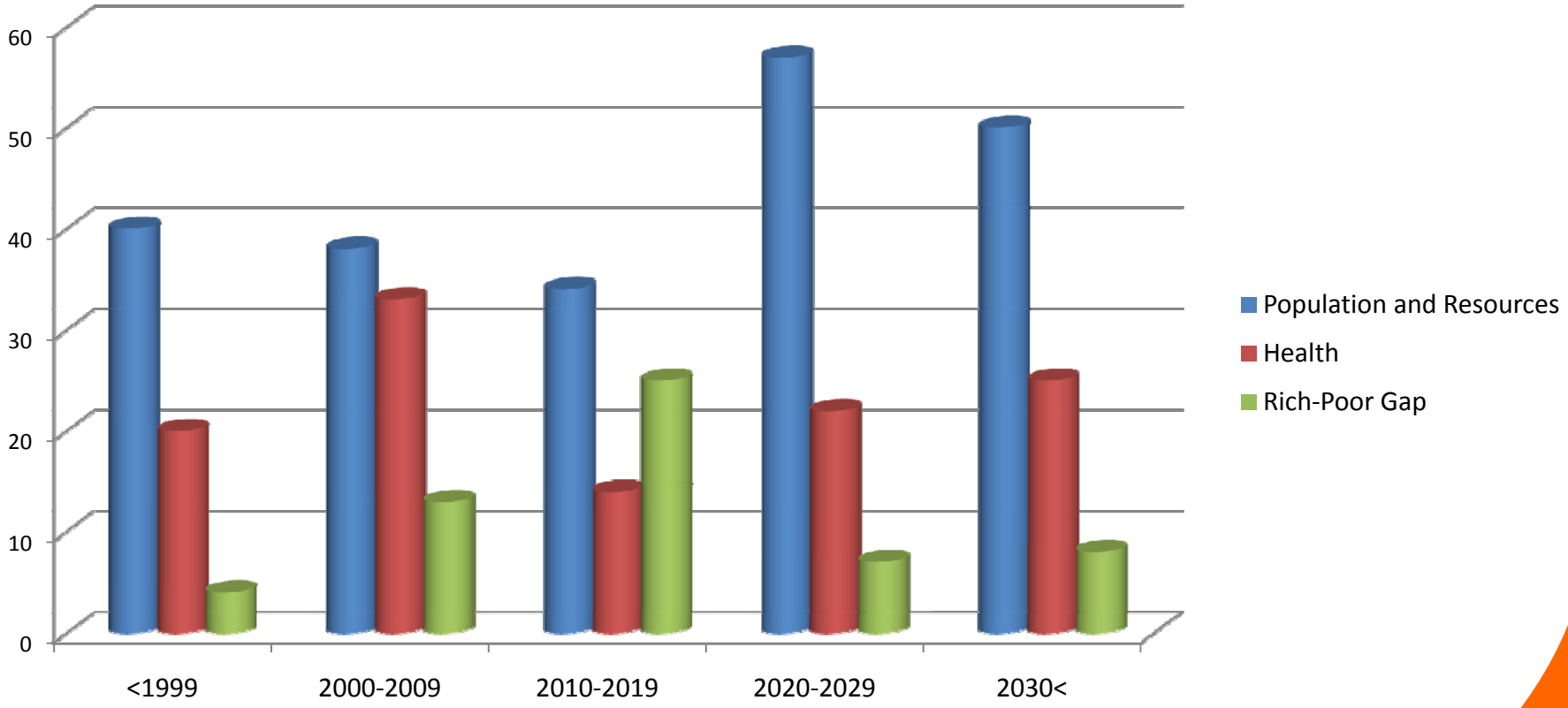
Urban Poverty – actors ranking

FREEMAN'S DEGREE CENTRALITY MEASURES

Diagonal valid? NO
Model: ASYMMETRIC
Input dataset: actors network (C:\Documents and Settings\msrelos2\D

		1 OutDegree	2 InDegree	3 NrmOutDeg	4 NrmInDeg
1	Government	2943.000	2943.000	6.914	6.914
2	Poor	2637.000	2637.000	6.195	6.195
3	Children	1208.000	1208.000	2.838	2.838
15	UN	922.000	922.000	2.166	2.166
6	Slum dwellers	650.000	650.000	1.527	1.527
5	NGOs	632.000	632.000	1.485	1.485
31	World Bank	477.000	477.000	1.121	1.121
9	Women	421.000	421.000	0.989	0.989
38	Hospitals	413.000	413.000	0.970	0.970
8	Farmers	400.000	400.000	0.940	0.940
19	urban population	330.000	330.000	0.775	0.775
26	Citizens	288.000	288.000	0.677	0.677
35	Rural population	286.000	286.000	0.672	0.672
48	Migrant workers	236.000	236.000	0.554	0.554
21	REDET	233.000	233.000	0.547	0.547
20	East African Com	233.000	233.000	0.547	0.547
25	EAC	233.000	233.000	0.547	0.547
22	African Union	233.000	233.000	0.547	0.547
24	COMESA	233.000	233.000	0.547	0.547
23	SADC	233.000	233.000	0.547	0.547
44	Students	218.000	218.000	0.512	0.512
43	Doctors	218.000	218.000	0.512	0.512
42	Industry	204.000	204.000	0.479	0.479
12	Labour force	191.000	191.000	0.449	0.449
13	Men	191.000	191.000	0.449	0.449
45	Schools	190.000	190.000	0.446	0.446
56	Middle class	180.000	180.000	0.423	0.423
62	Planning Commission	170.000	170.000	0.399	0.399
27	Private Sector	167.000	167.000	0.392	0.392
37	Homeless	160.000	160.000	0.376	0.376
33	World Food Prog.	152.000	152.000	0.357	0.357
34	USDA	152.000	152.000	0.357	0.357
11	Rich	151.000	151.000	0.355	0.355
66	Microfinance institutions	139.000	139.000	0.327	0.327
65	Building society	139.000	139.000	0.327	0.327
64	Water supply board	139.000	139.000	0.327	0.327
17	Tribes	139.000	139.000	0.327	0.327
16	Indigenous groups	139.000	139.000	0.327	0.327
63	Municipal corporation	139.000	139.000	0.327	0.327
18	Ethnic groups	139.000	139.000	0.327	0.327
53	USAID	138.000	138.000	0.324	0.324
52	FAO	138.000	138.000	0.324	0.324
55	EC	138.000	138.000	0.324	0.324
54	DFID	138.000	138.000	0.324	0.324
14	Society for Int Dev	138.000	138.000	0.324	0.324
51	OXFAM	138.000	138.000	0.324	0.324
61	WHO	133.000	133.000	0.312	0.312
60	Local government	133.000	133.000	0.312	0.312
40	Int. org.s	115.000	115.000	0.270	0.270
36	Communities	102.000	102.000	0.240	0.240
30	Aid donors	102.000	102.000	0.240	0.240
29	Municipalities	102.000	102.000	0.240	0.240
49	Political parties	99.000	99.000	0.233	0.233
58	Teachers	99.000	99.000	0.233	0.233
59	Nat. Council for Welfare	99.000	99.000	0.233	0.233

Urban Poverty - INDIA timeline analysis



"Development Initiative –
Rainwater Harvesting
As the water situation becomes critical across India, rainwater harvesting is seen as an important long term and sustainable solution.

April 2010

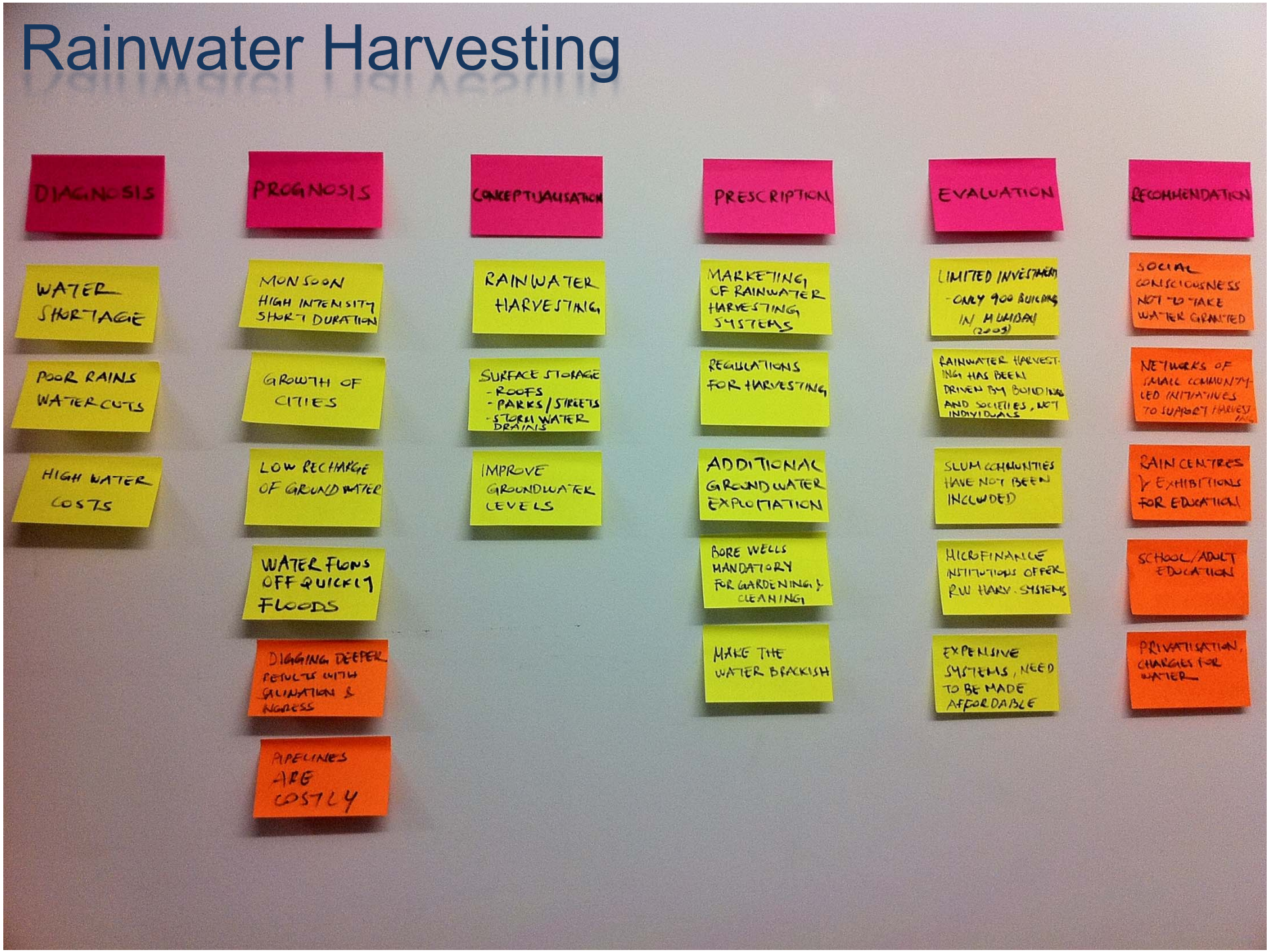
The vagaries of the monsoons in India dictate the performance of its economy. Poor rains spell water cuts for urban households in general. For the poor living in urban slums, it means that the water, which they buy illegally at a cost higher than that paid by the rich, just got dearer….."

DEMONSTRATION-LITE VERSION – FULL SYSTEM LINKS ARE NOT SHOWN

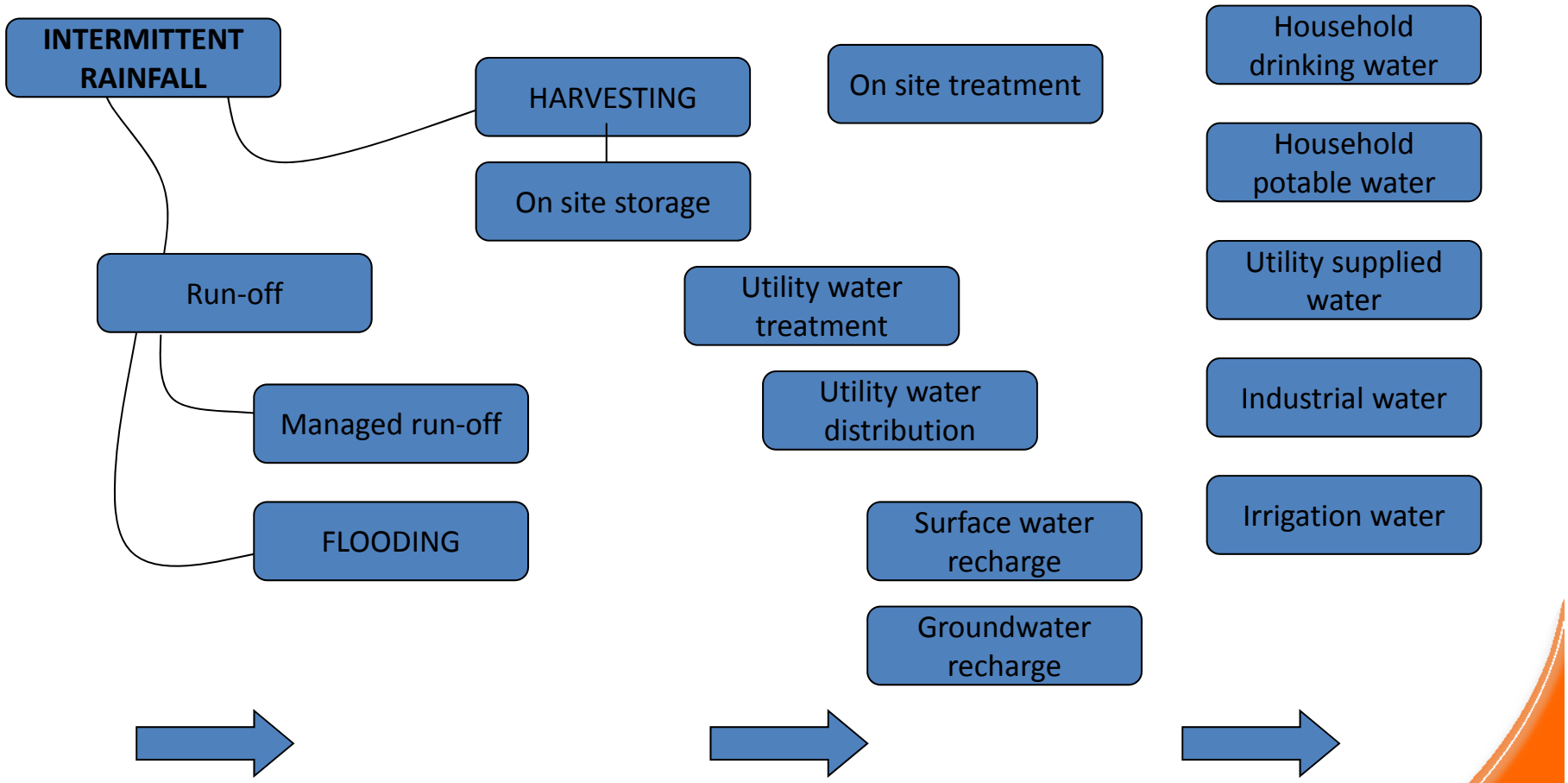
Systems mapping: step-wise approach

1) **Actor layer**
2) **technical layers**
3) **Political economy layer**
4) **Solutions & intervention points**
5) **Visualization**

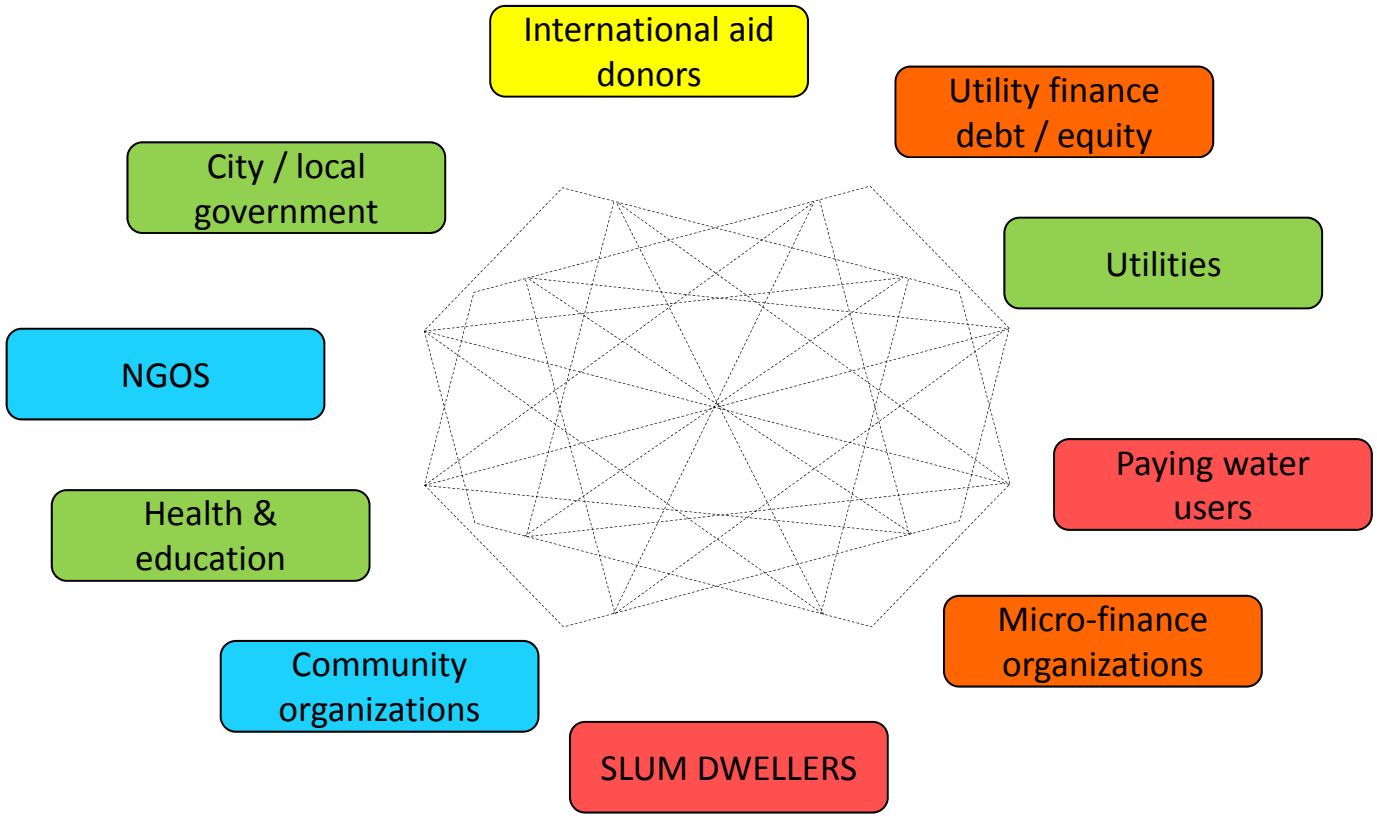
Rainwater Harvesting



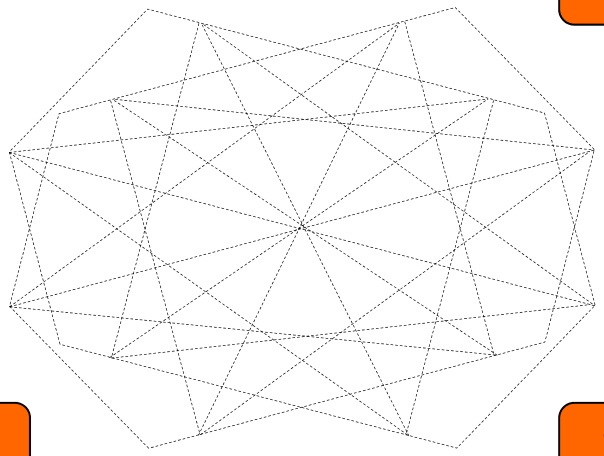
Water: Technical Systems



Water: Actor-Network Systems



Water: Political economy systems



Govt corruption & extortion

Govt deficit & loan conditions

Low tax base

Subsidiary of global utility

Lack of invest-ment finance

Privatized utility cost control

Liberalized health system

Water users enclave

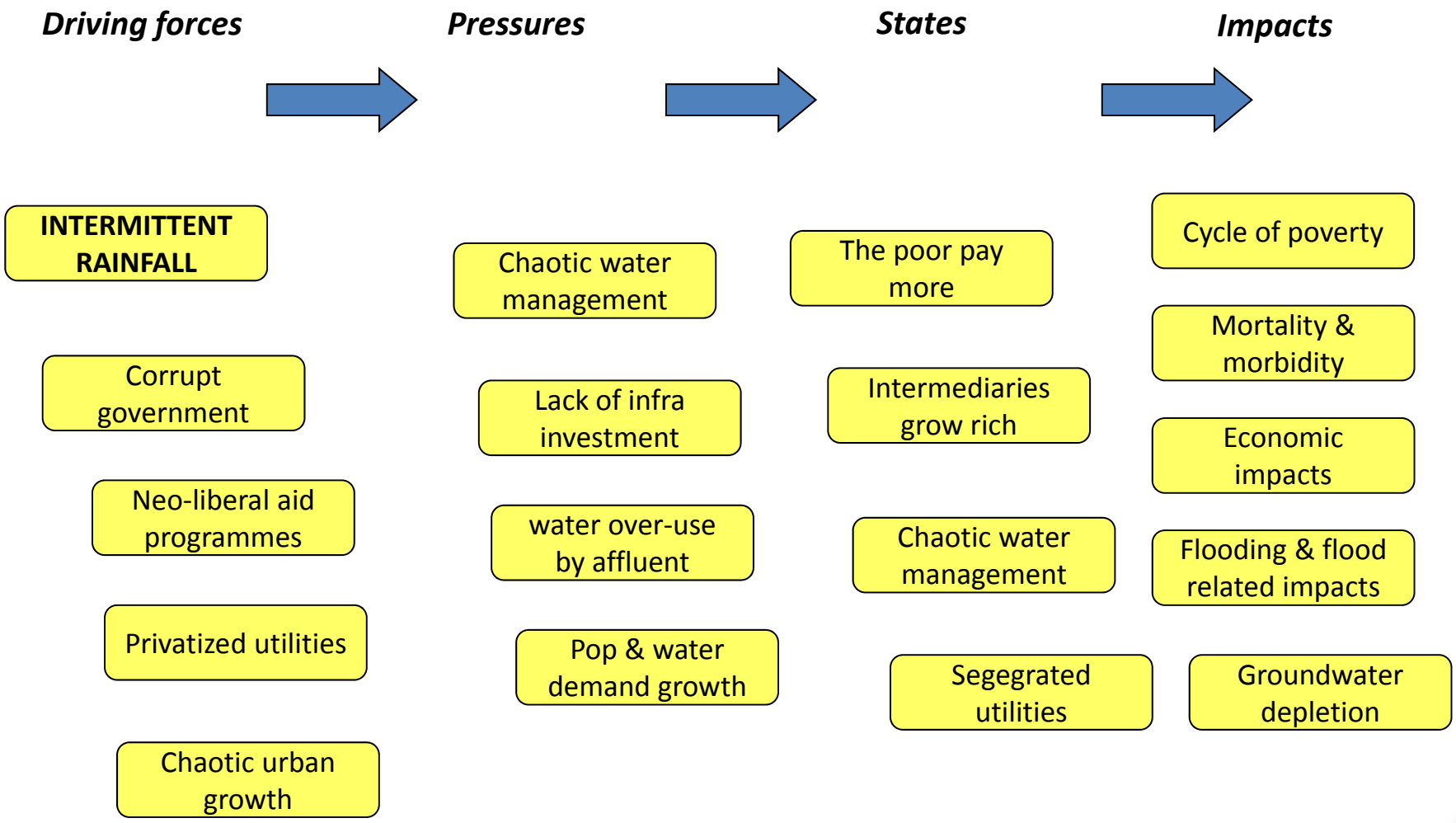
Underfunded NGOs

Street sellers & inter mediaries

Lack of tenure stops investment

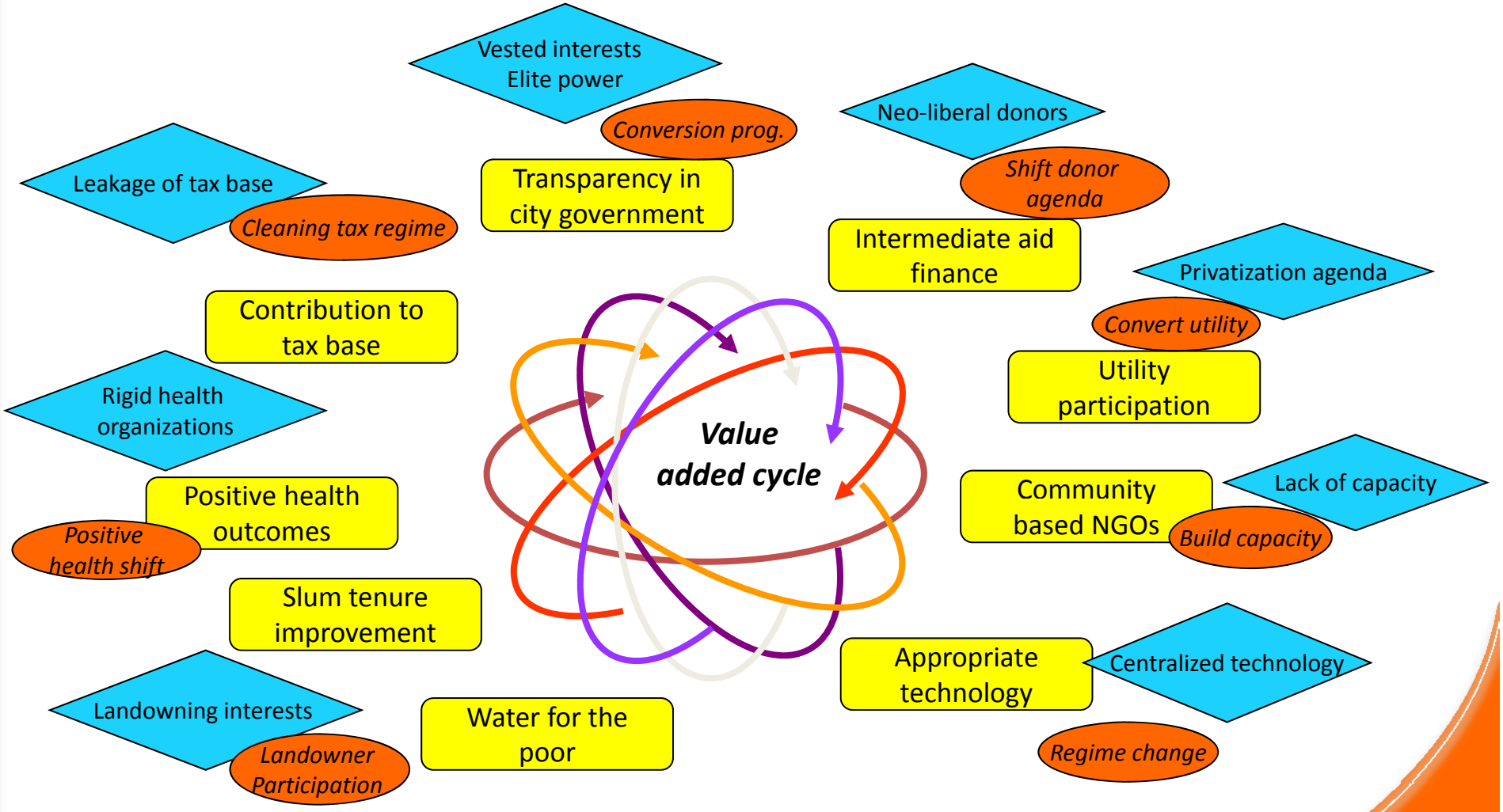
Highest prices paid by poor

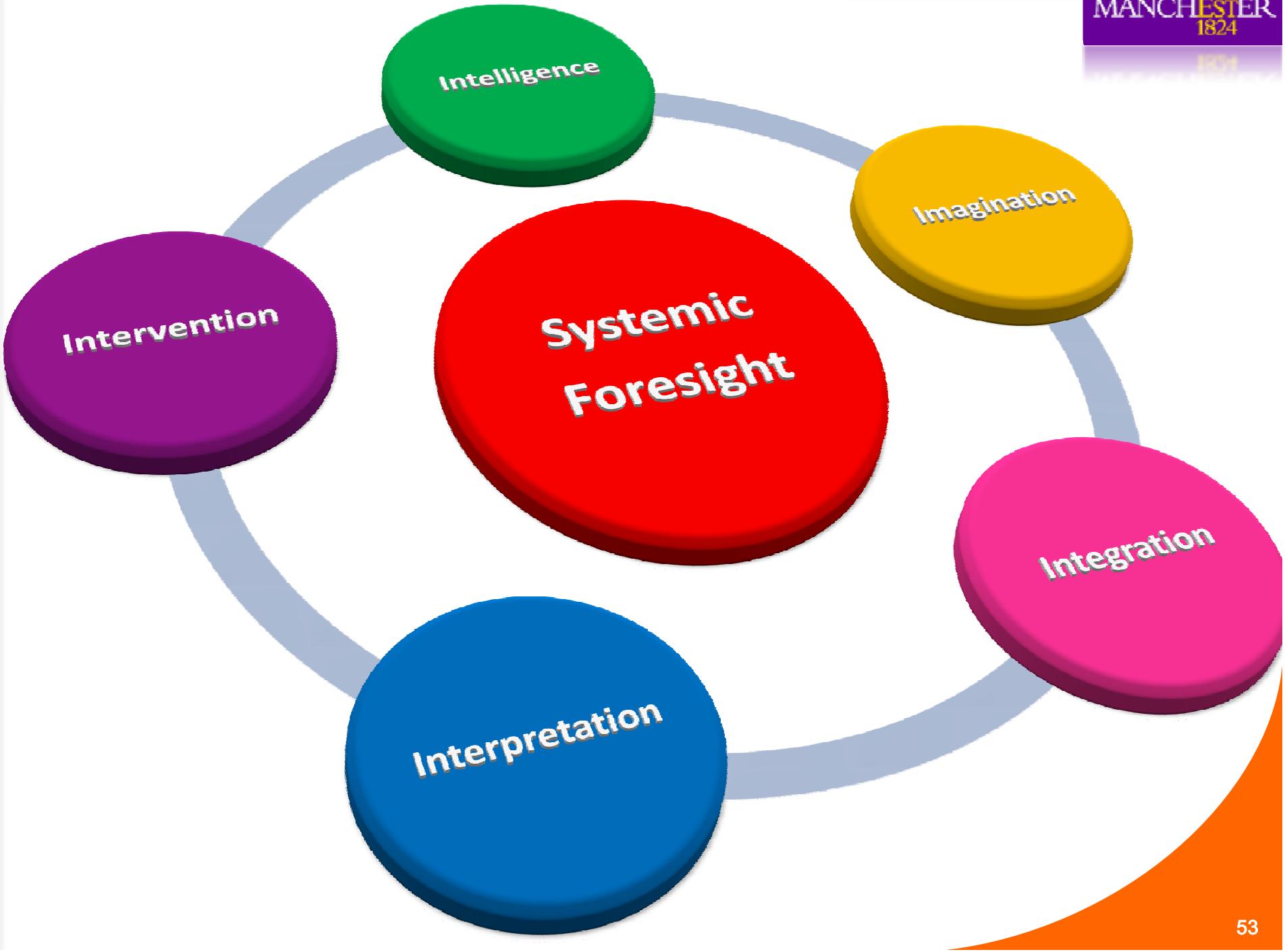
Water: Problem metabolism



Water: Solutions - Interventions

'solution cycle' of collective added value




Intelligence
Imagination
Intervention
Systemic Foresight
Integration
Interpretation

Modes of knowledge