

SYNERGISTICS – VISUAL PROCESS GUIDE: **‘RESILIENT CITIES & REGIONS’**

31-10-18

Details in the Practical Guide on www.urban3.net and
www.manchester.ac.uk/synergistics

OVERVIEW – RESILIENT CITIES & REGIONS

‘Resilience’ is a topical title for cities around the world. But there are critical questions on the meaning – resilience to what? for whom? where and when?

For the UN Sendai Framework, resilience is: *“The ability of a system, community or society exposed to hazards to resist, absorb, accommodate and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.”*¹ But what if the ‘community or society’ here is based on inequality and exploitation: resilience would simply return to the same gaps in power and wealth and social justice. For instance, affluent home-owners in a flood risk zone, tend to have more education and influence, so they would aim to channel the floodwaters downstream to other areas. And if the surrounding community has underlying tensions and traumas, (as most do), then risk / resilience is not only a technical ‘engineering question’ but a political question, where social cohesion and identity are maybe as important as official plans and policies.²

Much depends on the ‘frame’: whether a flood risk is seen only as water levels and flood walls, or, the human systems of governance, investment, information and skills, cultural learning and so on. The Synergistic Toolkit helps to see this kind of bigger picture, with a 3D framework – **‘wider-deeper-further’**:

- **‘Wider’** synergies between communities of actors and factors, (people or organizations or institutions): we can start by mapping the inter-connections and exchanges of the people around the table.
- **‘Deeper’** synergies between different value systems and logics: social, technical, economic, ecological, political and cultural. This is also about different knowledges – ‘know-what, know-how, know-who’ etc.
- **‘Further’** synergies between upstream causes, (literally up-river in the case of flooding), and downstream effects (downriver which gets the impact of our actions).

Then we can explore different levels of synergy and systems change, which highlight which kind of resilience we are talking about. These can also be framed as **‘clever, smart or wise’**: or otherwise, **“Mode I, II or III”** type operating systems:

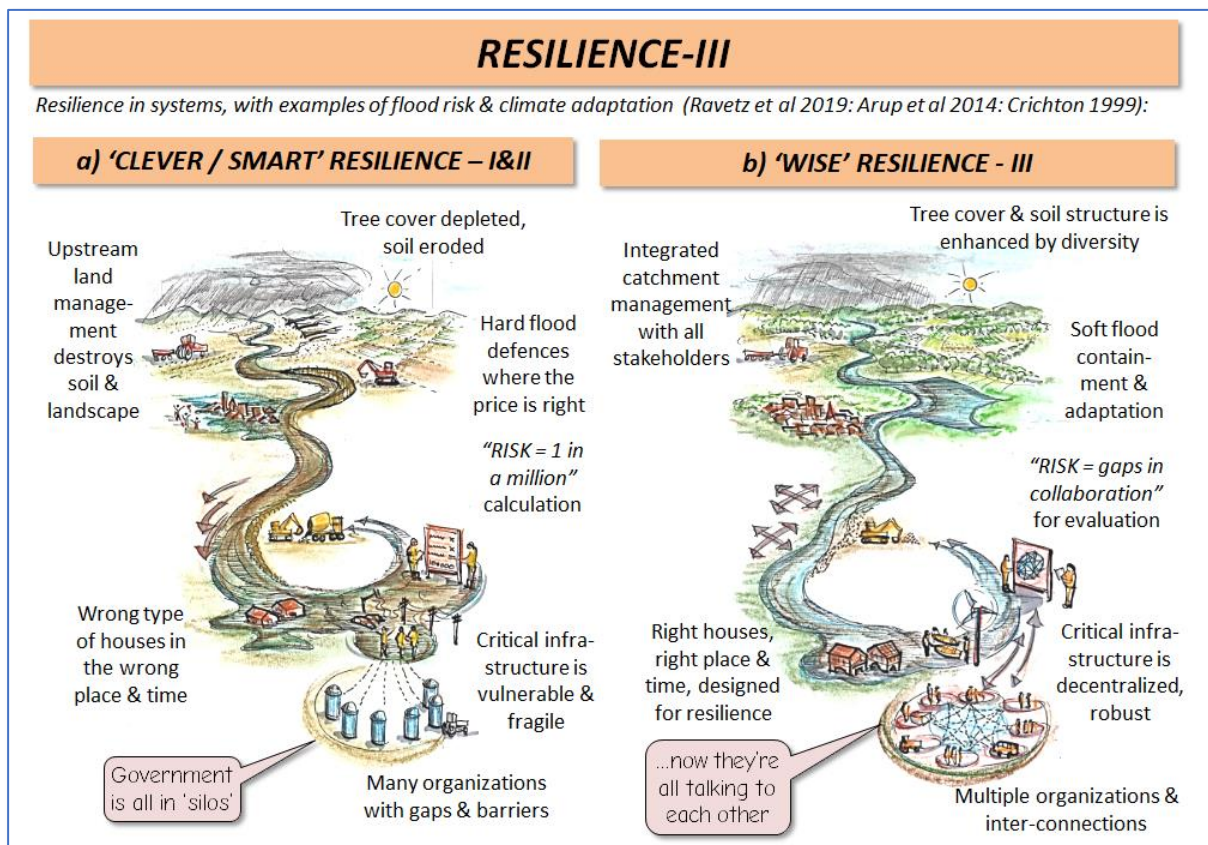
- **‘Mode-I’ (1.0): linear and ‘clever’**: here the synergy works as a ‘functional system’: it follows direct instructions and responds to short term pressures. A linear-type ‘Resilience-I’ strategy would build higher walls in response to flood risk.
- **‘Mode-II’ (2.0): evolutionary and ‘smart’**: here the synergy works as a ‘complex adaptive system’, evolving by self- selection and self-organization. Evolutionary type ‘Resilience-II’ looks for interactions between flood risk, property and infrastructure, with innovations, incentives and markets: but these often reinforce inequality and exclusion.
- **‘Mode-III’ (3.0): co-evolutionary and ‘wise’**: here the synergy works with co-learning, co-innovation and co-creation. A co-evolutionary ‘Resilience-III’ works on the cognitive level, and promotes shared learning

¹ Sendai Framework, UNSDR 2011: Sendai Framework for Disaster Risk Reduction 2015 – 2030. NY, UNSDR

² Beilin, R, & Wilkinson, C, (2015) Introduction: Governing for urban resilience. Urban Studies, Vol. 52(7) 1205–1217

and collective intelligence of all stakeholders. It aims beyond 'clever' flood defence, towards a 'wiser' co-evolution of urban systems with their climate systems.

Similar principles apply to parallel pathways, such as *Climate-III*, *Neighbourhood-III*, *Finance-III*, and so on. Each of these are highly inter-connected, and the 'synergistic pathways from smart to wise' can be mapped in each (see <https://urban3.net/urban-3-0-the-book/>)









To understand and work with this extended reality, we have to look at whole systems not just the parts, as in the *Resilience-III* cartoon here. This shows on the left, a linear / evolutionary model of low resilience: farmers destroy the retentive capacity, engineers design flood walls which send the waters downstream, houses are in the wrong place with the wrong design and government is organized in silos which don't communicate. On the right hand side, we see a synergistic community, with wider and deeper collaboration between farmers and foresters, engineers and entrepreneurs, residents and community leaders, architects and developers, insurers and financiers, public services and emergency services.

This is where 'reactive' risk assessment overlaps into 'pro-active' resilience strategy. For climate change impacts, there are human-environment thresholds and tipping points: storms increase in severity and unpredictability, and houses are built in floodplains or fire risk areas. The most vulnerable often lack insurance or protection, and human errors are amplified up by gaps, mistrust and paranoia. Such factors seem to accumulate self-reinforcing feedback, not only material (the height of a flood wall can be a tricky question) - but also cognitive and collaborative (how organizations learn and communicate, or not).

Such questions can also bring in other synergistic pathways to be explored (from *Deeper City* book), such as:

- *Adaptation-III*: living with climate change disruption, with new ways of co-learning between all actors;
- *Organization-III*: structures for enterprises and agencies with complex multi-functional roles.
- *E/Valuation-III*: working with wider and deeper forms of value – social, technical, ecological, political or cultural.

So - where to draw the line and boundaries – should we focus on the technical flooding problem, or a whole urban system problem of social cohesion, economic diversity and effective governance? The summary / self-evaluation table here can help.

Summary & self-evaluation: Resilience-III				
		Mode-I: Linear	Mode-II: Evolutionary	Mode-III: Co-evolutionary
		'CLEVER': (complex)	'SMART': (emergent complexity)	'WISE': (cognitive complexity)
	Social resilience	Social units	Social networks	Social intelligence
	Technical resilience	Mono-functional	Multi-functional	Integrated systems
	Economic resilience	Industrial production	Extractive capital	Holistic livelihoods
	Environ resilience	Defence for flood etc	Insurance markets etc	Multi-function ecologies
	Political resilience	Institutional regulations	Power games	Political nous
	Cultural resilience	Cultural objects	Cultural markets	Cultural civilizations

The self-evaluation / summary table here can be used to define the problem - whether lack of flood defence, or lack of social cohesion capacity. Then we discuss the changes in motion, positive and negative. Thirdly, we can use the table to structure discussion on visions and opportunities and synergies: and fourth, the possible pathways to meet them. This method can combine with the visual templates below, and also other tools - hi-tech / low-tech, people-centred / analysis, local / global focus, and so on. A pilot program was run in Melbourne 2017, with results on www.manchester.ac.uk/synergistics/collaboratorium/risk-resilience/

In the following pages we set out:

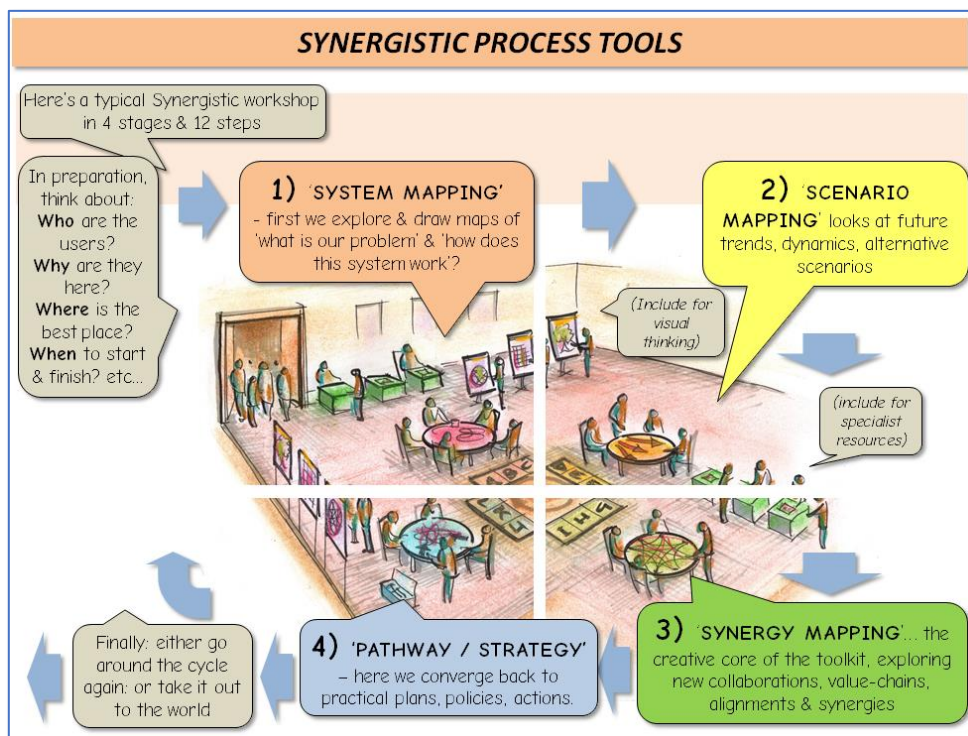
- An overview of the synergistic toolkit and method of use
- A visual thinking guide with templates and a worked example.

'Resilience-III' has to, somehow, connect environmental management with social, technology, ecology, economic, political and cultural issues. Meanwhile, 'grand challenges' such as artificial intelligence or social inequality, are even more 'hyper-complex', inter-connected, and controversial. What can be done?

'Synergistics' – the science and art of working with synergies – has been developed for such challenges. It provides practical methods and tools, to help explore and enable 'collective intelligence'. It can work in organizations, institutions, supply chains or value-chains, business / enterprise models, networks or communities.

To explore the potential for collective intelligence, calls for creative and visionary thinking. For this we use the Synergistic Toolkit, a flexible set of techniques with 4 stages and 12 steps:

- a) **System mapping:** the baseline syndromes and issues on the table: also includes 'co-learning':
- b) **Scenario mapping:** the drivers of change & alternative futures: ('co-knowledge'):
- c) **Synergy mapping:** design of opportunities, synergies, innovations: ('co-creation'):
- d) **Strategy mapping:** design of practical pathways, road-maps, policies & projects ('co-production').



The picture here shows all four stages in one big room (in reality each could be at a different time and place). The scheme is very flexible: it can take hours, days, weeks or months, depending on time, people and resources. The cycle can be more interactive, or more about desk-study, data-mining, expert debate, or stakeholder interviews. Overall these tools help to explore 'grand societal challenges': to identify 'what kind of problems' are we talking about: and then explore 'what kind of solutions' are most useful.

Visual thinking is at the centre of the synergistic methods and tools. This Guide provides a series of templates and typical questions, for each of the 4 stages and 12 steps.

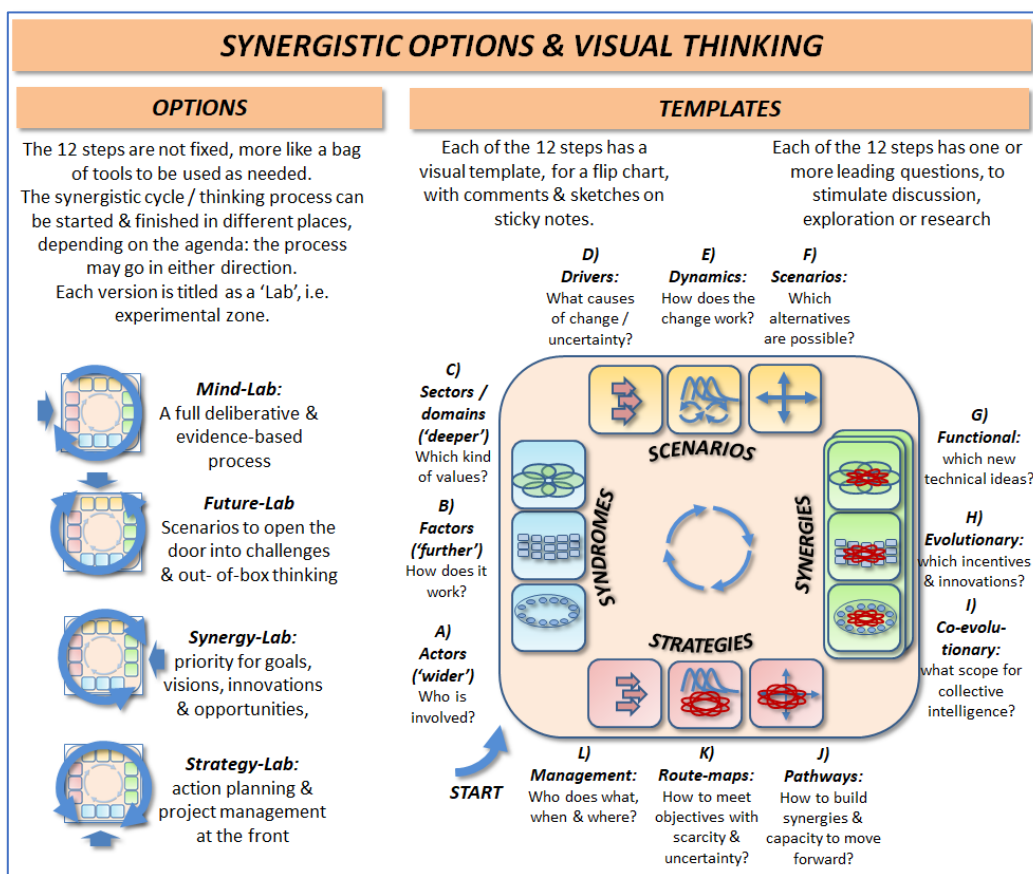
VISUAL THINKING AND VISUAL TEMPLATES

These visual templates provide a easy and practical structure for building and visualizing complex information, i.e. concept maps / systems maps / *deeper-mind* maps. (these are different to *mind-maps*, as they focus on collective intelligence with multiple agendas).

The templates can be easily copied onto flip charts with writing or images on sticky notes. The order of using the templates depends on the theme, the event, the participants etc. Sometimes we start with the Scenario Mapping (D,E,F): in others we start with Synergy Mapping (G,H,I).

Overall, visual thinking is one of the best ways to explore creative, out-of-the-box, inter-connected ideas.

- Participants are asked for visual ideas or small sketches, to be completed by a graphic facilitator.
- Participants can respond to 'future cards', 'scenario visions', or other visual inputs
- Participants are encouraged to draw concept mappings, using the visual templates.
- The templates are very flexible, and can be used in a creative open-minded way.
- If participants don't agree on the images or mappings, each can do their own version.
- The templates in stage 1 & 3 are focused on the development of collective intelligence.
- The templates in stage 2 & 4 fit with mainstream futures / scenario methods: and with standard route-mapping / project management methods.



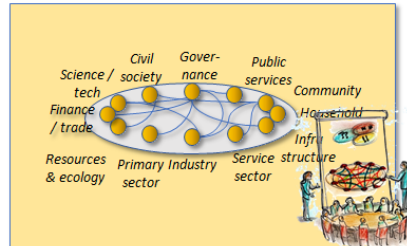
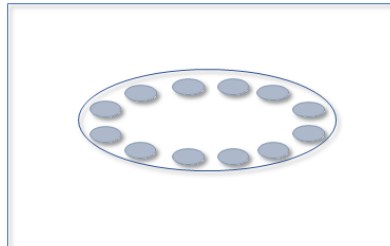
Each of the 4 stages and 12 steps is shown in the following pages, with likely questions to be addressed, and with cues for visual thinking methods. The graphics on the left side are blank templates (to be copied onto flip-charts or similar). The graphics on the right side are worked examples (based on a low-carbon agenda).



A) ACTORS MAPPING – ('WIDER' SYNERGIES): 'ROUND TABLE' TEMPLATE

- Q: Who is involved?
- Q: how do they interact?

Identify the most important people, stakeholders, communities: explore their roles & relations (social, economic, political etc).

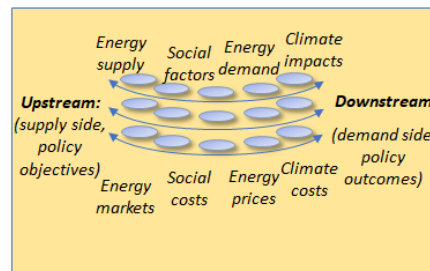
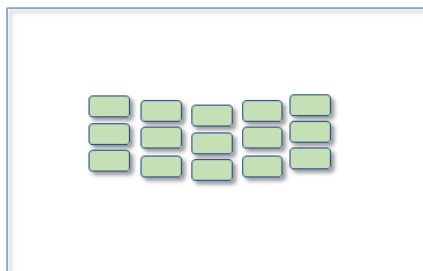


B) FACTORS MAPPING – ('FURTHER' SYNERGIES): 'BUSINESS MODEL' TEMPLATE

- Q: How does the system work?
- Q: Where are the upstream / downstream factors?

Explore the metabolism or flows (resources, money, policy, labour, social value etc):

Look for upstream causes / downstream effects of the flows, (e.g. ecological / social impacts)

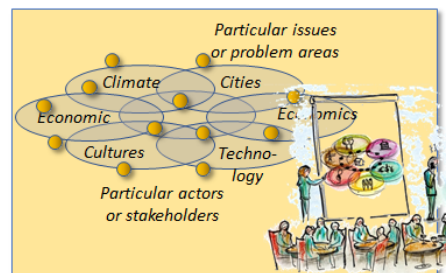
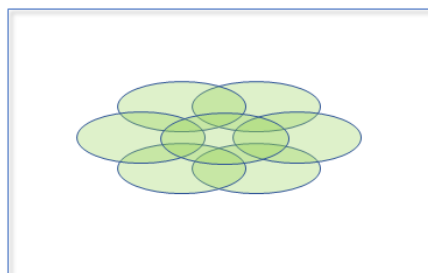


C) DOMAIN MAPPING – ('DEEPER' SYNERGIES): 'CLOUDY CRYSTAL BALL'.

Questions to be addressed:

- Q: Why is this project important?
- Q: Which values & domains are involved?

Explore what kind of problems & what is the scope: which are the goals / visions? (social / technology / economic / environment / political / cultural etc).



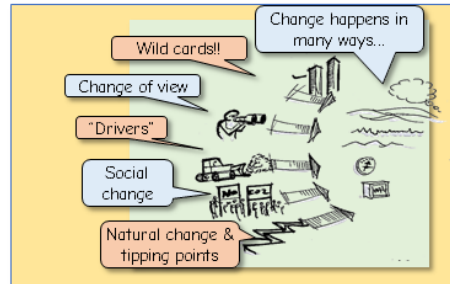
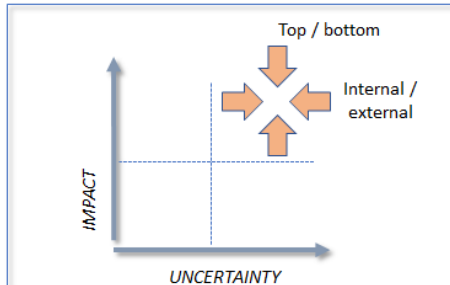
TOOLKIT STAGE 2: 'CROSSROADS' (SCENARIO MAPPING): 'WHAT'S CHANGING?'



DRIVERS - 'FORCE FIELDS' TEMPLATE

- Which forces of change?
- Which uncertainties?

Identify each kind of change, for impact & uncertainty. Select the top 2 or 3 most important changes.

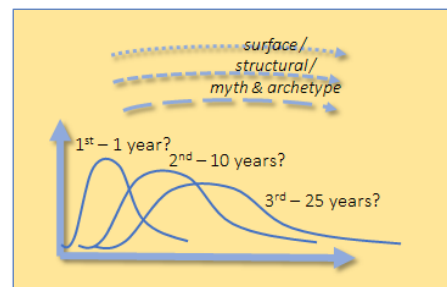
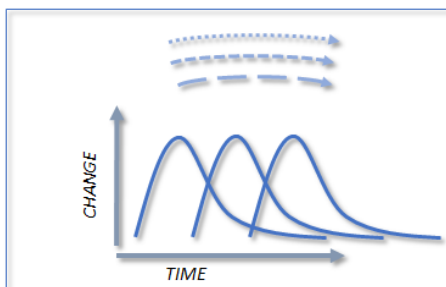


D) HORIZONS - '3 MOUNTAINS' TEMPLATE

- When are the horizons of each change?
- Which are surface / structural / archetype changes?
- When is there growth / decline / restructuring?

Explore which are short / medium / longer term changes:

Explore the patterns or cycles of change

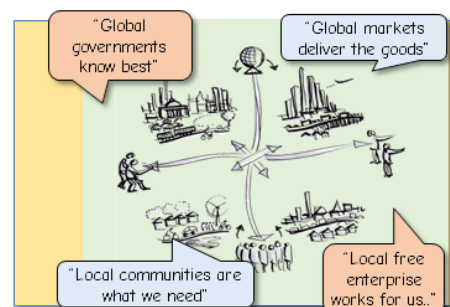
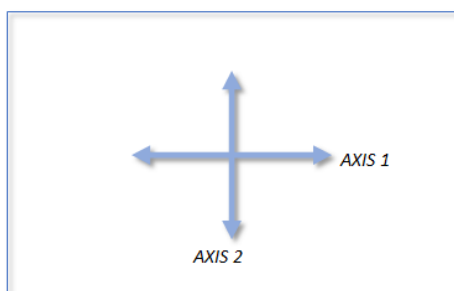


E) SCENARIOS - 'CROSS-ROADS' TEMPLATE

- What if the best / worst happens?
- Which are the most 'interesting' alternative futures?

Explore 'what-if' the top 2/3 changes are high / low impact, positive / negative.

Explore the scenarios with stories, headlines, images.

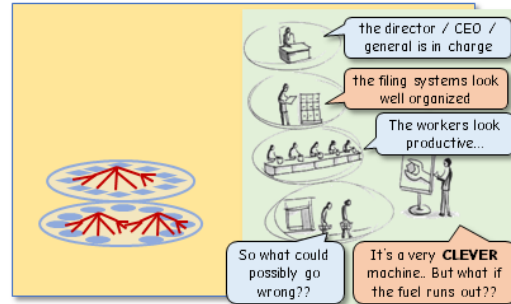
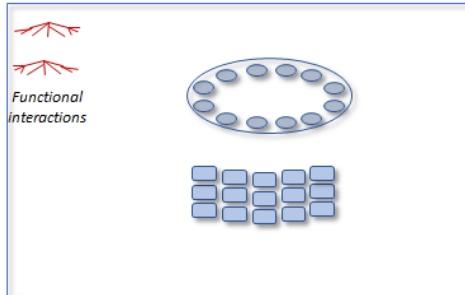




F) LINEAR – (MODE-I) - 'CLEVER IDEAS' TEMPLATE

- How to improve the functions & operations?

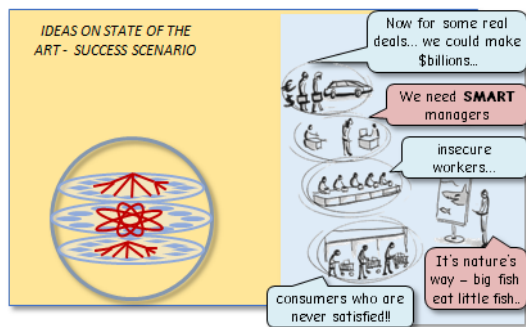
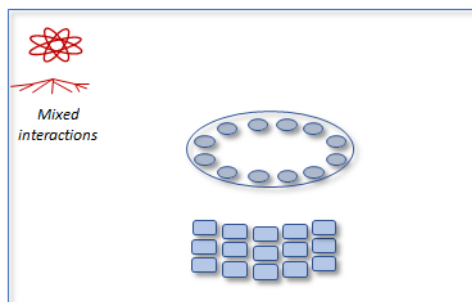
Explore practical ideas & synergies between the 'actors' & 'factors' (social / technology / economic / environment / political / cultural etc). Draw the possible inter-connections.



G) EVOLUTIONARY (MODE-II): 'SMARTER IDEAS' TEMPLATE

- How to make smarter inter-connections?

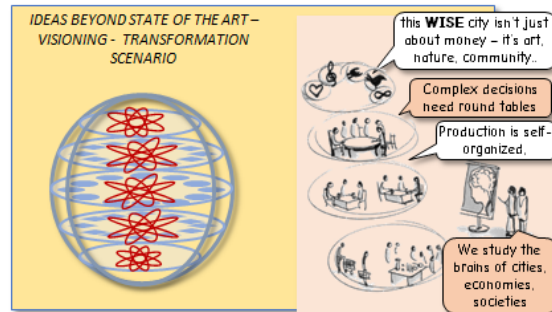
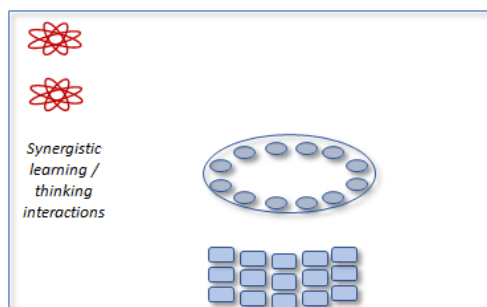
Explore the state-of-the-art entrepreneurial ideas & synergies between 'actors' & between 'factors'. Draw the possible inter-connections.



H) CO-EVOLUTIONARY (MODE-III): 'WISER IDEAS': TEMPLATE

- How to grow a wiser kind of intelligence?

Explore beyond state-of-the-art 'visionary' ideas & synergies, between different 'actors' & 'factors'. Draw the possible inter-connections, with multiple layers.



TOOLKIT STAGE 4 - 'ROUTE-MAPS': (STRATEGY MAPPING): 'WHAT'S TO BE DONE?'

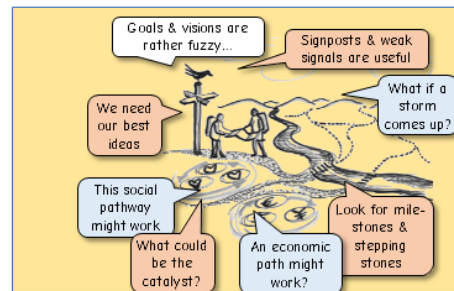
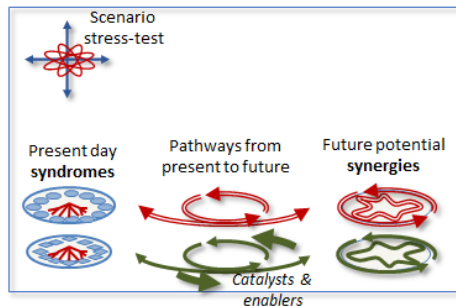
(J) PATHWAYS - 'PATHWAYS'

- Which pathways could best realize the opportunities??
- Are these future-proofed?



Develop 'pathways' of strategic change, which connect the most robust ideas / synergies (internal / external: short /medium / longer). (there are different formats to show the pathways)

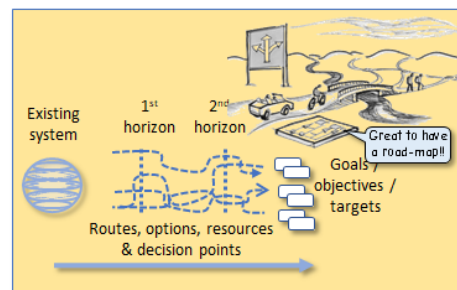
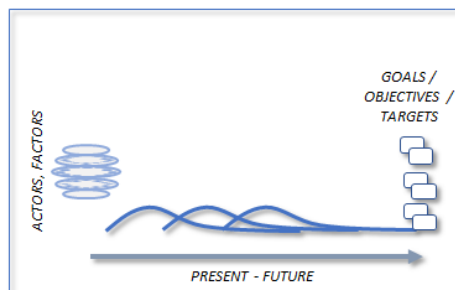
Test the best ideas / synergies against each scenario: & select the most robust.



(K) ROUTE-MAPS - 'ROUTE-MAPS'

- What strategies could turn the pathways into reality??
- When are the key stages?
- How much resources are needed?

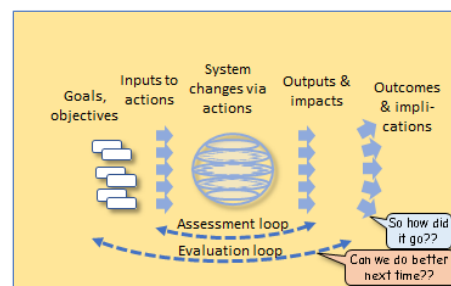
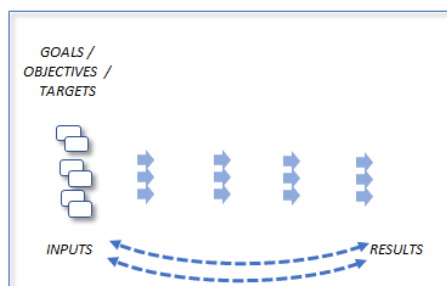
Identify the goals & objectives: Identify links to plans & actions, actors involved, factors & resources needed. (internal / external: short /medium / longer)



(L) MANAGEMENT/ EVALUATION - 'ACTION PLANS'

- How to manage the actions?
- How to evaluate the results??

Set up management plan with practical priorities & actions: Identify the next steps with actors & resources: Explore how to monitor performance, evaluate results & feedback.



ANNEX: SUMMARY TABLE

This table is a summary of the 12 steps in the Synergistic Toolkit, with key questions to be addressed, & examples of urban development. Note the steps can follow in different orders (not always A, B, C)

	KEY TASKS	KEY QUESTIONS	URBAN EXAMPLE
SYSTEM / SYNDROMES			
A) Scoping	Explore the scope of the problem / system /issue / agenda / problematique...	what is the agenda or problem for today: where are the boundaries?	<i>What is the scope & agenda: housing / infrastructure / public space?</i>
B) 'Wider' synergies	Explore how the system works, , and the relations of the actors in the system,	how do the actors / factors interact: what kind of system, hierarchical or networked?	<i>E.g. who are the key actors- investors /owners / developers / designers / residents?</i>
C) 'Deeper' synergies	Map the overall 'metabolism' of the system, with inter-connections between domains.	Which are the key domains e.g. social / technical / economic / ecological /political ?	<i>What are the main forces shaping behind the peri-urban syndromes</i>
SCENARIO MAPPING			
D) Drivers	Explore the forces of change, both external and internal.	what are the driving forces of change, uncertainty, internal / external, near / far horizon?	<i>What are key drivers of change & uncertainty ('21 drivers')</i>
E) Dynamics	define the most significant dynamic cycle effects.	what dynamics of change – succession / renewal / tipping points / transitions?	<i>How does the cycle of renewal work here: (e.g. development / conservation / restructure?</i>
F) Scenarios	explore alternative futures with structured 'what-if' questions.	which projections and scenarios are most relevant & plausible?	<i>How could the future peri-urban be different from today?</i>
SYNERGY MAPPING			
G) Linear mode-I	map the system qualities which are more linear & mono-functional	what opportunities for functional efficiency & performance of the system? Any negative effects?	Is the key peri-urban issue linear growth? (housing, services, infrastructure etc)
H) Evolutionary mode-II	map the qualities which are evolutionary & inter-connected.	opportunities for creative enterprise, new functions & niches? Any negative effects?	Is the key peri-urban issue adaptation / evolution? (housing, services, etc...)
I) Co-evolutionary mode-III	Map the qualities which are more co-evolutionary & synergistic	how can opportunities emerge via synergistic collaboration, co-learning & social intelligence?	Is the key peri-urban issue co-intelligence / co-evolution? (housing, services, infra, etc...)
STRATEGY MAPPING			
J) Pathways	look for synergistic pathways, to link between present 'syndromes' & future 'synergies'	which synergistic combinations can form pathways to bring actors/ factors into alignment & added value.	<i>How to make real positive change in the peri-urban? (housing, services, infra, public realm...)</i>
K) Road-maps	look for synergistic links between objectives, resources, actions, enablers.	which pathways, actors and factors can be combined into practical strategies & actions? what implications for resources?	<i>Which resources, actions, timescales to realize these? (housing, services, infrastructure, public realm...)</i>
L) Management / Evaluation	rational /relational management methods with assessment & evaluation.	how can results be evaluated, with feedback & learning into the next cycle?	<i>How to learn: before, throughout & following the urban policy process?</i>