

# European Alliance Against Coronavirus

Monday 6<sup>th</sup> July 2020 at 8:30

## Resilience from a multi-level network perspective

Working format is based on “Gilles Rules”:

1. conceptual framework
2. needs and disruptions
3. solutions

Speakers:

- Céline Rozenblat, Université de Lausanne

[Link to session's recording](#)

### 1. CONCEPTUAL FRAMEWORK

#### Resilience from a multi-level network perspective

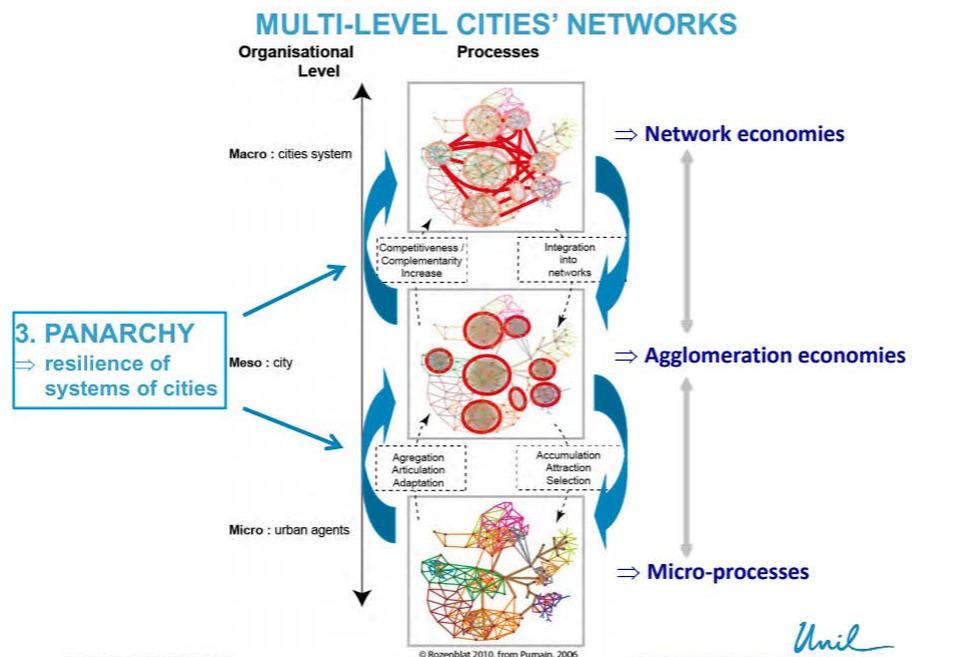
The session took a deep look at the concept of resilience from a multi-level network perspective. Prof. Céline Rozenblat, from University of Lausanne, opened the session explaining the concept using the example of city networks. The project “United Nations Habitat III (2016) - 2030 Agenda”, which involved 5,539 statements and 467 stakeholders with 359 meetings, mapped the connectivity of cities. The theoretical approach includes four main dimensions: organizational, spatial, physical and functional. Moreover, the theory approaches the resilience concept from several points of view: political, social, economic, technological and natural.

A city can be compared to a cluster, with many network and connections between different actors that share information in order to create an urban system. The city networks can be explained such as a multi-level networks with two different approaches (i.e. top-down and bottom-up) and three level: (i) micro, (ii) meso and (iii) macro.

Looking at the three levels in more detail:

- The micro level develops micro processes in order to create a very cohesive community. All the actors are collaborating with different member of network (**micro-processes**)
- The meso level develops network economies generating connection between different continents that - within themselves - develop cohesion with different cities (**agglomeration economies**)
- The macro level is the last one and develops the resilience of systems of cities (**network economies**)

Based on these three levels, the concept of panarchy was introduced: it is the hierarchical (multi-level) structure in which systems are interlinked in “never-ending adaptive cycles” of growth, accumulation, restructuring, and renewal. This “adaptive” cycles, whose strength is the coordination between different levels, are the core of resilience.



During the meeting, Céline presented various examples of concrete network resilience (i.e. Russia, China and France, see presentation).

### Resilience and interdependency

During the discussion, the attention was focused on how to foster and measure resilience. To make networks strong, one possibility is to develop interdependence (“Interdependent similar networks are more robust to random failure than a randomly independent network”). Interdependence allows two similar sectors to collaborate with each other and to develop projects and to find solutions that in turn could involve other sectors. In this way, it is possible to create links that lead to the development of a network. This network then allows the involvement of many actors and stakeholders and the development of resilience.

### Resilience and the Artificial intelligence

The potential of Artificial Intelligence is definitely one of the most promising topics. AI could especially be interesting for measuring the potential of linkages.

### Links shared during the discussion

- Measuring of economy in real time:  
<https://www.imf.org/external/pubs/ft/fandd/2018/09/harvard-economist-raj-chetty-profile-people.htm/>  
<https://opportunityinsights.org/>
- Guidelines from OECS on resilience systems analysis:  
<https://www.oecd.org/dac/Resilience%20Systems%20Analysis%20FINAL.pdf>

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## 2. IDENTIFICATION OF DISRUPTIONS

### First disruption: analogy between city network and cluster network for a resilience perspective

Source: Céline Rozenblat, Université de Lausanne

**Evidence:** Resilience in multi-networks is a concept that has been analysed for a long time. In this morning's session it was highlighted how there can be an analogy regarding the analysis and optimization of resilience between city networks and cluster networks. The resilience that can be built for cities is the same that can be built for clusters because it is based on a network of relationships between interconnected networks (density, diversity and network capacity).

**Geographical impact:** EU

**Stage of value chain:** cluster network

**Character of the disruption:** resilience analysis in a multi-level perspective

**Time frame:** medium – long term

**Recommendation:**

- Resilience is one of the three main goals of European long-term strategy (Green, Digital, Resilient).
- The quality of communication within networks is very important. Most individual actors do not have a strategic overview over the networks they are part of. This overview is difficult to maintain and changes very quickly. For this reason, it is necessary to always generate updated information, even if there are delays for the data. From this point of view, Artificial Intelligence can help the construction of possible evolution scenarios. Even during the COVID pandemic, it is evident that communication needs to flow.
- It is fundamental to be able to measure resilience, that is a critical point. There are several studies and works related to resilience measurement and several indicators can be used (e.g. GDP, population growth, unemployment, and many others). Attention has to be paid on the balance between local indicators (more details) and global indicators (they allow to make comparisons).
- Cluster managers need to know how to apply network tools and scientists should be aware of clusters so that they are included in the mappings

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## IDENTIFICATION OF NEEDS

1) Skills development and training: cluster managers, policymakers, and scientists must come together and skills must be developed, to collaborate to map networks across disciplines and to develop tools. The greater the skills that are developed, the stronger the collaborations can be.

2) Development of tools and methods for analysis, optimisation and measurement of multi-level network resilience, for cluster managers and policymakers