



Modelling the complex system of the response to a natural disaster by a multilayer network approach

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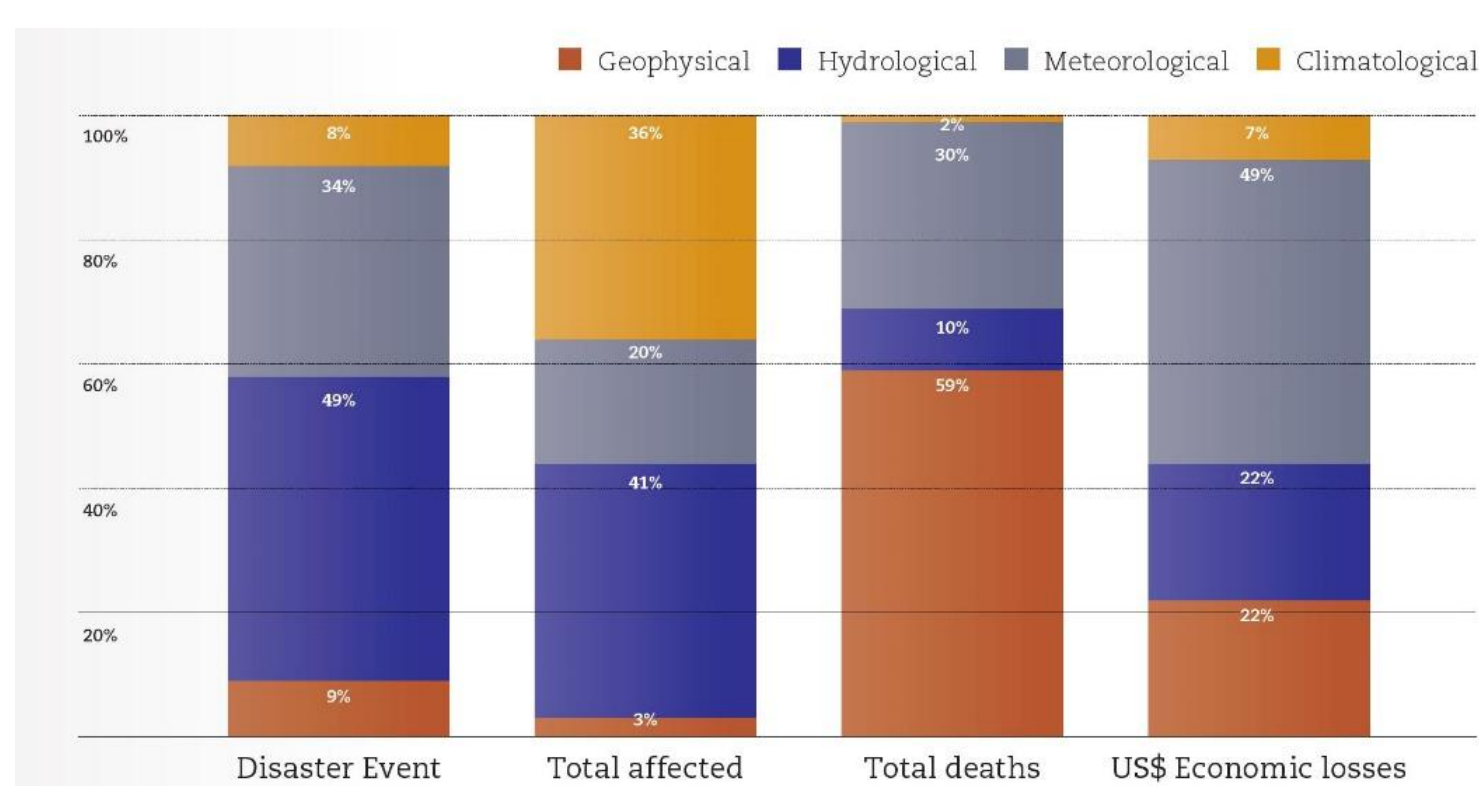
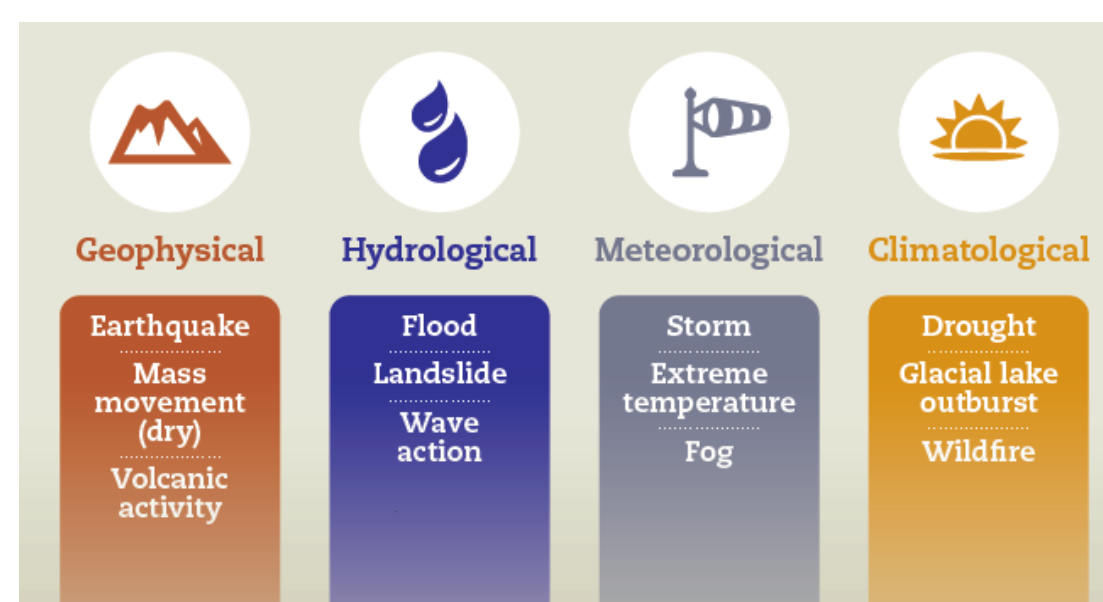
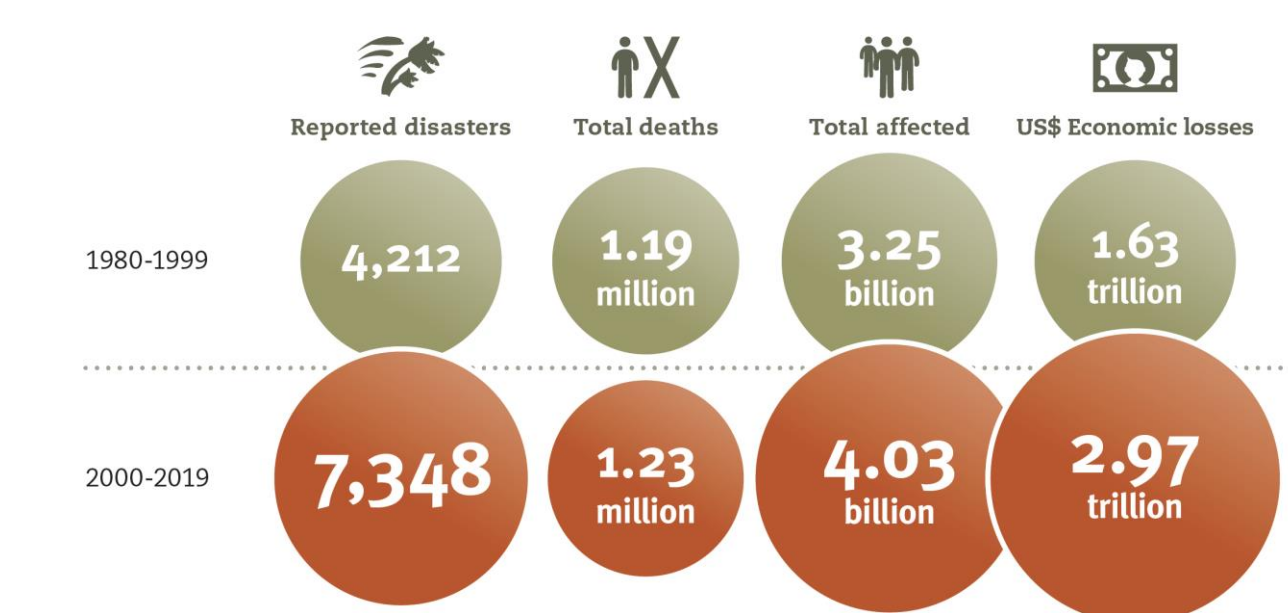
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Modelling the complex system of the response to a natural disaster by a multilayer network approach

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CONTEXT



Impact of disasters

Humanitarian crisis response involves :

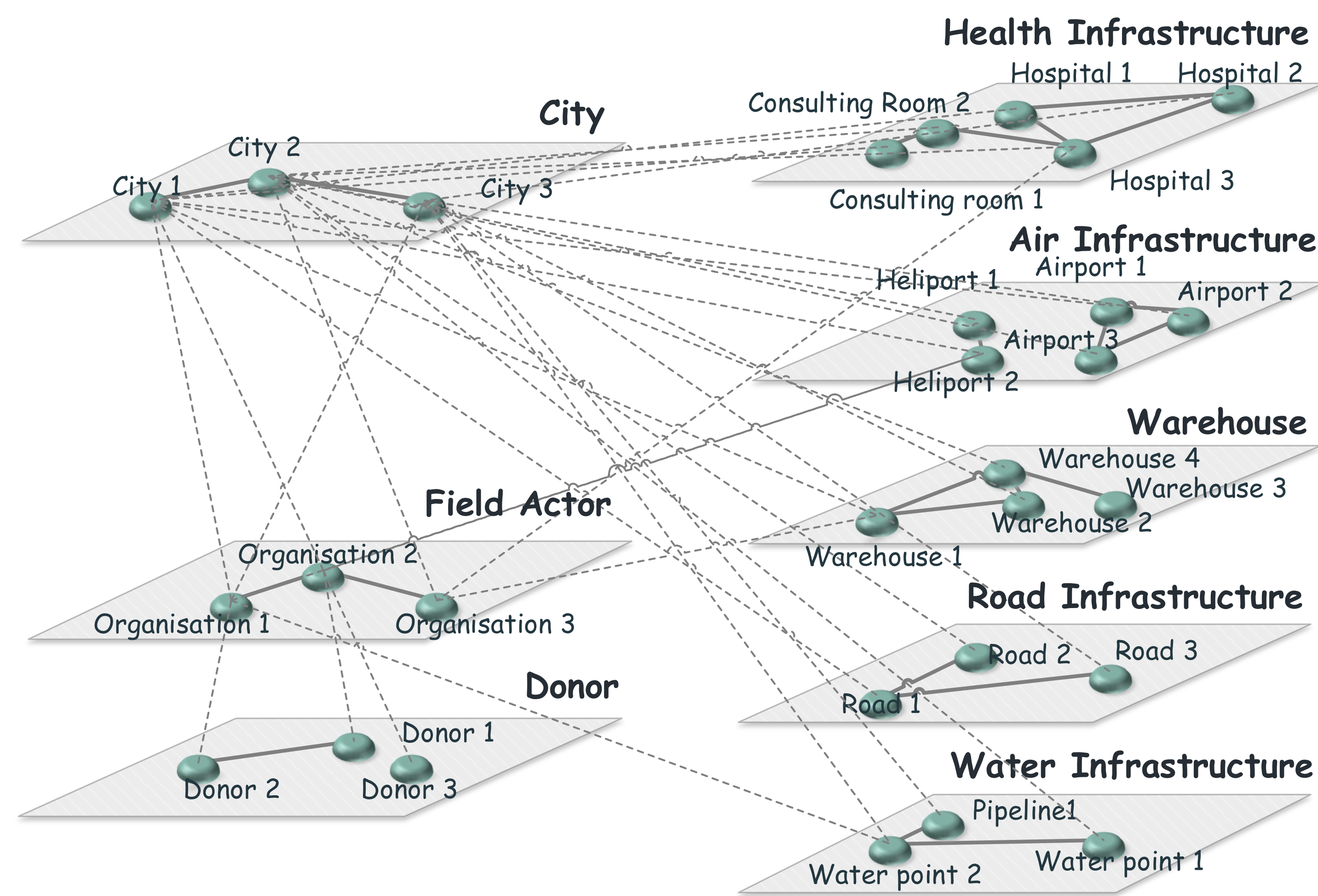
- Many entities of various types
- High diversity of field actors (international organizations, local NGOs, army, governments ...)
- Infrastructures (air, health, water, road, telecom ...)
- Transportation means
- Affected populations
- Available resources.

The complexity of a humanitarian crisis makes its global vision difficult.

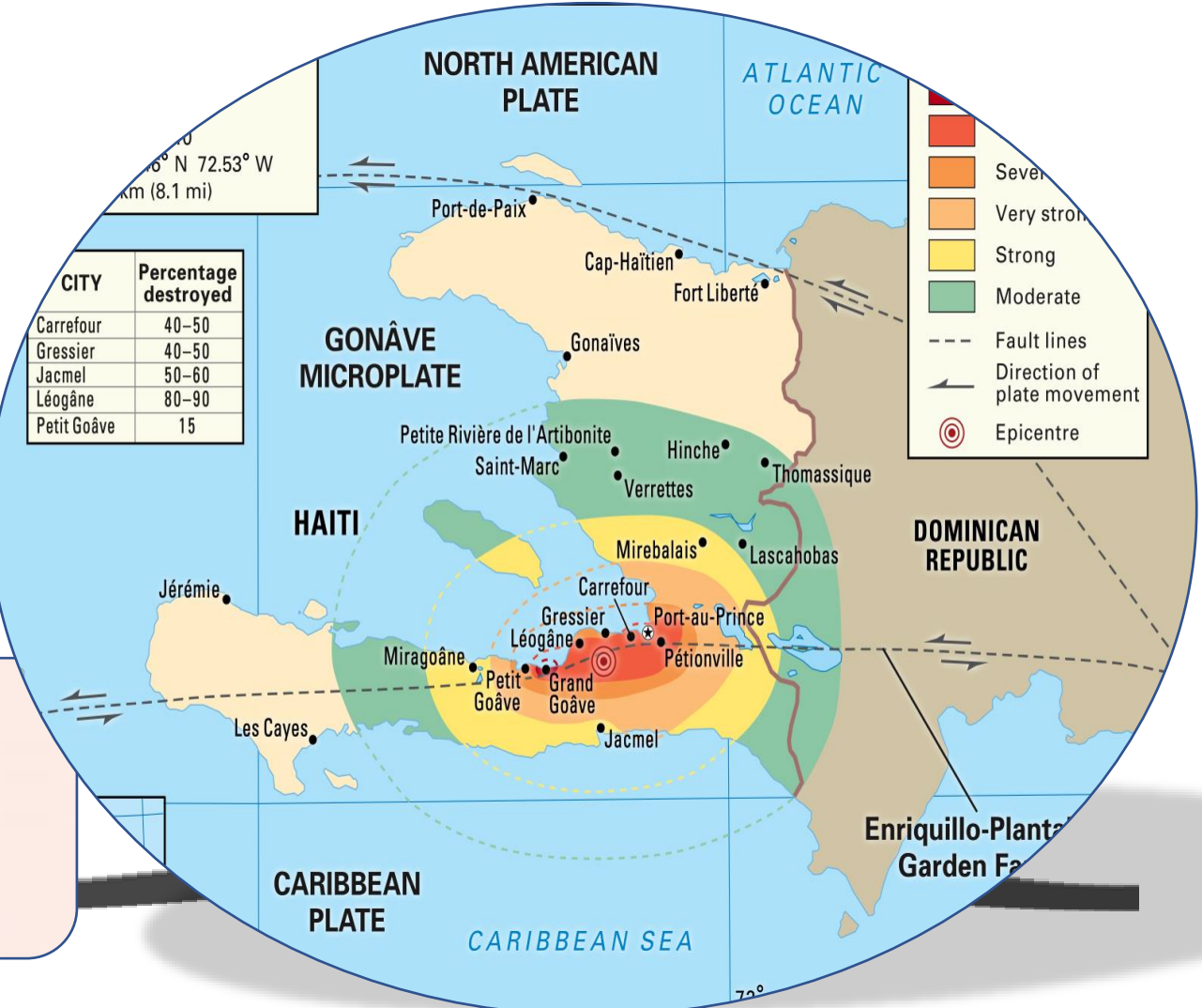
PROBLEMATIC

How to provide an exhaustive view of the situation ?

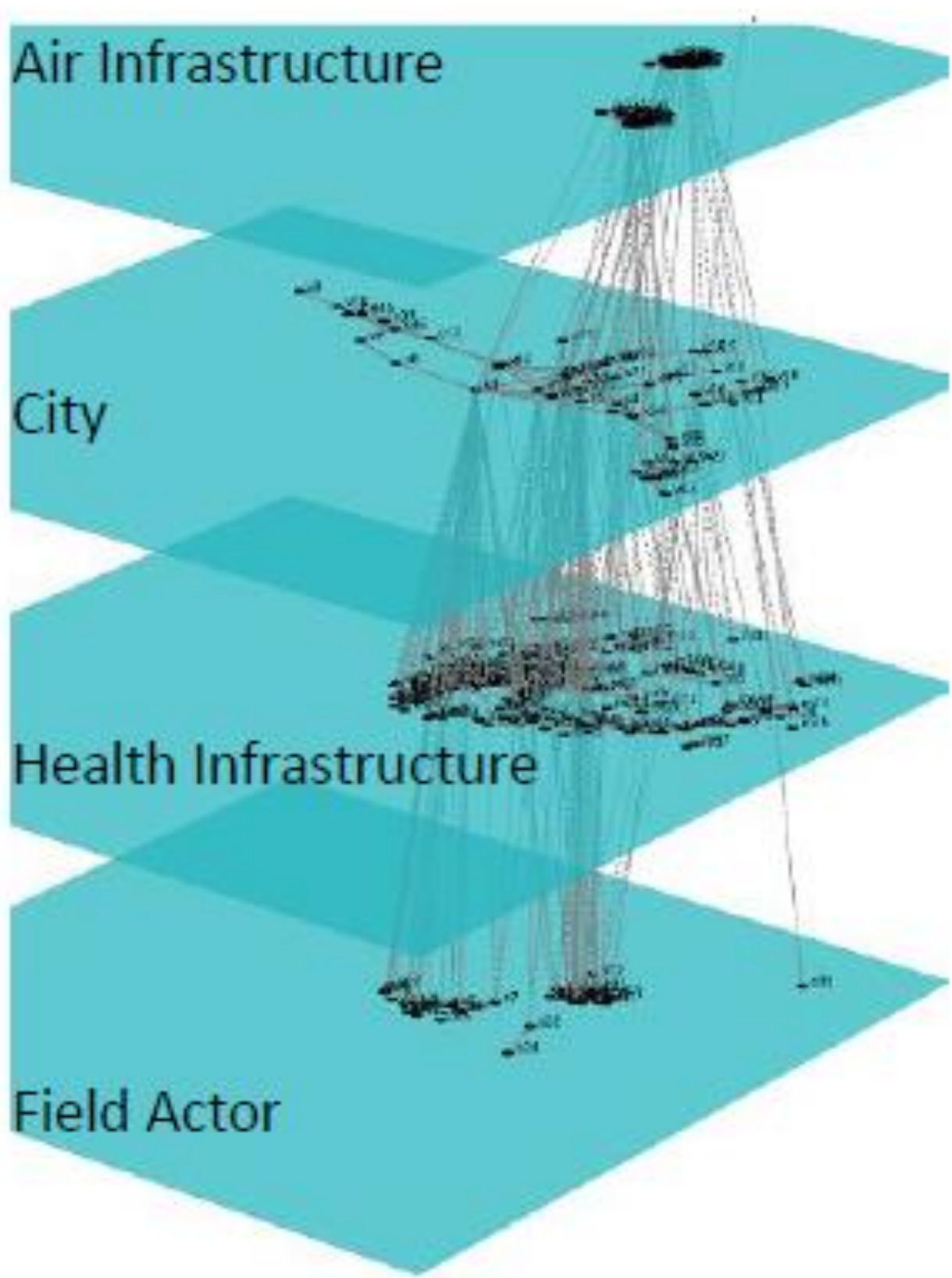
MULTILAYER NETWORK MODEL



CASE STUDY

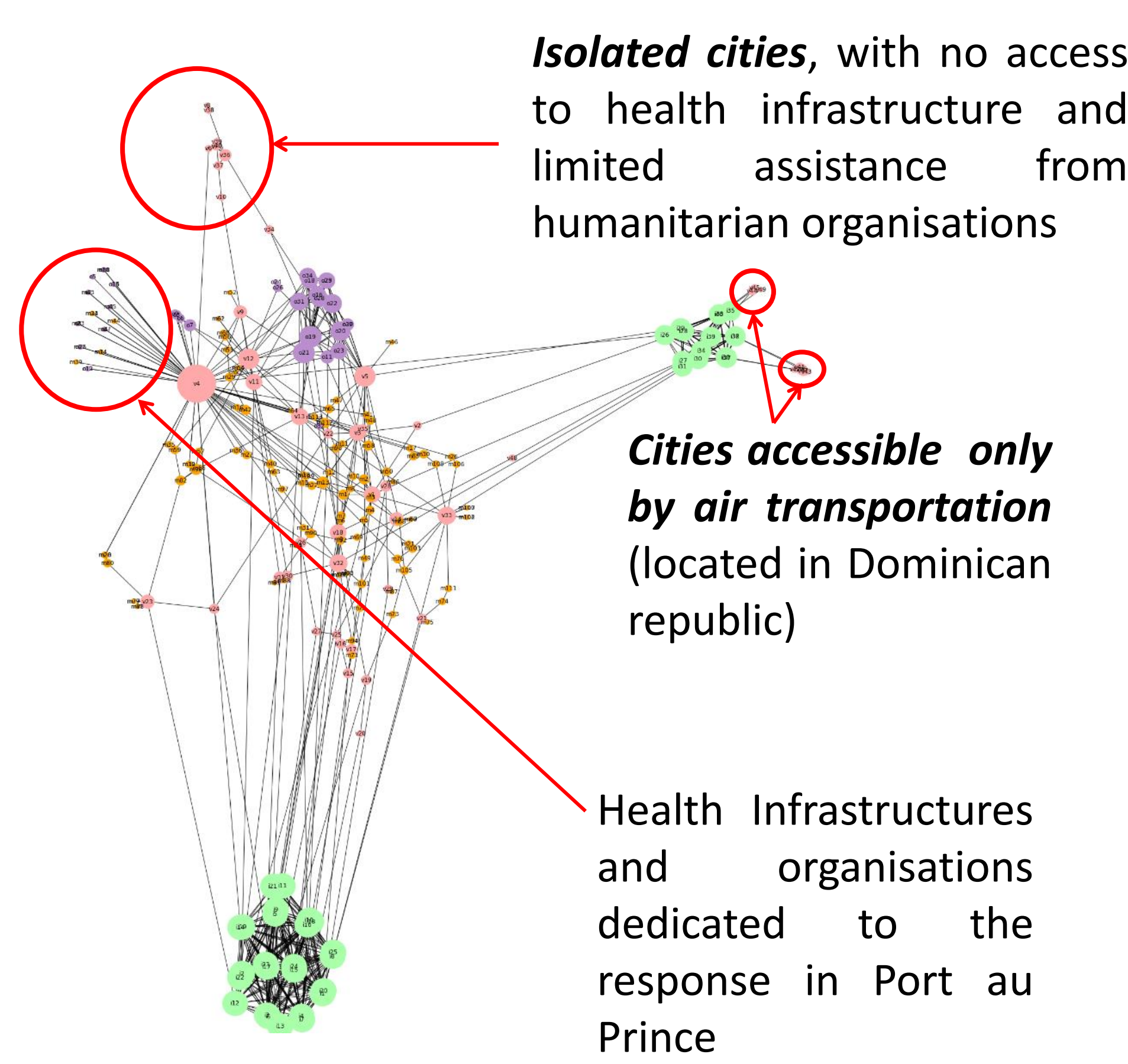


Haïti earthquake 2010



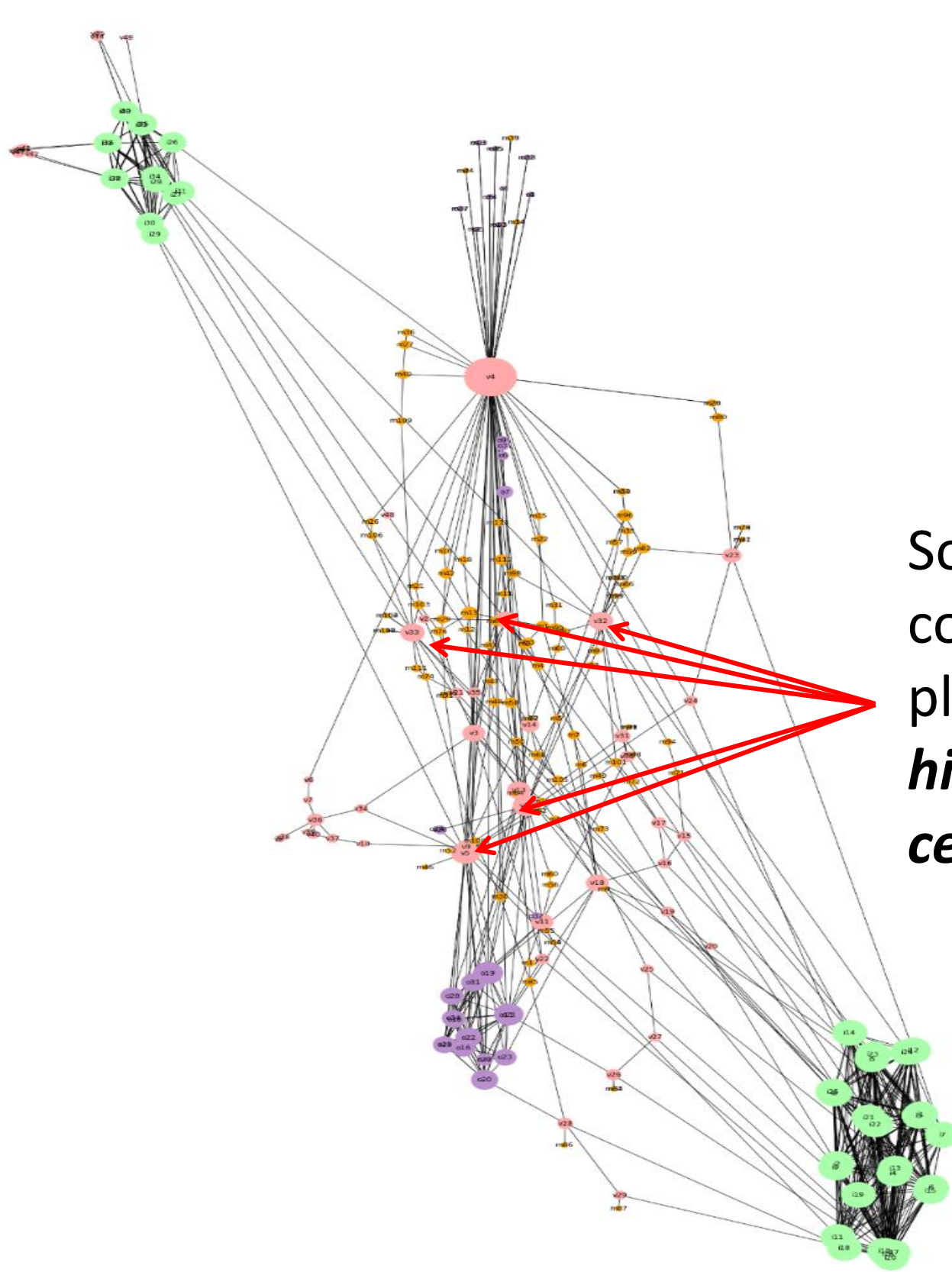
N = 240 and K = 845

CENTRALITY



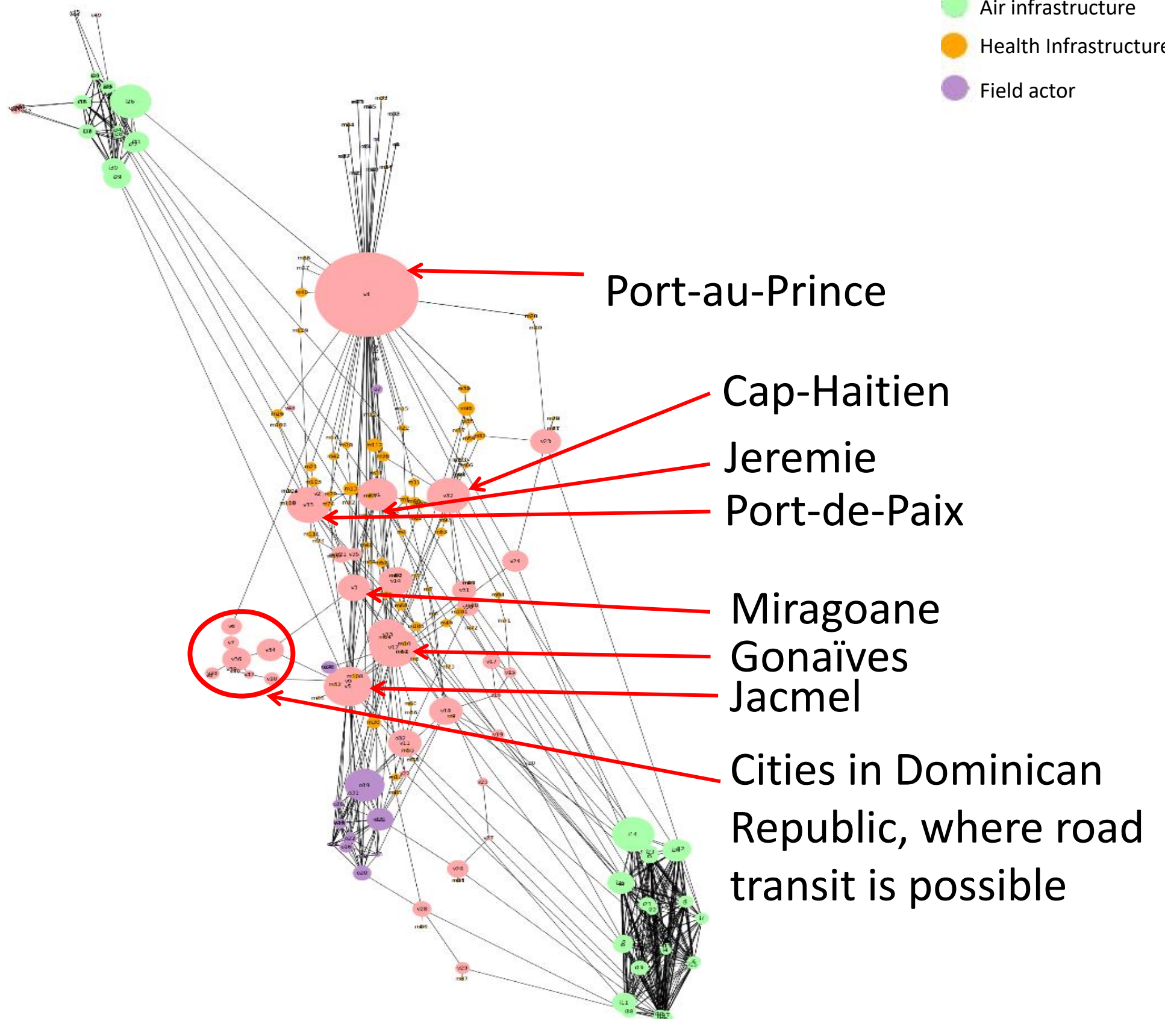
Degree

Layout Force Atlas : Degree



Degree

Layout Force Atlas : Betweenness



Betweenness

Layout Force Atlas : Betweenness

APPLICATIONS

- ✓ Provide useful insights during operations, to better understand the situation, and simulate various response scenarios to choose the best way to use the resources available
- ✓ Can be used in the preparedness phase, to propose ways to improve the resilience of the actual network