

Risk-KAN Working Group: *Cities & Critical Infrastructure*

Working Group Leads

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Rationale

Climate extremes, as well as natural and man-made hazards, often affect people directly, but sometimes exacerbate their impact by affecting urban environments and essential infrastructure services, including water, food, health, energy, information, security, and cultural identity. Cities are melting pots of cultures and innovations, but also hotspots of disaster exposure and impact chains that connect cities to other urban and rural areas. Infrastructures of multiple types distribute the cascading impact chains via lifelines, hubs, supply chains or rivers and ecosystems over urban areas and beyond. It is a special interest of this working group to analyse the interconnectedness of people, impacts and resiliencies through the lenses of infrastructure as well as culture and multiple dimensions of what makes it “urban”. People, their networks, and livelihoods are at the core of development and transformation driving cities, yet at the same time, they are at stake due to various drivers, conditions, and fluctuations, especially exemplified in cases of disasters. However, also investigating the interlinkages between urban and rural areas, as well as cross-sectoral and cross-border regions, is at the core of a holistic view. Infrastructure, whether blue, grey, green, or critical, is just one angle that permits pathways of interrelations, cascading effects, and impact chains we are interested in analysing.

Critical infrastructure, such as networks or distribution hubs, can provide relief, aid in preparedness, and facilitate recovery; however, when impaired, it can drastically diminish such efforts as well. Critical infrastructure, however, is more than just technical or structural – it also consists of humans either as users, providers and regulators of the services, goods and processes of infrastructure systems, whose priorities and understanding of appropriate ways to supply infrastructure are intertwined with expectations and practices of use, both of which are equally significant. When users do not trust failing governance systems or technologies, it adds to the failure of an infrastructure service. Concerning climate and global change, growing local as well as global interconnectivity also means increasing interdependencies among infrastructure networks, services, and users. Cascading effects of extreme events can lead to systemic failures. For example, the failure of a power station due to a flood can create an additional, compounding situation, exacerbating the flood itself through power failure, thereby directly affecting many people and indirectly impacting many more through the failure of backup systems in other infrastructure sectors. As the vulnerability paradox states, the more developed a society is, the more vulnerable it becomes to unexpected failures of its infrastructure. However, this must be analysed further for both developing and developed country contexts.

The topics of vulnerability research, as well as critical infrastructure, have driven the development of methodologies to identify and prioritise needs and capacities in dealing with risks, disasters, or transformations, including climate change-driven processes of adaptation and resilience. Deliberations about

prioritisation also prompt scrutiny, elicitation, and integration of the goals and values of different stakeholders, ranging from safety from harm to regulatory, economic, and environmental goals.

Integration

Cities and critical infrastructure offer a wide range of options for better integrating different fields across all aspects of sustainability, climate, disaster risk, and many other areas due to their cross-cutting character. The conception also supports the integration of existing interdisciplinary frameworks and conceptual approaches on socio-technical resilience, socio-technical systems, and modelling approaches, such as resource network analysis.

Transdisciplinary and applied commitment

The WG will establish a network by organising workshops on specific themes to foster conversations between different disciplinary communities, hosting seminars, drafting research and programmatic papers, and follow-up proposals, as well as developing web content and other dissemination materials. WG members can seek Risk-KAN endorsement for activities such as themed sessions at major conferences or workshops.