

climate change risk:

risk governance infrastructure

Following the liberalisation of markets, critical infrastructural systems have developed new kinds of risk and vulnerabilities. Climate change risk represents one of the main threats to critical infrastructures. Whether or not the country signs up to Kyoto they must still manage the risk. New models for the governance of risk should address the particular infrastructure criticalities, public benefit and relevance for economic development. Maurizio Sajeva sets out a model.

NOWADAYS, CRITICAL INFRASTRUCTURAL systems are complex systems-of-systems. With deregulation, reliability functions and responsibilities once belonging to a single actor have been shared among a multiplicity of participants, shifting from cooperation to competition, and sometimes involving the violation of the reliability rules.

In addition, infrastructural systems often cross national borders, and no single country or other actor can properly manage them alone. Their high degree of interconnectivity increases the risk of system inadequacies. A single failure can produce cascading effects in intricate chains, difficult to anticipate and disturbing the whole system. The uncertainty of risk and of risk propagation is greater than in single systems.

As a result, the complexity of infrastructural systems and the uncertainty of all possible effects have greatly increased. The interconnections and couplings result in nonlinear behaviours of cause-effect relationships. In contraposition to merely complicated systems, complexity refers to a holistic, emergent and chaotic context.

An immediate vision of infrastructural system criticality refers to the direct impact of upcoming infrastructures' failures or disruptions on the sphere of single stakeholders, formally in charge of guaranteeing security. Nevertheless, for its inherent characteristics of affecting the well-being and economic development of the whole society, the system itself represents a public good. In spite of critical

networked infrastructures being in private hands, their nature of public good cannot be underestimated, also in view of corporate social responsibility (CSR), which involves aspects of corporate reputation, governance and ethics. Private organisations are encouraged to consider the interests of society by taking responsibility for the impact their activities have on customers, employees, shareholders, communities and the environment. This obligation extends their statutory obligations beyond legislation in order to take, voluntarily, further steps to improve quality of life, well-being and economic development. The private interest of sector operators should therefore be balanced with the needs of the public.

The above arguments can be supported by development economics, which takes into consideration the qualitative changes that are produced when living standards are raised. The winner of the Bank of Sweden Prize in Economic Science, Amartya Kumar Sen, laid down the foundations of this economic thinking (Sen 2003).

Indeed, Sen's capability approach has greatly contributed to a shift from a vision of mere economic growth to one of human well-being. Growth and wealth are not goals to achieve but rather a means of achieving development. The purpose of development is to increase those human freedoms and choices that allow people to live full and creative lives and to increase their own capabilities (Sen 1999).

As Sen put it, "Public services can make people more capable of helping themselves and others" (Sen 1997: 5). The key point here is to support alternative conceptions of economic development (Thirlwall 2002). A positive relationship exists between public policies of expenditure and intervention in those sectors that are essential for guaranteeing economic development, investments, and therefore productivity growth. An increase of consumption may be a source of investment growth. Public policies aimed at achieving greater levels of public confidence, good-quality and secure social systems and infrastructures, a positive business environment, a knowledgeable and skilled labour force, and economic