New set of global principles for resilient infrastructure will reduce disaster risks

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The Institution of Civil Engineers (ICE) has been proactively involved as experts in the validation and spearheading of principles for resilient infrastructure. Following global consultations with member states in Qatar and the pre-launch at the UNDRR Global Platform in Bali in May, the United Nations office for Disaster Risk Reduction (UNDRR) published the six principles and 33 key actions.

The principles have been designed to directly support the Sendai Framework for Disaster Risk Reduction 2015-2030, in particular global target D, and goal 9 of the Sustainable Development Goals. The principles are the goals that an inter-dependent national infrastructure system must meet to be resilient, and to improve net resilience gain. There is plenty of evidence to suggest that national infrastructure will be challenged (and is already!) to keep: the lights on, clean water flowing, transport modes running, telecommunications channels open, and waste water processed. Resilience needs to be implemented into every action taken on national infrastructure systems: the commitment to net resilience gain will ensure this happens by increasing our stock of resilience and being prepared for the future.

The 33 key actions establish 'what' needs to happen across all infrastructure sectors for national infrastructure to be resilient. An example of a key action is P3.4 Maintain the natural environment. This is one of the key actions for principle 3: P3 Environmentally Integrated. P3.4 requires that trees and other components of the natural environment do not create vulnerabilities for infrastructure system, by avoiding debris, cracks, etc. Maintaining the natural environment will also deliver increasingly needed net environmental gains.

A Handbook for the principles to set 'how' to implement the key actions is underdevelopment and is being refined by experts including ICE. The Handbook describes the interventions needed by major stakeholder groups and the key performance indicators (KPIs) to assess progress on stakeholder interventions.

Stakeholders will need to implement the key actions according to their own constraints and settings, so the Handbook will offer a variety of methods to implement stakeholder interventions. Nations have various levels of sophistication for measuring sectoral (e.g. transport) resilience but this is almost exclusively post-hoc disasters. A key thrust of the principles is to be pro-active across all infrastructure sectors.

The KPIs can be assessed qualitatively for example through expert opinion or quantitatively using a mix of already collected data and new data. For example, a KPI "Complexity of repair" will help to assess whether key action *P6.1 Choose manageable solutions* has been implemented. Onsite repairs and use of technologies in which staff are skilled will reduce complexity, aid rapid recovery as well as prevent failures. All KPIs need to consider all infrastructure systems however depending on the national situation the assessment may be limited to those where data is available.

Prioritisation will be a key factor for stakeholders involved in the governance of national infrastructure resilience. Stakeholder interventions may increase resilience by different amounts depending on the current condition and status of national infrastructure. It is best to focus on where investment will reduce disruptions most. But governance processes will also need to prioritise based on assessing the frequency and severity of future hazards. Doing the right things now will mitigate future risks. Pro-active action is key.

Performance levels are suggested in the Handbook for each KPI however nations will need to set out their current ambitions in light of future risk assessment. This provides a simple way to prioritise interventions.

The Handbook is expected later in 2022 after deeper consultation with stakeholder groups. But meanwhile it is worth saying that interventions are of two general types: (i) enabling, and (ii) delivering. Enabling interventions are actions that need to be in place to allow delivery of national resilience of infrastructure. These include changes to regulations, standards, reporting, processes, etc. Delivering interventions are those which are implemented into practice and actually make a difference to the stock of resilience. It is this second type of intervention that is critical to achieve net resilience gain however it is dependent on the first type.

UNDRR is also now working with countries in implementing the Principles for Resilient Infrastructure.

References

UNDRR (2022) *Principles for Resilient Infrastructure*. Available at: https://www.undrr.org/publication/principles-resilient-infrastructure (Accessed: 6 June 2022).