

Event details

Title	Measures for Strengthening Resilience of Infrastructure Systems
Date	9 December 2020
Speakers	<ul style="list-style-type: none">▪ John Dora, <i>Director, Climate Sense Global</i>▪ Robert Wilby, <i>Loughborough University, United Kingdom</i>▪ Bregje van Wesenbeeck, <i>Advisor, Deltares</i>▪ Carlyne Yu, <i>Team Leader/ Project Director, Regional Integrated Multi-Hazard Early Warning System (RIMES)</i>
Moderator	<ul style="list-style-type: none">▪ Belinda Hewitt, <i>Asian Development Bank</i>



Source: ADB (Kiribati)

Overview **Exploring a 'toolbox of measures' for resilient infrastructure**

The third session of the Virtual Dialogues on Resilient Infrastructure explored a diverse range of **measures to strengthen the resilience of infrastructure systems** in Asia and the Pacific, drawing on global lessons learned and recent innovation. The session featured presentations and discussion on infrastructure resilience standards, including incorporating climate adjustment factors in road design standards, ; nature-based solutions (NbS) for infrastructure resilience, and early warning systems (EWS) for managing residual risk of infrastructure systems, following

which participants joined break-out groups to discuss opportunities to scale-up these measures in ADB Developing Member Countries (DMCs).

In relation to the enabling environment for resilient infrastructure, **infrastructure resilience standards** were highlighted as a key solution to drive enhanced infrastructure governance and scale-up resilience investment. Work is underway in a number of ADB member countries to update infrastructure standards to accommodate climate change, including the structural Eurocodes. DMCs have the opportunity to leverage lessons learned from this work in order to adapt existing codes and standards to accommodate a future climate. Such initiatives will require a robust and clear understanding of local social, institutional, and climate and disaster risk context, strong leadership and governance.

The session also explored **climate proofing of road design** based on experience from Viet Nam, highlighting opportunities to identify a wide range or 'toolbox' of adaptation measures within any given local context, informed by a robust understanding of local risk. Adaptive design and management present opportunities to shift beyond existing design standards to accommodate future climate risk and uncertainty. Adequate data and information, feedback mechanisms, and accountability are also key to enhance resilience through design, operation, and maintenance.

Discussion on **nature-based solutions** (NbS) explored how solutions across continuum ranging from (i) conventional infrastructure with NbS as an insurance or "over-design", to (ii) hybrid/blended, where NbS complements conventional infrastructure, and finally (iii) full NbS. A number of priority needs were identified to scale-up solutions in DMCs, including quantitative design standards for NbS, the inclusion of co-benefits in standard cost-benefit assessments, and involvement of stakeholders from earliest stages to ensure inclusive and culturally acceptable interventions. At an institutional level, cross-sectoral collaboration will facilitate NbS uptake and implementation. Scaling up NbS requires keeping an open mind at project inception stage, adopting a network and system approach, and considering opportunities to implement NbS across all project phases.

Early warning systems (EWS) have seen significant improvement in recent years. The session shared recent advancements in hazard-based forecasting, impact-based forecasting, and risk-based warning to inform critical infrastructure planning, operation, maintenance and emergency response, including examples of reservoir water level management in Thailand, EWS for coastal infrastructure in Europe, monitoring of transport network conditions in the US, and use of EWS to inform prioritization of flood mitigation initiatives in Tamil Nadu, India. In relation to operation and maintenance, the session highlighted the importance of shifting towards impact or risk-based forecasting, utilizing all available data across multiple

Key Takeaways

timescales, utilizing emerging technologies, and setting thresholds and triggers to effectively manage infrastructure.

1. **A strong understanding of local context** underpins resilient infrastructure measures – whether developing resilience standards, climate-proofing roads, or evaluating and designing effective and appropriate NbS.
2. **Risk-informed processes** are critical to prioritize resilience investment and decision-making.
3. **Shifting mindsets** is required to move from a ‘business as usual’ approach to delivering resilient infrastructure.
4. **Systems thinking** can help to ensure infrastructure is fully resilient to a wide range of shocks, stresses and future scenarios. This should take place as far upstream as possible and requires strong leadership and governance.
5. **Integrated approaches** are required to implement infrastructure resilience – including integration of ‘grey’, ‘blue’ and ‘green’ infrastructure, integration across sectors, and integrating early warning system information with infrastructure.
6. **The economic costs and benefits** of climate and disaster resilience measures must be quantified to support broader uptake. This includes accounting for co-benefits and potentially assessing benefits over longer timescales.
7. **Standards, guidance, tools and capacity building** are key to support DMCs to implement and sustain resilience measures – including on how to evaluate and respond to risk information, and how to evaluate and design robust and cost-effective resilience solutions.
8. **There is ‘no one solution’ for enhancing infrastructure resilience**, the most effective approach is to explore a ‘toolbox of measures’ within any given context.