

## **Compliance audit about specifications to ensure the resilience of the public infrastructure reconstructed by the National Commission for Risk Prevention and Emergency Attention (DFOE-AE-IF-00015-2018)**

### **What did we audit?**

The purpose of the audit was to examine the adequacy and relevance of the actions taken by the National Commission for Risk Prevention and Emergency Attention (CNE by its acronym in Spanish) to ensure the use of technical criteria to strengthen the resilience of public infrastructure exposed to extreme hydrometeorological events. In order to do that, the regulatory framework and risk management practices applied to reconstruction projects were analyzed, as well as the infrastructure delivered by the executing units. The analysis period was 2015-2018.

### **Why is it important?**

Between 2015 and the first half of 2018, CNE awarded public infrastructure reconstruction projects for an approximate value of CRC 59.034,5 million, due to emergencies caused by extreme hydrometeorological events. This shows the importance of incorporating resilience criteria in the life cycle of public infrastructure, in order to adapt it to climate change, ensure the continuity of the service it provides and reduce vulnerability.

### **What do we find?**

The regulatory framework is insufficient and lacks technical resilience criteria in order to use in public infrastructure construction, operation, and maintenance phases affected by extreme hydrometeorological events. For instance, Canada implements good practices, using the Protocol for Vulnerability Assessment in Engineering, which incorporates climate change risks analysis in the design, construction, and maintenance of public infrastructure. Other good references used were the World Bank and the UK Climate Impacts Program.

These regulations are the responsibility of the CNE, in accordance with Article 14 of Law No. 8488, as well as Article 2 of Law No. 4786. Also, according to Articles 2, 4, 10, and 11 of the Executive Decree No. 41187-MP-MIDEPLAN, which establishes strategic areas of coordination with the Land Management and Human Settlements Ministry; and the Environment, Energy and Seas Ministry, for the achievement of resilient urban and rural spaces.

In addition, the CNE did not manage prevention measures that would allow managing the risks of the reconstructed infrastructure, as a consequence of the extreme hydrometeorological events that affected several departments in Costa Rica: Mora, Turrialba, Pococí, Matina, Parrita, Coto Brus, Parrita, Coto Brus and Upala, from 2015 to 2018. The CNE did not apply actions at all in 8 out of 11 project milestones, and only partially in the other 3 remainings, as shown in the following figure.

**Figura n.º 1**  
**Medidas de gestión de riesgo no ejecutadas o parcialmente ejecutadas por la CNE en los hitos del proyecto de reconstrucción de obra pública**



This situation was critical in the slope stabilization project in Mora; where the rains and the weak control in the construction work caused new landslides that affected a neighboring house, the basic telephone services, the electrical wiring and the drinking water system. This tripled the original cost of the work from CRC 160.5 million to CRC 574.8 million.

In addition, in the reconstruction of the vehicular suspension bridge over the Zent River, Matina; a distance of approximately 15 meters was determined between the left bank and the base of the bridge; however, no measures were contemplated for the protection of the left foundation of the bridge in case of events during construction, which is why the distance between the foundation and the bank was reduced to 5 meters during the tropical wave No. 16, increasing the risk of scour. This warranted the substitution of the initial foundation proposal from shallow to deep, and an increase in the length between the bridge supports.

Finally, the CNE was untimely in the delivery of the maintenance forms of the reconstructed infrastructure to the local governments and institutions in charge of it, where some of them took up to 3 years to send them.

### What 's next?

SAI Costa Rica recommended to the CNE and to the Ministry of public infrastructure and transport, in coordination with the Ministry of Environment and Energy and the Ministry of Housing and Human Settlements, to design and implement regulations about principles, scope, and management tools in order to incorporate resilience measures in the life cycle of public infrastructure. In addition, recommendations to review and adjust the technical regulations applicable to reconstruction projects to ensure the implementation of risk management measures in the life cycle of the works.

The methodology utilized in this document was the audit procedure application, using for instance several interviews (including SAI Canada staff), literature review for good practices in order to complement the legal mandatory framework review, information requests and analysis, co-creation workshops with technical staff on the CNE, and other institutions, use of the world cafe methodology, and field inspections in several reconstruction projects to verify technical conditions in infrastructure.