How innovation is helping to deliver a new port for Nauru

The unique challenges of financing and building a climate-resilient port in a tiny Pacific country required ADB to develop and deploy innovative approaches to ensure the project’s design, governance, and monitoring were efficient and effective.

Nauru is the world’s smallest and most remote island nation, and its port is failing.

A lifeline for almost everything Naurans use and need, the 113-year-old port is technically not even a port, as it cannot accommodate seagoing vessels. Instead, ships moor offshore and their goods are unloaded at sea onto barges that ferry everything to a dock. The work is arduous and dangerous, and the entire process is dependent on good weather, meaning ships spend three weeks on average unloading in Nauru, seven-times longer than is standard elsewhere.

The costs of this system to Nauru are manifest—and multiplying. Goods are more expensive, workers risk injury, commercial opportunities are stymied, and the dock and moorings are easily damaged and regularly need costly repairs. Moreover, as climate change delivers more frequent and intense storms, ships will be forced to wait offshore even longer and the likelihood of increased or irreparable damage to the facilities increases.

A new port was needed, and on 29 January 2018 ADB’s Board of Directors approved a $21.3 million grant and agreed to lead construction. ADB’s contribution sits alongside $26.9 million from the Green Climate Fund, $14.1 million from the Government of Australia, and $7.5 million from the Government of Japan, with the Government of Nauru contributing $17.3 million.

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Yet the same factors that make the port a critical project for Nauru make it a uniquely challenging one for ADB. Being so small, local capacity to assess the project was limited. And being so remote, monitoring implementation and construction will be particularly difficult. Nauru simply does not have the institutional and human resource capacity and experience needed for effective, efficient, and high-quality project preparation and implementation.

Compounding these challenges were the technical difficulties of building a deepwater port in a challenging marine environment, and the high cost of doing so; with this much being spent, everyone involved needed additional reassurance that it was being spent wisely.

Addressing these challenges has led to the development of a project unlike any other in the experience of all involved, with four distinct and unique innovations applied.

**High-tech remote monitoring**

Reviewing progress on any major construction project can be complex, requiring time-consuming and potentially disruptive reporting from project managers to financiers and other partners.

To deliver simple, real-time updates with minimal interruption to the project, ADB is partnering with Australia’s CSIRO Data61 to develop a drone-based platform to remotely monitor the project and create a regularly updated 3D image of the site. A drone flown over the site once a fortnight will capture images that will be fed into the 3D model, which can then be used to track deliverables and outcomes, identify gaps and potential risks, and assess if additional equipment, machines, labor, or other resources are needed to keep work schedules on track.

Referred to as ‘digital twin’ technology, the platform being developed for this project has potential for widespread application to strengthen remote monitoring of construction projects, improve information sharing, and reduce project management costs. These benefits will increase as continual development of the ‘internet of things’ makes this technology more affordable and its capabilities more useful.

**Independent design review**

Design engineers were engaged to design the new port, but the Government of Nauru did not have the technical expertise to assess and decide on their proposed designs. In response, ADB hired an independent specialist firm to conduct a high-level review of the functionality, stability, and cost-effectiveness of the design recommended by the engineering team.

This independent review ensured the most cost-effective design option was selected, that it met international maritime design standards, and that it was the choice most appropriate to meet Nauru’s needs given expected long-term growth in the region. Along with advising the government, the reviewers also identified gaps in the designs and construction drawings that could lead to delays, which they worked with the design team to fix. Their review also enhanced the credibility of, and support for, the project among stakeholders, including co-finance.
External probity support

To address risks caused by limited local knowledge of governance issues, ADB engaged probity experts to fully audit the project’s procurement activities, from the invitation for bids through to contract signing.

Auditing established that those involved in the bid evaluation process had no conflicts of interest, and the civil works bidding process was conducted in adherence with ADB processes and international best practice.

Transparency and integrity were maintained by the experts’ participation in each step of the evaluation process until the contract was awarded.

Engaging these services assured all parties involved in the project, particularly development partners and co-financiers, that ADB’s robust systems were in place and being followed.

Independent technical audit

Extensive expertise across a number of disciplines needed to be corralled and applied to ensure the port is built without issues or avoidable delays, and at the required high standard.

Generally, this process is facilitated through supervision consultants, who aid and review the work of lead contractors. Given the complexity of this project, however, ADB suggested additional independent technical auditors be engaged to audit the performance of both the contractor and the supervision consultant.

Technical auditors who were experts in all of the appropriate disciplines were hired. Their periodic audits of the project identified a number of issues and gaps related to physical construction and safeguards, which the contractor and supervision consultant rectified before they could pose a greater risk. These audits prevented and mitigated real and potential risks, improving output delivery and the quality of the outcomes the project is expected to deliver.

These four innovative responses to knowledge problems are all first-of-their-kind solutions for ADB. The cost of implementing them was negligible, yet the value they have added in terms of effectiveness, efficiency, and quality of outcomes have been—and will be—enormous. Moreover, the assurance that the best and safest course is being taken has been greatly appreciated by the government, development partners, and other stakeholders.

Perhaps most importantly, the improvements introduced on this project are being shared, with ADB’s Pacific Department now looking to apply them to other projects across the region.

By Pivi Indrawansa, Senior Project Officer (Infrastructure), ADB Pacific Liaison and Coordination Office in Sydney

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