



Indonesia's Meninting Dam Project Supports Water Access in Promising Tourism Destination

PT Hutama Karya (Persero) Uses Digital Monitoring Software to Promote Safety and Sustainability in Key National Infrastructure Project

Within the archipelagic nation of Indonesia, the island with the greatest international tourism profile is the lush and paradisaical Bali. But just to its east in the chain of the Lesser Sunda Islands, the island of Lombok is also growing a reputation as a tourist attraction.

Lombok is known for its hiking opportunities, including trails along Mount Rinjani, Indonesia's second-highest volcano. Additionally, Mandalika, a resort area on the island's southern coast, was named in 2020 as one of Indonesia's five "super-priority destinations"—sites that the Indonesian Tourism and Creative Economy Ministry is working to promote as international tourism hubs. Recently, Mandalika has attracted high-profile events, including the 2022 Indonesian motorcycle Grand Prix, which served as the second round in the international Moto Grand Prix Championship.

However, while the tourism possibilities in Lombok offer a promising avenue for Indonesia's economic development, island locals are facing a serious daily threat to their way of life, one that is also holding back the area's tourism potential. During the 21st century, Lombok and the larger Indonesian province of West Nusa Tenggara have experienced growing water scarcity during dry seasons, with limited water available for drinking and sanitation. This scarcity also encroaches on Lombok's vital agriculture practices; the island is one of the top rice producers in Indonesia, and farming is the most common profession among locals.

To provide balance in water availability between Lombok's rainy and dry seasons, Indonesia's Directorate of General Water Resources tapped PT Hutama Karya (Persero), a state-owned enterprise that executes infrastructure projects, to engineer a dam in the West Lombok Regency. This district stretches along most of the southwestern coast of Lombok. The Indonesian government has honed in on the Meninting Dam as a linchpin for the development of the country's infrastructure and economy, officially naming it a National Strategic Project for the Acceleration of Economic Growth in Indonesia.

"It will significantly support the agricultural sector of the locals, and also support economic growth by making a new destination for the tourism sector," said Christy Vania, an engineer at PT Hutama Karya who is focused on building information modeling.

Safety Measures

Work on the USD 95.15 million Meninting Dam began in 2019 and should last into 2023. When completed, the dam will be 79 meters high with a water capacity of 12 million cubic meters. It will irrigate more than 1,500 hectares of agricultural property and ensure the availability of clean water to nearby Lombok residents and tourists. Additionally, the dam will provide an additional 0.8 megawatts of clean, hydroelectric power to the community.

However, to achieve this vision, PT Hutama Karya's engineers had to navigate tricky terrain. Parts of the site chosen for the dam were difficult to access, with thick trees and shrubbery and steep conditions. The undeveloped site presented an unknown degree of hazards for surveyors and construction workers. When the team attempted to survey the property using traditional methods, the data collection process was drawn-out and dangerous.

Considering these challenges, PT Hutama Karya decided to revolutionize their surveying and data collection by fully digitizing their processes. The team used a drone with a flying distance of 7 to 8 kilometers to capture images and data from the site's hardest-to-reach areas. The drone's findings were then processed using Bentley's 3D reality modeling and real-time visualization software to chart maps and monitor ongoing conditions at the site, identifying any new potential work hazards over time. This methodology cut the time required for data collection and monitoring by half and contributed significantly to worker safety. In total, project engineers saved an estimated USD 2.1 million in fees by avoiding potential work-related accidents.

"Because the terrain is very steep, there is a high potential for landslides. But we can say we had around 1,200,000 safe resource hours without lost time or injury," Vania said.

For the construction phase of the project, these digital visualization tools were folded into PT Hutama Karya's GIS dashboard, which also integrated BIM capabilities. Post-construction, these tools will also be useful so that Indonesia's Directorate of General Water Resources can monitor the dam's performance and upkeep.

Vania believes that the safety and cost benefits evident from PT Hutama Karya's innovations on the Meninting Dam will undoubtedly be carried forward into the organization's future projects, and digital surveyance will become a best practice.

Sustainable Priorities

Another one of PT Hutama Karya's priorities for the Meninting Dam was to keep the project's development as sustainable as possible. For instance, during construction, the company took steps to reduce the impact of tree cutting. Where trees had to be removed in the dense forest area, steps were taken to use displaced soil in another area of the project. That soil was also used to plant new trees.

PT Hutama Karya's venture into digital project management also helped to keep sustainability front and center. In a region where clean water is already precious, it was important to ensure that construction activities did not result in further contamination of the Meninting watershed.

Through digital monitoring, project managers noticed that river water around the dam's construction was becoming dirty with excavated soil and heaps, creating a potential environmental risk for people who live within a 3-kilometer radius of the dam. Project managers were then able to reduce the pollution and avoid creating ill effects for the civilians they hoped to serve with this key infrastructure project.

Spotlight on Fariz Harwanto and Christy Vania

Engineers with PT Hutama Karaya (Persero) Oversee Key National Projects for Indonesia's Development

In 2016, Indonesia implemented a sweeping plan to progress national development through key infrastructure projects. The nation's government convened the new Committee for Acceleration of Priority Infrastructure Delivery, which identified around 245 urgent projects, including new roads, dams, airports, power plants, and irrigation networks.

These strategic projects will not be completed overnight. However, work has already advanced on several high-priority projects under the guardianship of engineers with the state-owned enterprise PT. Hutama Karaya (Persero). One of these engineers is Christy Vania, a self-described building information modeling enthusiast who works out of PT Hutama Karaya's Jakarta headquarters. Vania has been responsible for overseeing streamlined BIM implementation from the project level to the corporate level, including major efforts such as the Trans Sumatera Toll Road and the ongoing Meninting Dam project in West Lombok.

"We [implement] best practices for the projects we manage, but also, we keep looking for something new to develop in BIM technology," Vania said.

One of the individual project managers who has worked together with Vania is Fariz Harwanto, the current site engineering manager for the Meninting Dam on the island of Lombok. This location is a point of passion for Harwanto, who cut his teeth as an engineer by assisting with the coordination of temporary shelters and schools for Lombok earthquake survivors in 2018. Now, he looks forward to seeing the completed Meninting Dam improve everyday life for people in the area.

"I'm very interested in how the dam will help the local community in farming, with water, and as a tourism area," Harwanto said.

The two engineers agree that it is a prime moment to be an engineer in Indonesia, as the country is gaining momentum to address so many key infrastructure issues. Harwanto is excited to welcome budding young engineers to the engineering field as it continues to grow to meet Indonesia's needs.

“I would tell them to prepare to learn,” he said. “[It takes] problem solving. How can we get to work when the land acquisition has not been completed? How do you make our method work with current conditions?”

With so many experts needed to move Indonesia’s strategic development forward, opportunities are opening for people who may have been shut out of the engineering field in the past, Vania said. In fact, she said that the field needs new voices more than ever as it strives to meet ambitious national goals.

“For women, the engineering field is very open today,” Vania said.



[Image Link](#)

Image Caption: PT Hutama Karya decided to revolutionize their surveying and data collection by fully digitizing their processes. *Image courtesy of PT Hutama Karya.*

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