



## The power of water

**T**HE RECENT FAILURE OF THE SITU GINTUNG LAKE DAM has once again focused attention on disasters in Indonesia, this time due to human neglect. As reported some time ago, Indonesia is one of the most disaster-prone countries in the world, with water-related incidents providing at least one-third of the total. In February 2005, I paid my first visit to Aceh after the traumatic tsunami disaster as a representative of the British Chamber of Commerce in Indonesia and my professional body, the Institution of Civil Engineers.

I was a witness to the aftermath of one of the world's worst natural disasters. The devastation seemed worse on the ground than might be seen on television. I was very moved! The success of the immediate recovery stage response was a tribute to the enormous effort of government and many world organizations, NGOs and ordinary people, and shows what the human spirit can achieve when it puts its mind, body and soul to helping fellow humankind in distress.

The following stage of reconstruction was always going to be beset by difficulties, not just by the sheer administrative challenge of the operation but also due to the enormous technical and social complexities involving many people deprived of home, livelihood and belief.

It was important to restart the engine of hope and endeavor and this took at least nine months. While there remain many matters unfinished and in some places rebuilding leaves something to be desired, the foundation has been laid. Sustaining the development will depend on local government and, above all, empowering the people in the various communities of the province.

### High energy forces

IT WAS SOBERING TO HEAR THE COMMENT OF A SURVIVOR OF the wash-out following the Situ Gintung failure that it was "like a tsunami," stressing again the high potential energy of a large wall of water: virtually irresistible. Many column inches have already been written on the whys and wherefores of this dam failure, and the "blame game" is well underway.

Many years ago I served as an expert on a city disaster, with many deaths, which included a significant geotechnical engineering content as part of the cause. Several government bodies were involved. However, I was intrigued at the outcome of the ensuing public inquiry, where the court pronounced a verdict that no one was to blame. The court then apportioned damages.

While there are obvious differences in the current situation with Situ Gintung, it is important to take steps to prevent such events happening again.

This will mean the establishment or serious activation of a special body of experts that can establish standards and regularly, or periodically as the need arises, the safety of all water-retaining structures in Indonesia, reporting to the highest levels of government, and not subject to government department pressure.

In many countries, there are dam safety committees, which carry such responsibilities and comprised of people with all the necessary expertise and who report routinely on their inspections. I have carried out such work for the UK Dam Safety committee, albeit a long time ago, and the responsibility has to be taken seriously, as I also found when reporting on the failure of an irrigation regulator earth dam controlling water from the Mekong in northeast Thailand.

In West Java alone there are some 10 major structures, which serve either an important hydro or irrigation water supply function. There are a whole lot of other smaller structures, over 190, some of which are old and even very old, and which are used for irrigation or local water supply needs.

These all need to be properly documented reflecting conditions today which, in a number of cases, will have changed from the time when initially commissioned.

After all, it was the uncontrolled developments in South Jakarta which played a significant part leading to the failure of the Situ Gintung structure. A considerable reduction in the effective plan area of the reservoir caused a raising of the water level and the increased chance of overtopping under extreme storm conditions.

Design inadequacy for overtopping of earth structures is always a potential recipe for disaster, the dam becoming overstressed under these conditions, and any lack of maintenance, either associated with the main or peripheral structures, will only add to the weakness of the structure.

A main difference between the Aceh tsunami and Situ Gintung is that the former was a natural event, for which warning systems have now been fitted, while the failure of the latter was entirely due to human neglect.

In both cases, however, people have died and families have been left distraught or destroyed. It is essential that there is quick response to ensure, as the president has indicated, that Situ Gintung is not repeated, and not just in West Java, but across the nation, especially since water demand is increasing steadily every year and more water retaining structures will be required. ■

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