

Myth or reality: Do dams protect us from floods? March 14, 2007



We are once again facing severe floods on the Zambezi Valley. Entire communities have lost their crops, their homes, and are enduring extremely difficult living conditions, despite the effort, work and dedication of our governmental agencies, such as INGC.



In the midst of this crisis, we were surprised by the statement made by our Energy Minister: "Mozambique plans to build dams to avoid repeats of the flooding of the Zambezi River that has devastated the country in recent weeks." Afolnews reported: "More dams, the government holds, could reduce damages in future. The first dam to be constructed will be the Mpanda Nkhuwa dam, located 70 kilometers downstream from the Cahora Bassa dam in the Tete Province, according to Energy Minister Salvador Namburete."

Is building more dams on the Zambezi River is the solution? Is there any scientific proof for such a statement? History does not support such a statement, and actually reveals dams to be a poor answer to the growing issue of floods for many reasons:

Structural controls such as dams and embankments can mitigate the impacts of 'normal' annual floods, but they can also worsen the severity of extreme floods. Coupled with this is the fact that severe floods could increase with climate change, which is thought to be increasing the variability, intensity, and frequency of rainstorms. Our existing dams have not been designed to account for major flow changes that climate change could bring. A reservoir with sufficient capacity can help alleviate floods downstream by storing some or all of the excess flow after heavy rains. But the Zambezi's very large dams are multipurpose projects, where financial and political pressures mean that frequently keeping the reservoirs high to maximize electricity generation and water supply. In most multipurpose projects, these two money-making functions take precedence over keeping the reservoir low to make room for floodwaters.

Globally, there are numerous cases where floods have been made worse because dam operators held back water while the reservoir was filling, and then, when the rains kept on coming, had to open their spillways under emergency conditions to prevent their dam from being overtopped.

Probably the main factor behind the spiraling costs of flood damages around the world, however, is that dams and embankments induce a false sense of security. Deliberately or not, people are encouraged to settle on the floodplains, making future floods much more serious than if no controls had been built and the plains had been left undeveloped. Furthermore, the progressive loss of storage capacity to sedimentation reduces the ability of dams to capture flood waters, with the result that year by year the risk to the new floodplain dwellers increases.

A related problem is that deforestation, degradation and urbanization of watersheds is increasing the speed at which water runs off the land and into rivers. ,

With these factors in mind, let's go back to the Zambezi Valley:

The Zambezi typically floods twice each rainy season – a cycle that was interrupted by the dams. Engineers try to keep high water levels behind dams, which translates into greater electricity production during the dry season. When the first flood hits the Zambezi (usually in December), the dams trap the flow to replenish dam levels. The dams are then too full to absorb the larger February flood.

The situation has the potential to become worse. Bryan Davies, a river ecologist and Zambezi expert at the University of Cape Town, in 2001 described the regulated flow of the Zambezi as "a climatic and ecological time bomb." Two large dams – Kariba in Zambia and Cahora Bassa in Mozambique – are locked in an alarming balancing act of river regulation, a system that too often teeters on the brink of catastrophe. At this point in our history, we can truly say that floods are under the control of humans, not just nature.

Historically, large floods regularly pulsed through the lower Zambezi, but the dams have so altered the hydrological regime as to change settlement patterns. The now infrequent and highly regulated flooding in the basin has created a false sense of security for the people living downstream. Before the dam's construction, they annually migrated onto the floodplain to farm and then moved back to safety before floods arrived. In more recent times, decreased flows forced communities to farm the flood zone. Formerly productive farmland is now marginal without the floods' regular deposits of silt. Thriving fisheries have disappeared. "People have moved into the floodplain to feed themselves," said Davies. These new settlement patterns mean that hundreds of thousands of people are literally in harm's way when the big floods inevitably spill over upstream dams.

The dams-as-flood-control approach is particularly risky in light of "super storms" expected to result from climate change. The existing dams are not designed (or operated) for a changing climate, and Mphanda Nkuwa, at the moment, is not designed in a way that it could solve this problem. It is expected to be a so-called "run of river" project, which means a small reservoir. Its main purpose will be electricity production, making it even more unlikely that it will serve any flood-mitigation purpose.

In the case of this year's floods, government claims to have started preparing for the flood last October. Yet, if this is so, why was the water level in Cahora Bassa so high in December? Why didn't they release water knowing that we were expecting a heavy rainy season?



There are still many unanswered questions about the management of Cahora Bassa this season and for the past 30 years. We believe it is time to have these questions publicly answered, using independent experts in hydrology, river ecology, and dam management. We request that a thorough investigation should be made in order to determine whether or not Cahora Bassa's management is contributing to the severity of these floods or is it protecting us from even worst damages, as we have been told time and time again. It is time to request the dam agency's records so that these questions can be answered once and for all.

To avoid further disasters, Cahora Bassa must be managed in a new way, one that respects the need for naturalistic flows of water. We need a comprehensive plan for restoring floodplains, releasing water more naturally from the dams, and instituting Integrated Water Resource Management for the Zambezi basin has to be put in place, before we consider building any more dams.