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Hydro dam boom threatens a third of the world's freshwater fish

Plans to build huge dams in the Amazon, Mekong and Congo could devastate freshwater biodiversity in these tropical river basins, say ecologists

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One third of the world's freshwater fish are at risk if dozens of large hydroelectric dams are built in the Amazon, Congo and Mekong basins, aquatic ecologists have warned.

Very few dams have so far been built in the basins of the world's three great tropical rivers because of their remoteness and vast catchment areas. But rising demand for clean electricity in burgeoning tropical cities, and new roads to areas once considered impossible to access, has led to plans for over 450 dams for the three mega-diverse river basins.

If the dams are built, tropical freshwater biodiversity, which is at its most diverse in the three river basins, could be devastated, say the authors.

"Large dams invariably reduce fish diversity and block movements that enable migratory species to complete their life cycles. This may be particularly devastating to tropical river fisheries where many species migrate hundreds of kilometres," said the team of 39 American, Brazilian and European authors in the journal Science.

They dismiss many of the arguments put forward by dam builders that better designed fish passages incorporated into major dams allow species to move freely up rivers.

"Dam proposals continue to tout fish passages as the principal means for minimising impacts on migratory species. They have proved unsuccessful and even harmful. Large dams delay and attenuate seasonal food pulses, reducing fish access to floodplain habitats that are an essential nursery area and feeding grounds," the paper said.

They also argued that governments and planners have failed to assess the true benefits and costs of large hydropower projects. "An estimated 75% of large dams suffer cost overuns. Economic projections frequentlyexclude or underestimate the costs of environmental mitigation, as in the the case of the $26bn (£18bn) spent by China to moderate the ecological

impacts of the Three Gorges dam."

In the Amazon basin, the authors said, 334 dams have been proposed which together could devastate fisheries and lead to deforestation.

"The impacts would extend far beyond the direct effects on rivers to include forced relocation of human populations, and expanding deforestation associated with new roads. The Belo Monte dam [being built on the Xingu River in the state of Pará, Brazil], would be the world's third largest but may set a record for biodiversity loss."

The Congo has far fewer proposed dams, but the Inga Falls, a 14km stretch of the river where it drops 96 metres near the coast, has greater hydropower potential than any other river on earth. "Planned dams at the Inga Falls could harness 83% of the river's annual discharge and could divert water and substantially reduce flow for miles downstream," the study said.

Six large dams have been built on the Upper Mekong river, mainly in China, since the mid 1990s, but there are now plans for 11 more on the main river and 88 on its tributaries in Thailand, Cambodia and Laos. These, said the paper, could affect food supplies across the region.

"Without more careful assessment and planning, negative ecological, social, and even monetary impacts will accompany construction of new hydropower in the world's tropical rivers," the authors concluded. "Species extinctions and basin-wide declines in fisheries and other ecosystem services are certain to accompany new hydropower in the world's mega diverse tropical rivers."

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