15 -ാം കേരള നിയമസഭ

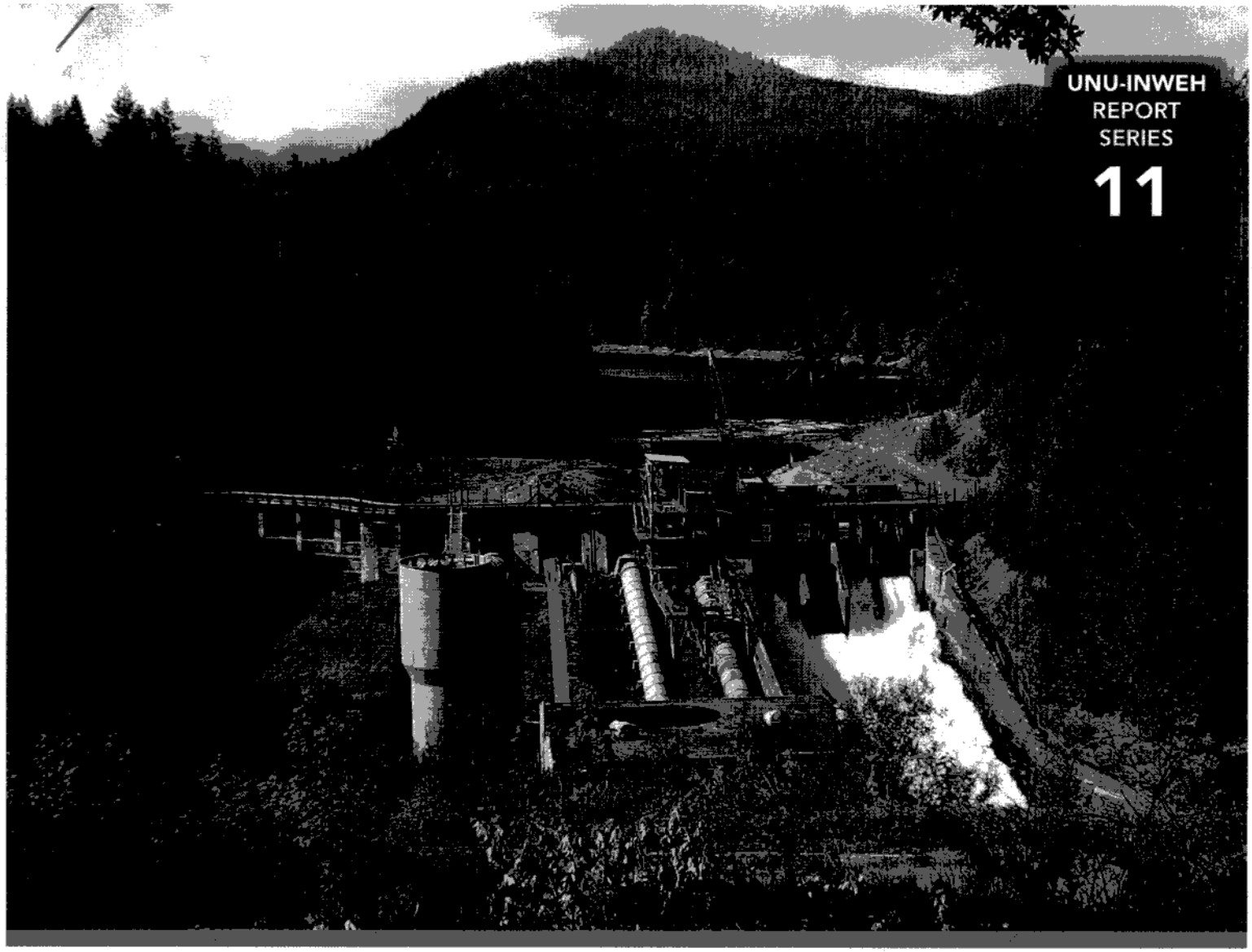
3 -ാം സമ്മേളനം

നക്ഷത്ര ചിഹ്നം ഇല്ലാത്ത ചോദ്യം നം. 6090 **09-11-2021 - ൽ മറുപടിയ്ക്ക്**

മുല്ലപ്പെരിയാർ ഡാമിന്റെ അപകടാവസ്ഥ സംബന്ധിച്ച പഠനം

ചോദ്യം		ഉത്തരം	
ശ്രീ. എൻ. ഷംസുദ്ദീൻ		**Shri Roshy Augustine** **(ജലവിഭവ വകുപ്പ് മന്ത്രി)**	
(എ)	മുല്ലപ്പെരിയാർ ഡാമിന്റെ അപകടാവസ്ഥ സംബന്ധിച്ച് യു.എൻ. സംഘടനയ്ക്ക് കീഴിലുള്ള ഏജൻസി ആയ യു.എൻ. യു. ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ വാട്ടർ,എൻവയോൺമെന്റ് ആന്റ് ഹെൽത്ത് എന്ന സ്ഥാപനം തയ്യാറാക്കിയ റിപ്പോർട്ട് ശ്രദ്ധയിൽപ്പെട്ടിട്ടുണ്ടോ; എങ്കിൽ ഇതിന്റെ വിശദാംശങ്ങൾ നൽകാമോ;	(എ)	ശ്രദ്ധയിൽപ്പെട്ടിട്ടുണ്ട്. യു.എൻ സംഘടനയ്ക്ക് കീഴിലുള്ള ഏജൻസിയായ യു.എൻ.യു. ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ വാട്ടർ, എൻവയോൺമെന്റ് ആന്റ് ഹെൽത്ത് എന്ന സ്ഥാപനം തയ്യാറാക്കിയ റിപ്പോർട്ടിലെ മുല്ലപ്പെരിയാർ ഡാമിനെ സംബന്ധിച്ച പ്രസക്ത ഭാഗങ്ങൾ അനുബന്ധമായി ചേർക്കുന്നു.
(ബി)	ലോകത്തെ അപകടവാസ്ഥയിൽ ഉള്ള ആറ് ഡാമുകളിൽ ഒന്നാണ് മുല്ലപ്പെരിയാർ എന്ന് റിപ്പോർട്ടിൽ സൂചിപ്പിച്ചിട്ടുണ്ട് എന്ന കാര്യം പരിശോധിച്ചിട്ടുണ്ടോ; പ്രസ്തുത വിഷയം സുപ്രീംകോടതിയുടെയും കേന്ദ്ര സർക്കാരിന്റെയും പരിഗണനയിൽ കൊണ്ടുവരാൻ നടപടി സ്വീകരിച്ചിട്ടുണ്ടോ; വിശദമാക്കാമോ?	(ബി)	ലോകത്തിലെ അപകടാവസ്ഥയിലുള്ള ആറ് ഡാമുകളിൽ ഒന്നാണ് മുല്ലപ്പെരിയാർ എന്ന് റിപ്പോർട്ടിൽ സൂചിപ്പിച്ചിട്ടുമുണ്ട്. ഡോ.ജോ ജോസഫ് ബഹു. സുപ്രീം കോടതിയിൽ ഫയൽ ചെയ്ത റിട്ട് ഹർജിയിന്മേൽ 27/10/2021-ന് ബഹു. കോടതി പുറപ്പെടുവിച്ച ഇടക്കാല ഉത്തരവിന്മേൽ standing counsel ന് സമർപ്പിച്ച റിപ്പോർട്ടിൽ കേരളം ഈ വിഷയം സൂചിപ്പിക്കുകയും ആയതു ബഹു. സുപ്രീം കോടതിയിൽ ഫയൽ ചെയ്യുകയും ചെയ്തിട്ടുണ്ട്.

സെക്ഷൻ ഓഫീസർ



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Ageing Water Storage Infrastructure: An Emerging Global Risk

Duminda Perera, Vladimir Smakhtin, Spencer Williams, Taylor North, Allen Curry

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Ageing Water Storage Infrastructure: An Emerging Global Risk

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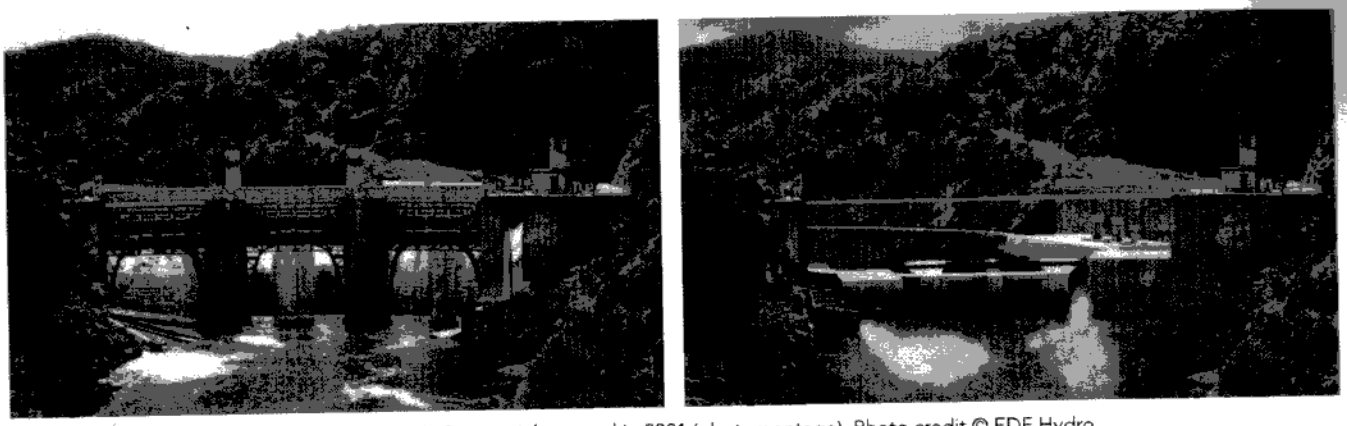

Figure 10. The Poutès dam before (2015) and after partial removal in 2021 (photomontage). Photo credit © EDF Hydro

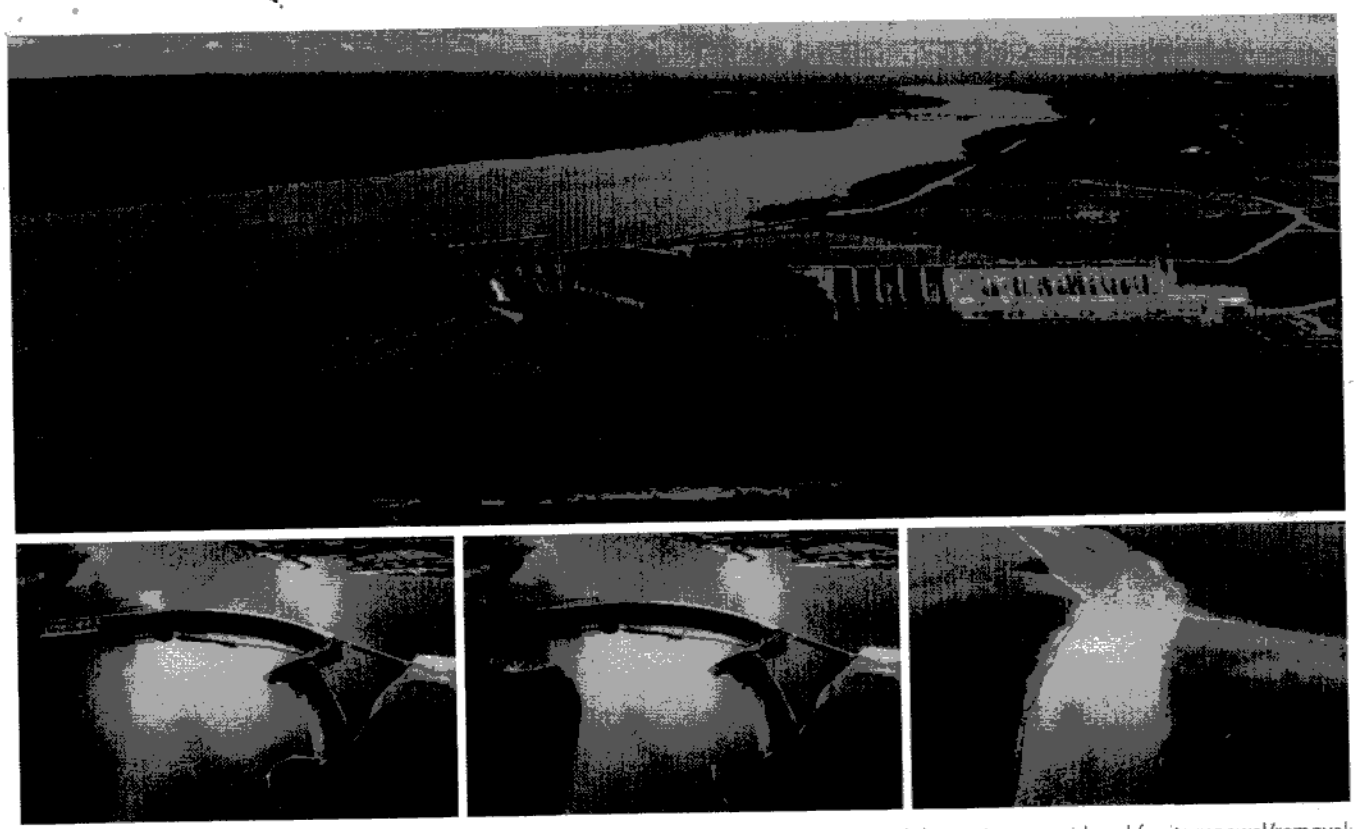

Figure 11: The Mactaquac Hydroelectric Generating Station Dam (actual current view- *top*) and the options considered for its renewal/removal: Repowering (construction of the new powerhouse and other components – *bottom left*); Maintaining the dam as a water control structure without power generation – *bottom middle*, and Removing the dam to ensure a free-flowing river - *bottom right* Credit and Source: New Brunswick Power 2013; https://www.nbpower.com/en/about-us/projects/mactaquac-project/resources/

Mullaperiyar Dam, Periyar River, Kerala, India. Age: 125 years

The Mullaperiyar Dam (Figure 12) is a gravity dam of 53.6 m in height and a reservoir capacity of 443 million m^3. It impounds the Periyaru River in Kerala State, downstream to Tamil Nadu state, India. It was built in 1895 by the British government to provide irrigation and eventually began to generate power in 1959 (Chowdhury, 2013; Thatheyus et al., 2013). At the time of construction, the dam had an intended lifespan of 50 years (Chowdhury, 2013). Still, in service over a century later, the dam shows significant structural flaws and may be at risk of failure. The dam is located in a seismically active area. A minor earthquake caused cracks in the dam in 1979 (Rao, 2018), and in 2011, more cracks appeared

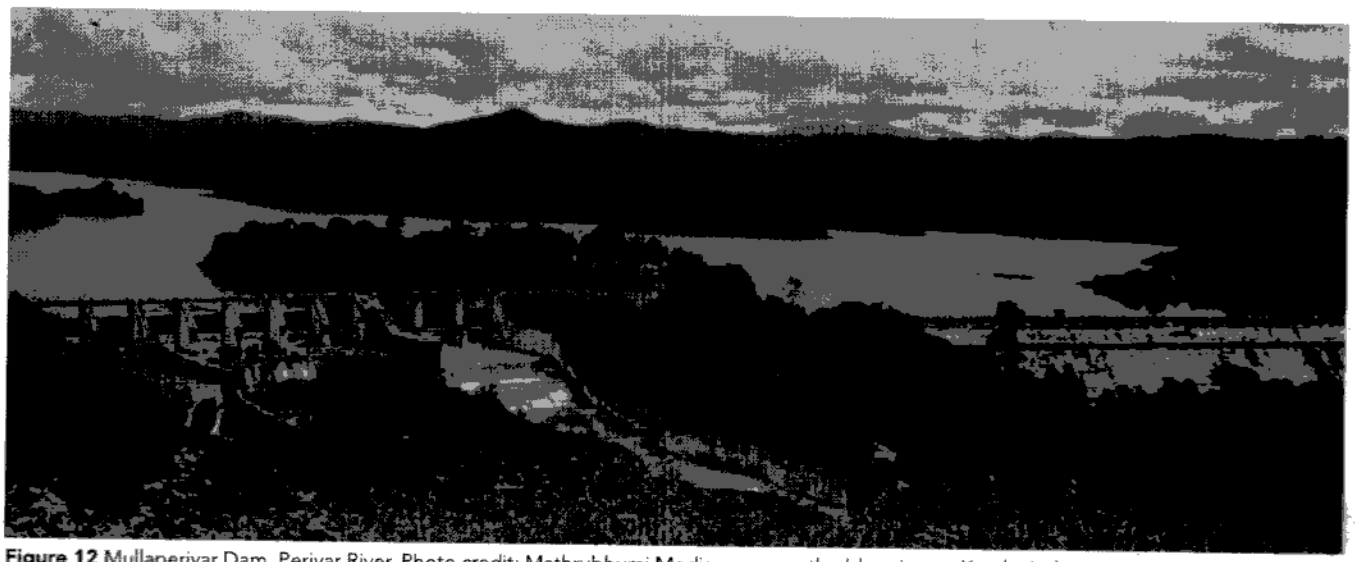

Figure 12 Mullaperiyar Dam, Periyar River. Photo credit: Mathrubhumi Media - www.mathrubhumi.com Kerala, India. Source: https://english.mathrubhumi.com/topics/Tag/Mullaperiyar%20Dam

in the dam due to seismic activity (Thatheyus et al., 2013). Leaks and leaching are also concerning, as the methods and materials used during construction are considered outdated compared to current building standards. In response to these structural issues, dam decommissioning has been considered. However, a conflict between Kerala and Tamil Nadu States started to grow regarding the best way to manage this ageing infrastructure (Thatheyus et al., 2013). Although the dam is located in Kerala, it is operated by the upstream state of Tamil Nadu. Kerala residents are afraid of a dam collapse and argue that the reservoir level must be lowered until the dam is fixed.

Meanwhile, Tamil Nadu residents want to maintain the water levels at capacity (Rao, 2018). In 2009, Kerala requested a new dam to be built, but Tamil Nadu opposed the idea. Currently, the decision of how to manage the ageing Mullaperiyar dam is hotly debated and working through the court system. A dam failure risk would be catastrophic: nearly 3.5 million people will be affected (Chowdhury, 2013).

Kariba Dam, Zambezi River, Zimbabwe, and Zambia. Age: 60 years.

The Kariba Dam (Figure 13) is a concrete arch dam 128 m in height that impounds the Zambezi River between Zimbabwe and Zambia. As of 2015, it was the largest man-made reservoir in the world, impounding 181 km^3 of water (World Bank, 2015). During the construction, about 15,000 individuals were relocated from the reservoir footprint (Scudder and Habarad, 1991). The dam was completed in 1960 to cover the electricity demand of the Zambezi river basin region (Bertoni et al., 2019). About 35% of the basin's hydroelectric capacity originates at the Kariba dam, making it an essential source of energy for the region (Bertoni et al., 2019). The total capacity of the Kariba hydropower station is 1830 MW (World Bank, 2015). In 2015, the South African Institute for Risk Management identified that the Kariba dam needed urgent repairs after the dam's floodgates eroded a plunge pool at the dam's base, very close to its foundation (Liu, 2017). Erosion can potentially weaken the dam's foundation and could lead to its collapse (Leslie, 2016).

Additionally, repairing the spillway was deemed necessary to maintain the dam's stability (World Bank, 2015). A failure of the Kariba dam would be catastrophic and would also cause the collapse of downstream Cahora Bassa dam (Leslie, 2016). This would impact over three million individuals, and the population's electricity needs would no longer be met (Leslie, 2016). In 2014, almost USD 300 million was loaned to repair the Kariba dam (Leslie, 2016). Repair is expected to be completed by 2023 (World Bank, 2015). Dams like Kariba will likely continue to operate much longer with recurring investments into repairs despite the advanced age of 60 years by now, as they may be simply too large, risky, and costly to remove.