Ending Wars Over Water: Evaluating the Extent to Which Artificial Intelligence Can Be Used to Predict and Prevent Transboundary Water Conflicts

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Abstract : Worldwide, more than 250 bodies of water are transboundary, meaning they cross the political boundaries of multiple countries. This creates a system of hydrological, economic, and social interdependence between communities reliant on these water sources. Transboundary water conflicts can occur as a result of this intense interdependence. Many factors contribute to the sparking of transboundary water conflicts, ranging from natural hydrological factors to hydro-political interactions. Previous attempts to predict transboundary water conflicts by analysing changes or trends in the contributing factors have typically failed because patterns in the data are hard to identify. However, there is potential for artificial intelligence and machine learning to fill this gap and identify future 'hotspots' up to a year in advance by identifying patterns in data where humans can't. This research determines the extent to which AI can be used to predict and prevent transboundary water conflicts. This is done via a critical literature review of previous case studies and datasets where AI was deployed to predict water conflict. This research not only delivered a more nuanced understanding of previously undervalued factors that contribute toward transboundary water conflicts (in particular, culture and disinformation) but also by detecting conflict early, governance bodies can engage in processes to de-escalate conflict by providing pre-emptive solutions. Looking forward, this gives rise to significant policy implications and water-sharing agreements, which may be able to prevent water conflicts from developing into wide-scale disasters. Additionally, AI can be used to gain a fuller picture of water-based conflicts in areas where security concerns mean it is not possible to have staff on the ground. Therefore, AI enhances not only the depth of our knowledge about transboundary water conflicts but also the breadth of our knowledge. With demand for water constantly growing, competition between countries over shared water will increasingly lead to water conflict. There has never been a more significant time for us to be able to accurately predict and take precautions to prevent global water conflicts.

Keywords : artificial intelligence, machine learning, transboundary water conflict, water management

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