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Flood forecasting in developing countries: Challenges and Sustainability

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Operational flood forecasting has come a long way in the last few decades, with advances in meteorological and hydrological modeling being integrated into the operational forecasting process using state of the art models and forecasting systems. While such advances have been found in several countries with a strong institutional basis, application in developing countries faces many challenges, despite the relevance of reducing damage to those most vulnerable.

This paper addresses the challenges of establishing effective forecasting services in the developing country context. The paper discusses the operational forecasting system established for the Nile and its tributaries in Sudan in the early 1990s, which after being fully functional for some three years provided only a partial service thereafter up to the current day. The causes of the decline of the service can be found in the challenges commonly faced in many developing countries. Maintaining a team of skilled hydrologists and forecasters to sustain the service proved to be a key challenge, which was compounded by the fact that although the models and systems used were the state-of-the-art of the day, these were essentially black box and inflexible to change. The service was recently upgraded to the current standard in operational forecasting. The approach chosen is, however, quite different from that taken in the early 1990s, with a strong focus on sustainable and flexible methods. The paper discusses the challenges faced, and how the use of established standards, broadly accepted public domain tools, and flexible and open systems contribute to sustainable operation of forecasting in the developing country setting.