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Systematic User Feedback to Co-develop a Flood Early Warning System in West Africa

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Introduction

The Horizon 2020 project FANFAR (www.fanfar.eu) aims to develop a Flood Early Warning Systems (FEWS) for West Africa. Prospective end-users of the FANFAR system include the hydrological services and emergency services of 17 countries in West Africa. Close involvement of end-users during the development phase can enhance effectiveness and usefulness of early warning systems (Reid, 2006). Therefore, FANFAR took a co-development approach between the consortium of developers and the end-users (Andersson, Ali, et al., 2020). Important vehicle for co-development are three workshops, organised over three years by the development consortium. Workshops were attended by one representative from hydrological services and one from emergency services from each country. The objectives of co-development included: tailoring to user- and context specific preferences and requirements, acquiring technical feedback on system components, enhancing user skills and capacity, building trust and ownership, enabling performance testing and enhancing system uptake.

Approach

Several strategies and interventions have been deployed to meet the objectives. Firstly, a Multi-Criteria Decision Analysis was conducted to establish the end-users' primary objectives and system configurations to best meet these (Lienert, Andersson, & Silva Pinto, 2020). Furthermore, including the execution of regular surveys to explore user experiences with the system and receive technical feedback. Two different pen-and-paper surveys were taken during the both the second and third workshop sessions: (1) a survey exploring long-term and detailed information on usage, performance, preferences, obstacles and experience of using FANFAR and (2) a survey eliciting detailed technical feedback on separate system components. A third, shorter survey was conducted online on a monthly basis during the rainy season (May-October 2020) focussing on day-to-day operational usage and performance. Here, we summarise some main insights from these three types of surveys.

Outcomes

The data on user experience with the FANFAR system gathered during these interventions enabled

the development team to improve the forecast system. For example, accuracy was identified as critical issue to improve. In response, the development team initiated several activities aimed at improving accuracy, including model calibration, catchment re-delineation, assimilation of local streamflow observations and EO data, and utilising alternative meteorological data (Andersson, Santos, et al., 2020).

There was an important discrepancy between the reported overwhelming intention to use FANFAR (82-93%) and the actual usage (28-46%). One reason could be related to the reported barrier posed by the initial state of the system, and the lack of accuracy mentioned above. Furthermore, priorities and resources might partly explain these numbers. However, these finding could be skewed by the changing composition of respondents between surveys, compromising their representativeness. Indeed, the user statistics of the online platform show a rise in visits. Finally, users seem to prioritise a functional system delivering daily predictions over a complex system with broad functionality.

Overall, our co-development has been a positive one. Participation has been strong and continuous, with an increasing number of organisations and their representatives partaking in workshops. In addition, participation outside the workshops (during the rainy season) was encouraging, particularly in the light of its voluntary nature.

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