

Short Project Summary

User-oriented application of developed methods and tools

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Tractebel Engineering GmbH (Tractebel) is a worldwide operating engineering company that provides services for project-related development stages, in fields such as hydropower, irrigation and food security. It is due to this ability that Tractebel has a deep understanding on how information shall be provided to ensure a practical utilization of seasonal forecasted data.

Tractebel's main goal within this project is the assessment of the scientific results for the purpose of practical application. This process takes place in close cooperation with local decision makers to combine user-oriented and scientific information with the goal of contributing to specific decision support in these regions.

The tool collating these results is an online prototype that facilitates access and use of the outcomes of the project in form of methods and data including a seasonal forecast for water resources management. Tractebel assists in the development of this tool to ensure its practical utilization.

Methods and Data

Tractebel participated in stakeholder workshops for assessing user-oriented needs indicating necessary features of the online tool. Hydro-meteorological and sedimentological data of the study region Upper Atbara (Sudan) were collected, processed and provided to the project team for calibration of hydrological models. In order to assess benefits of a seasonal forecast for an existing reservoir, a spreadsheet model was developed for Upper Atbara Dam that considers reservoir operating rules for the maximization of electrical energy production.

Results and Conclusions

The functionality of the online tool has been tested during various development stages and options for improvement were discussed within the team.

The significance of the practice-oriented methodology was examined applying the example of the Upper Atbara Dam. For a typical dry year (2015), the reservoir operation was carried out first as for an average year and then for a dry year assuming the information of a seasonal forecast would be available. Results indicate that a reservoir operation adapted to the seasonal forecast can generate additional electricity worth about 1.3 million US\$/year. On the other hand, an incorrect seasonal forecast (forecast of a dry year, but an average year occurs) may lead to losses of about 0.3 million US\$/year.

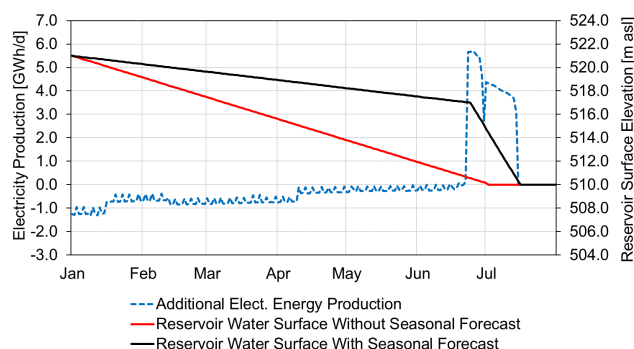


Figure 1: Benefits of a seasonal forecast for Upper Atbara

Similar to the benefits for electrical energy production, seasonal forecast is also able to improve the water resources management for irrigation, potable water and flood retention in reservoirs.