



A multi-criteria approach to risk assessment of a cascade dam-break on the Victoria Nile

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BACKGROUND

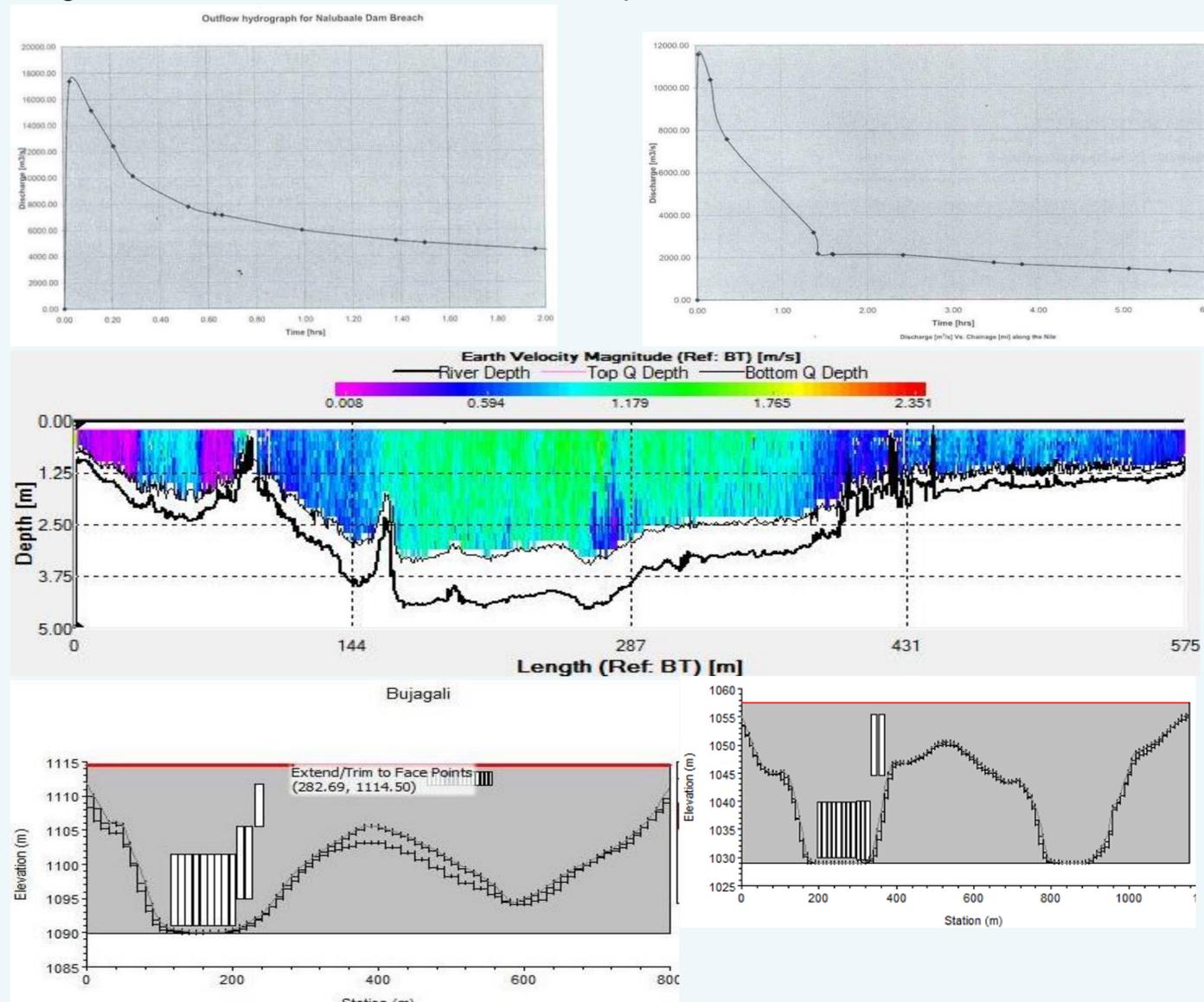
Large dams play an important role in promoting economic and social development in many countries. Though damming activity has many beneficial aspects, it brings several kinds of threat to the people settled near the dam. The failure of Nalubale dam and its extension, Kiira dam is of particular concern because its failure has the potential to cause destruction of other dams like Bujagali and Isimba dam downstream.

OBJECTIVES

- To determine peak outflow hydrograph at Bujagali and Isimba dam when dam break occurs by either overtopping or piping mode of failure
- To develop inundation maps showing the extents of the potentially inundated area

METHODS

Three criteria were identified for multi criteria analysis. A cascade dam break Impact index which represents the level of impact associated with a dam in a cascade dam break was developed. The weights of the peak outflow discharge were assumed to be equal while the warning time should serve to reduce the magnitude of the Cascade dam break Impact index



RESULTS

- In the event of failure, results indicate that Bujagali (on the left) and Isimba dam (on the right) will likely be over topped. The multi-criteria risk assessment indicates that Isimba dam break poses the greatest risk of destruction.

CONCLUSION

- More cross-sectional determinations of the river need to be carried out.
- Some building structures and power transmission areas of Bujagali and Isimba dam should be relocated because they are within the probable flood zone.
- A DEM of a better resolution for more accurate results is recommended. The resolution of the Digital Elevation Model used was 30m.