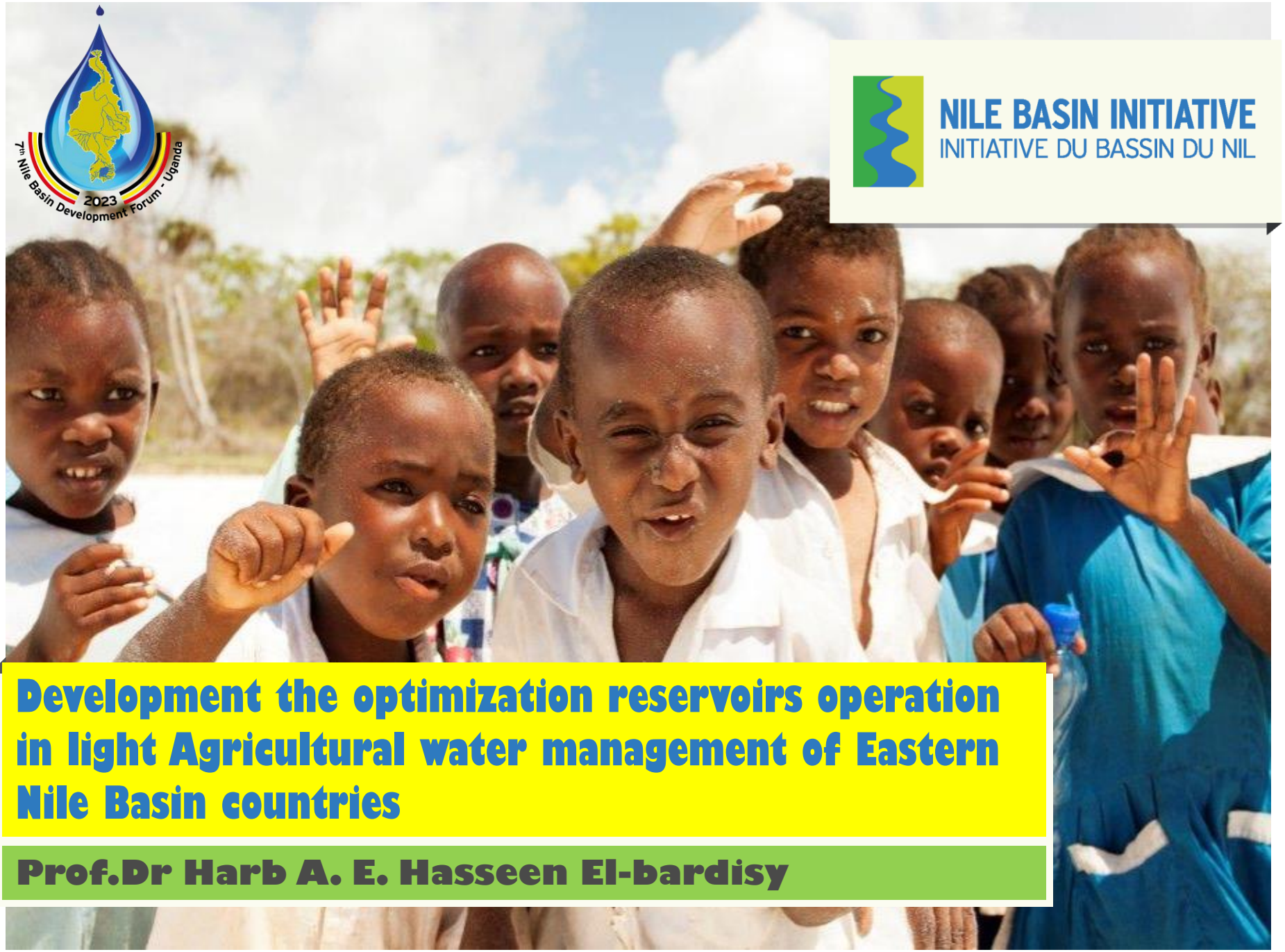

Development the optimization reservoirs operation in light Agricultural water management of Eastern Nile Basin countries

Prof.Dr Harb A. E. Hasseen El-bardisy

The topic relates NBDF theme.

- **Webinar CS6:** Applying analytical and monitoring tools to improve climate change adaptation in the agricultural sector.

This presentation will be covering tow topics are:

2) Agricultural water management.
5) reservoir operation optimization

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The affiliation

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Presentation Tillite: "Development the optimization reservoirs operation in light Agricultural water management of Eastern Nile Basin countries"

Background

Most of people of the Eastern Nile (EN) countries farmers, live below the poverty line, and depend on the Nile for their livelihood, food, and nutrition security, The EN Countries of Egypt, Sudan, South Sudan, and Ethiopia shares similar factors to many water conflicts (Genderen & Rood, 2011). The growing population will affect food and nutrition security levels in the EN, by increasing the demand for water resource ((ENTRO, 2018).

The contribution

It will be check out the optimization reservoirs operation in light Agricultural water management of Eastern Nile Basin countries from the development and operation of the Grand Ethiopian Renaissance Dam while protecting baseline flows to the downstream countries including flows into the Egyptian High Aswan Dam.

The Objective

Check out the optimization reservoirs operation in light Agricultural water management of Eastern Nile Basin countries from the development and operation of the Grand Ethiopian Renaissance Dam while protecting baseline flows to the downstream countries including flows into the Egyptian High Aswan Dam.

This analyze has studied the potential for Pareto-Efficient Benefit Sharing in the Nile Basin: New Evidence.

Methodology

An integrated approach is formulating to bring the economics, hydrology, and institutions of the region into a unified framework for policy analysis. The optimization model is a dynamic developed and applied to measurement the efficient for operation in light Agricultural water management of Eastern Nile Basin countries, Improving measures to operate the reservoirs for the four Eastern Nile Basin countries: Ethiopia, South Sudan, Sudan, and Egypt by GAMS programing model.

The Results

a possibility for all country to be well off and no country to be worse off from a managed operation of these two storage facilities. Still, despite the optimism of our results, considerable a water diplomacy negotiation among the Eastern Nile Basin countries will be required to improvement the Agriculture management water.

The Results Con….

The optimization model will developed to identify the potential of Pareto Improving operation that guards against negative impacts associated with the development of the GERD for the four Eastern Nile countries: Ethiopia, South Sudan, Sudan, and Egypt.

The associated economic values were among the variables optimized to identify the potential impacts and benefits of the GERD.

Discounted total economic benefits over a 20-year period for each country can be at least as large with both dams in place as with only the existing High Aswan Dam.

Total Economic Benefits by Country, Water Supply Scenario, Policy, and Water Use ($ US Million Discounted, Summed over 20 Year Time Horizon).

Country	Climate	Policy	Irrigation Benefit	Energy Benefit	Recreation Benefits	Dam Cost	Gross Benefit	Net Benefit
Ethiopia	base	wo_dam	16,595	0	0	0	16,595	16,595
		wi_dam	12,890	10,057	237	4,600	23,184	18,584
	dry	wo_dam	13,231	0	0	0	13,231	13,231
		wi_dam	10,404	7,573	175	4,600	18,152	13,552
South Sudan	base	wo_dam	1,754	0	0	0	1,754	1,754
		wi_dam	1,755	0	0	0	1,755	1,755
	dry	wo_dam	1,754	0	0	0	1,754	1,754
		wi_dam	1,754	0	0	0	1,754	1,754
Sudan	base	wo_dam	12,868	0	0	0	12,868	12,868
		wi_dam	12,868	0	0	0	12,868	12,868
	dry	wo_dam	12,868	0	0	0	12,868	12,868
		wi_dam	12,868	0	0	0	12,868	12,868
Egypt	base	wo_dam	141,406	9,913	11,672	0	162,991	162,991
		wi_dam	142,185	9,955	11,672	0	163,811	163,811
	dry	wo_dam	99,425	7,286	9,424	0	116,135	116,135
		wi_dam	100,068	7,318	9,424	0	116,810	116,810
	base	wo_dam	172,623	9,913	11,672	0	194,208	194,208
		wi_dam	169,697	20,013	11,909	4,600	201,618	197,018
	dry	wo_dam	127,277	7,286	9,424	0	143,987	143,987
		wi_dam	125,093	14,891	9,600	4,600	149,583	144,983

the recommendations to deepening Nile cooperation and advancing the theme of the 7th NBDF

This opportunity for an improvement an efficient benefit sharing result could provide a real motivation for dialogue and cooperation among these countries.

Findings from this research have the potential to inform multilateral negotiations through information provided by results of our optimized water sharing constrained by the requirements of a politically acceptable benefit sharing arrangements.

these findings also could guide unilateral decision making for each riparian country as our results also show economically optimized cropping and hydropower production patterns.

The results of this research could serve as guidance for win–win negotiations between Ethiopia and Egypt, from which the former could be relieved from its age-old burden of poverty and hunger and the latter seeing protection of its water supply.


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