The river transportation along the reach Barber-Khartoum-Kosti

The Hydraulics Research Center

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Navigation in Sudan

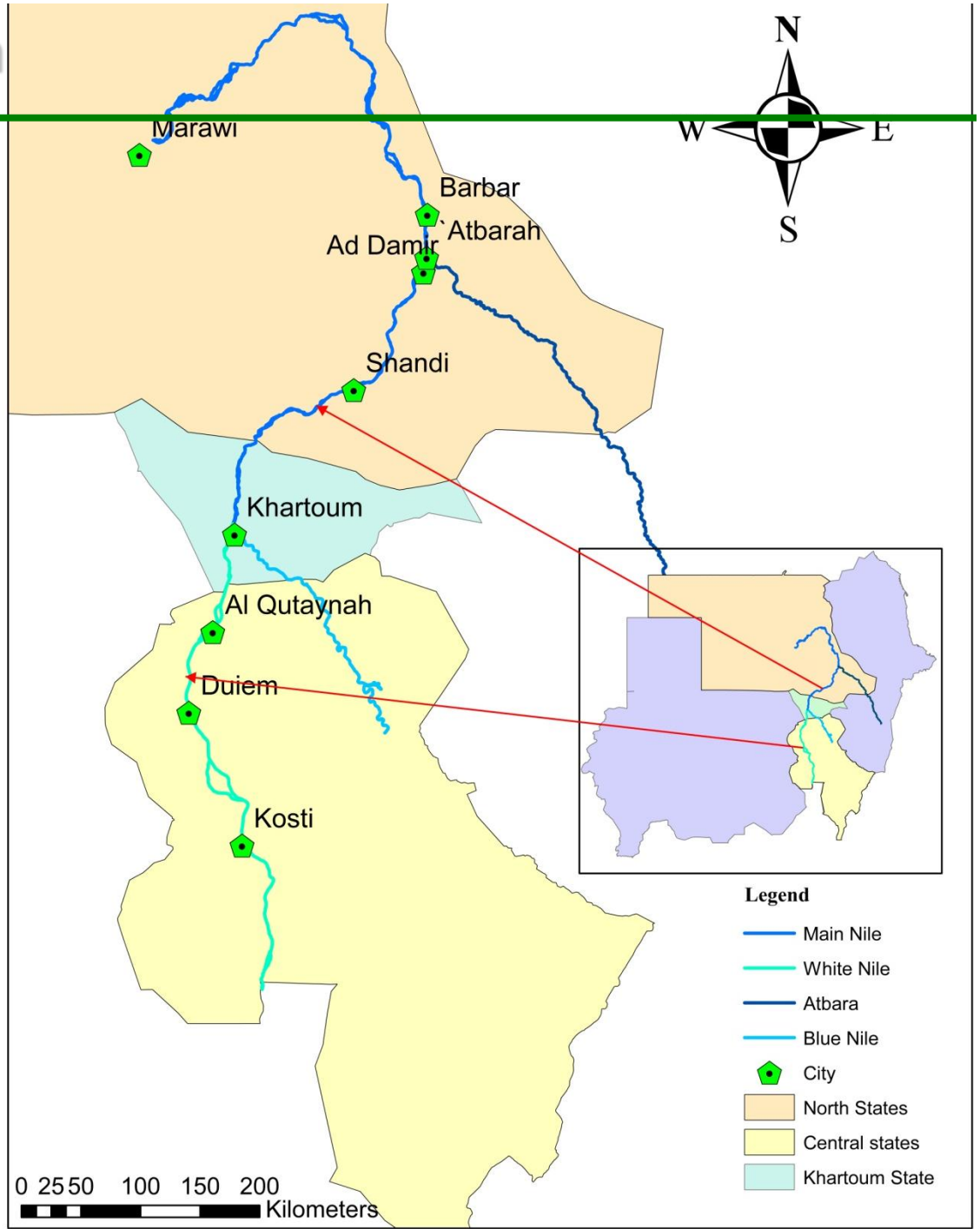
- Inland navigation is a missed potential in Sudan
- Kosti to Juba.
- Karima to Dongola
- Target 6 million tonnes :
  1. sugar
  2. cement
  3. steel bar
  4. Oil

Navigation in Sudan

Study for River navigation Department

Navigation in Sudan

- Passing 3 States
- 2 rivers
- Crossing many cities



Why navigation is important (economic)

Khartoum and Barbar line:

- Cement factories.
- Agriculture products (winter).
- Easy and safe transportation.

Khartoum and Kosti line:

- Sugar factories.
- Cement factory.
- Easy and safe transportation.

Objectives

The main objective

- investigate the potential of inland river transportation in Sudan.

The specific objectives :

- ✓ Navigation path (30 m width and 3 m depth),
- ✓ Location of obstacles in maps and tables
- ✓ Quantities of rock and sand to be removed.

Approach

The methodology of this study is divided into five main parts

I. Field surveys,

II. Hydrological analysis.

III. Hydrodynamic modeling,

IV. Quantity survey (dredging), and

V. Preparation of the navigation charts and reporting.

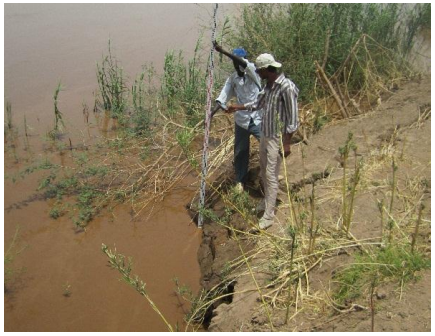
Field measurements results

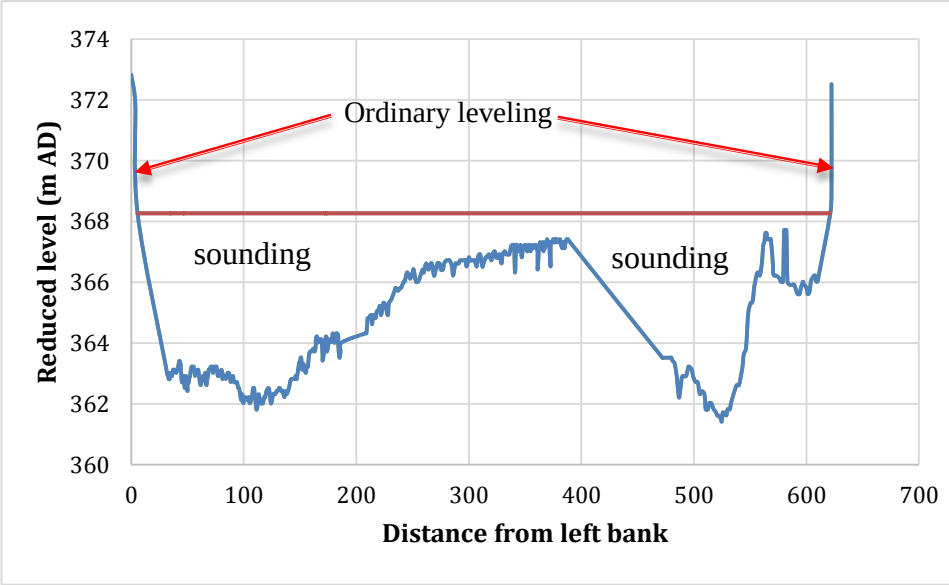
- ✓ Base line- Shambat Bridge -Barbar

- ✓ Walking, 500 km under the heat
- ✓ 330 newly collected cross sections.

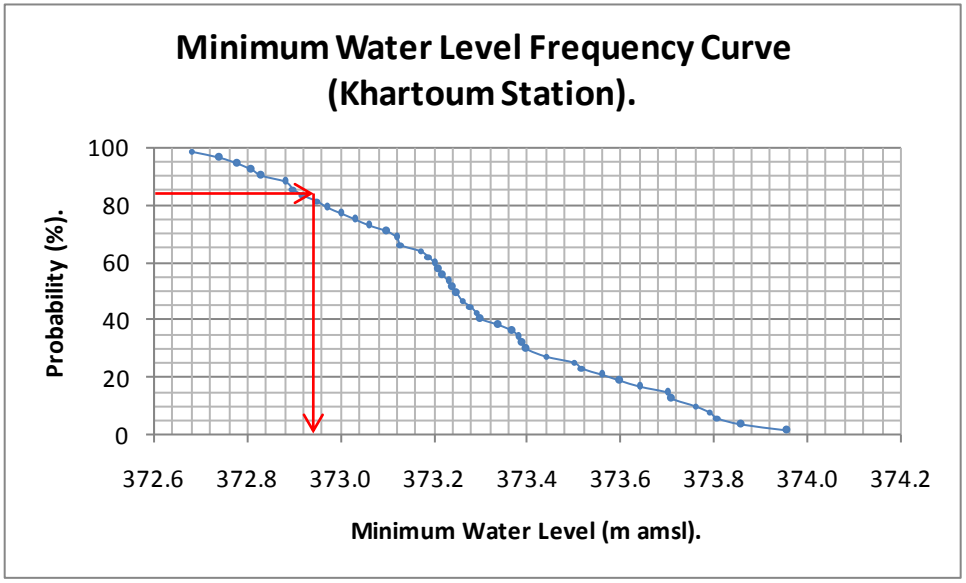
Data collection (Cross section development).

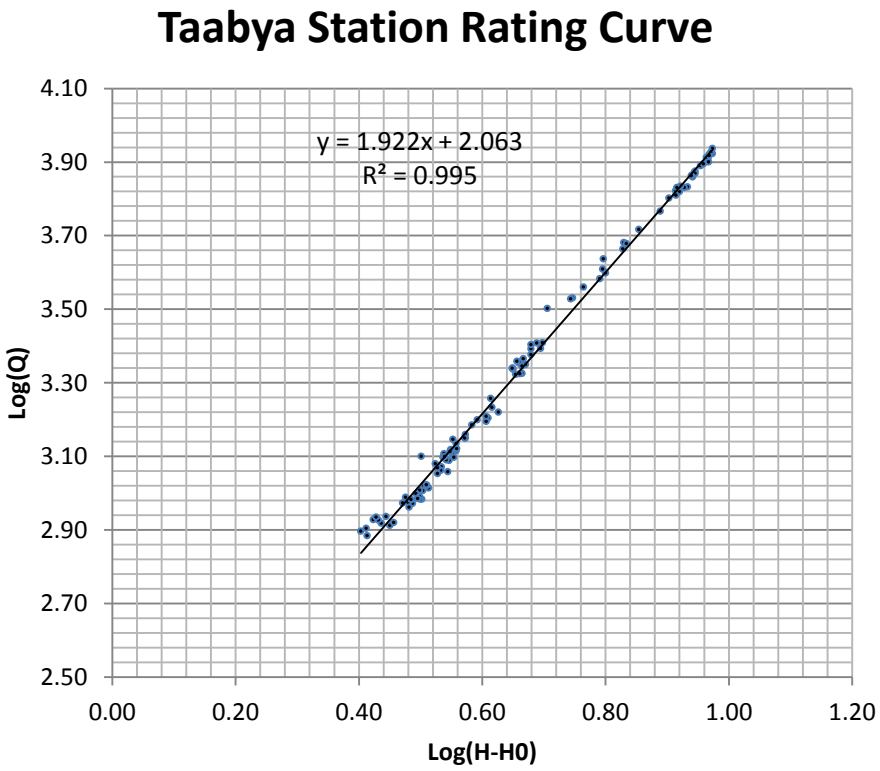
- ✓ Peg X to water level (land leveling)
- ✓ Sounding (inside water)
- ✓ Water level to haddam line (land leveling)



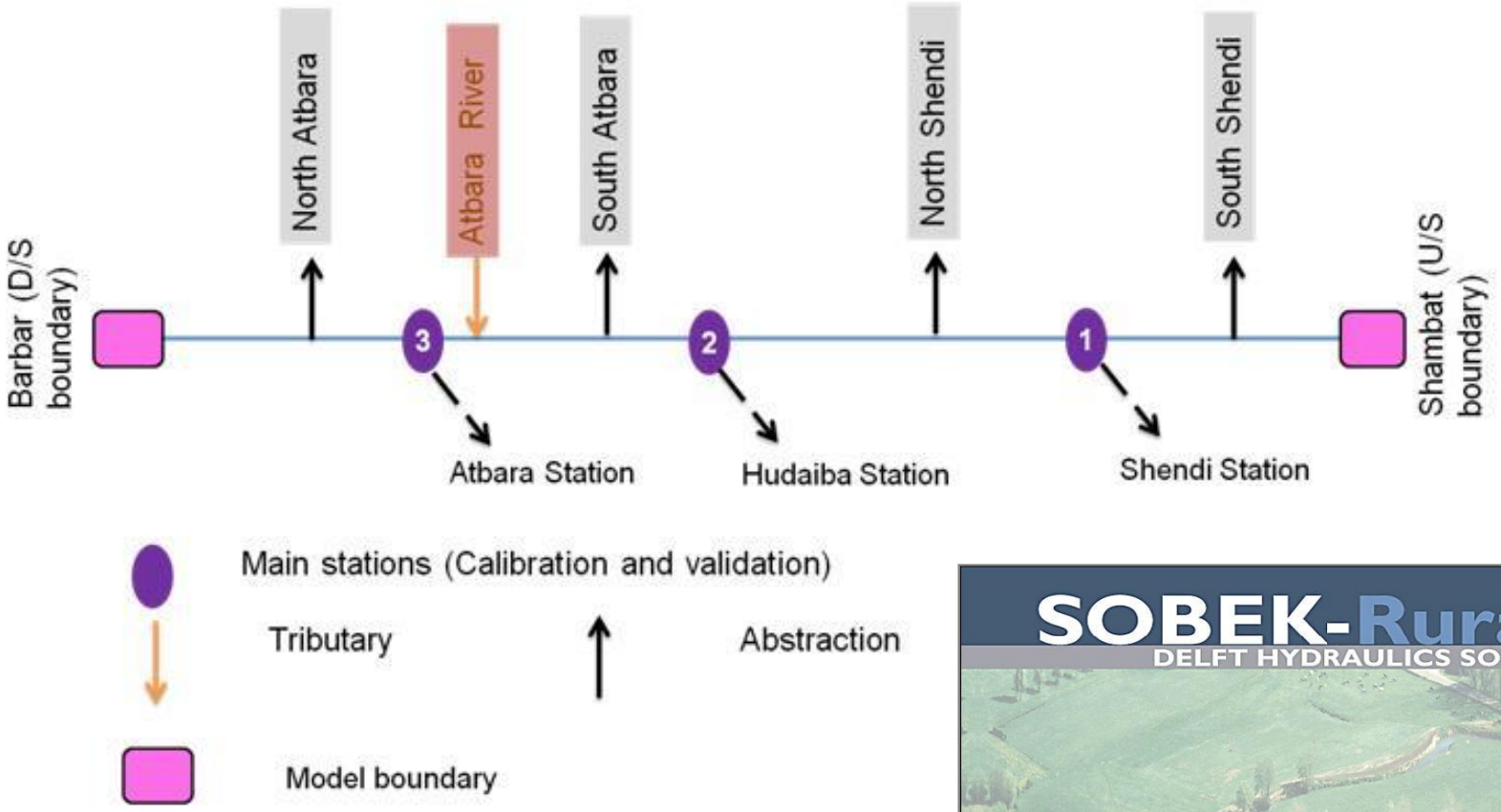


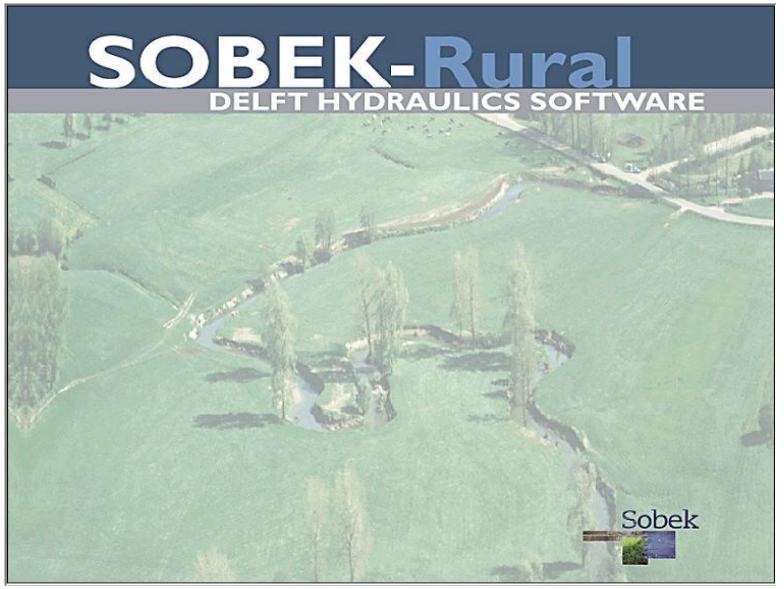
Hydrology results





Modelling results





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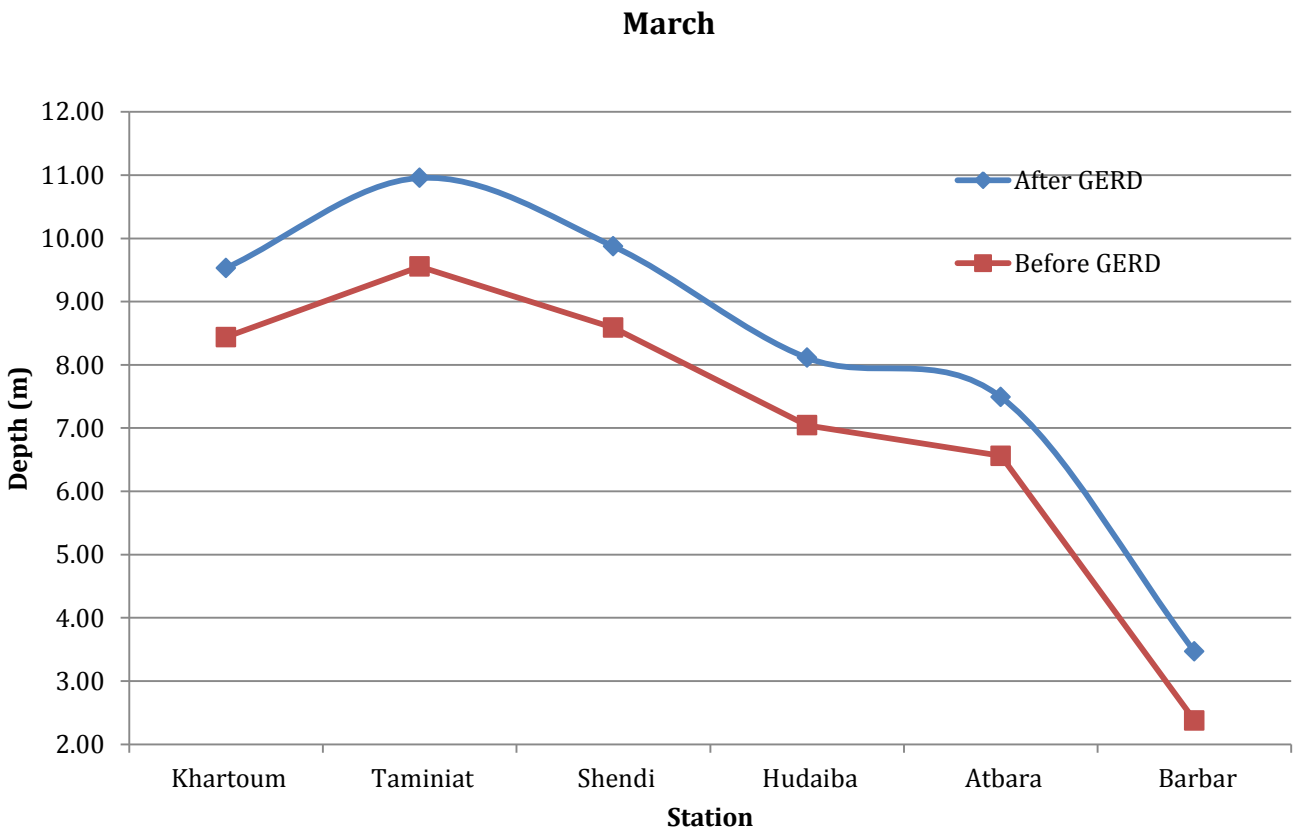

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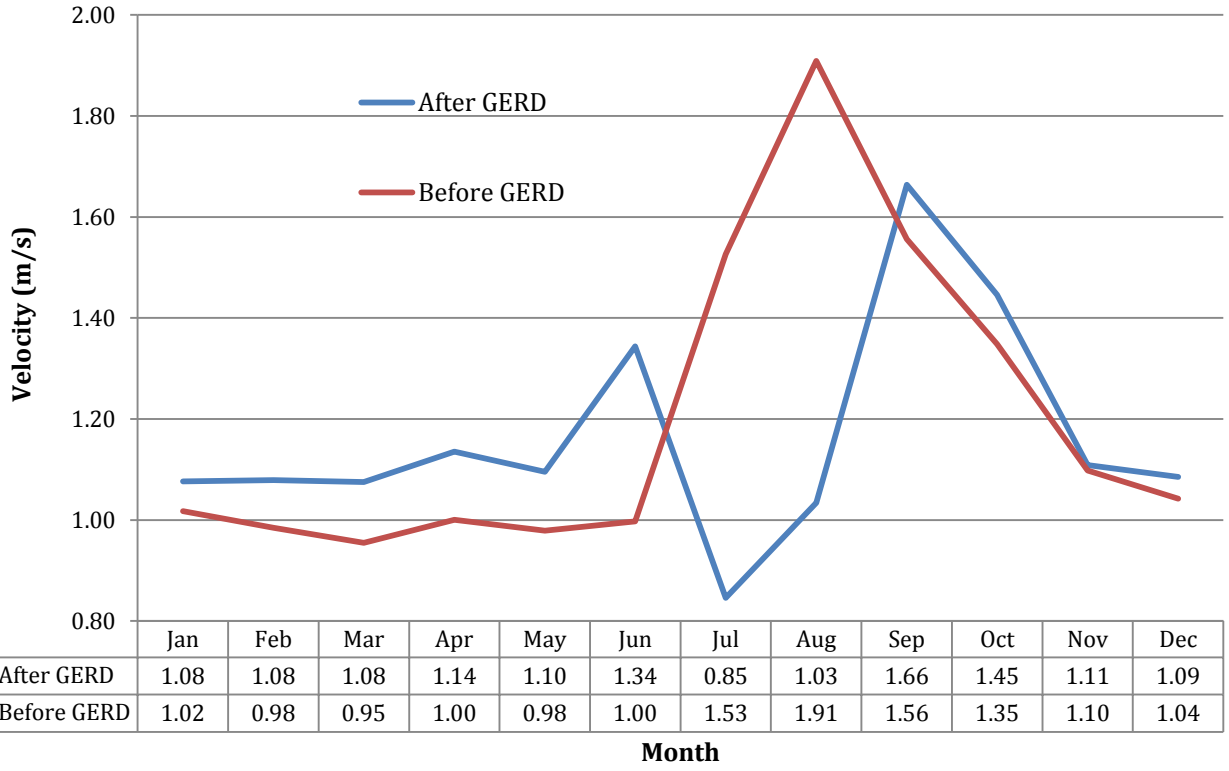


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
After GERD	1.08	1.08	1.08	1.14	1.10	1.34	0.85	1.03	1.66	1.45	1.11	1.09
Before GERD	1.02	0.98	0.95	1.00	0.98	1.00	1.53	1.91	1.56	1.35	1.10	1.04

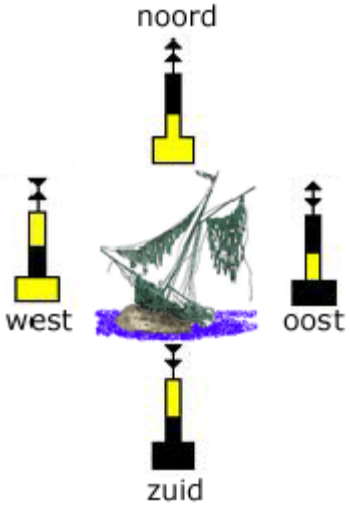
Monthly average velocity at location 322 km downstream Shambat Bridge.

Navigation charts and signs

Left buoys

Right buoys

Safe depth



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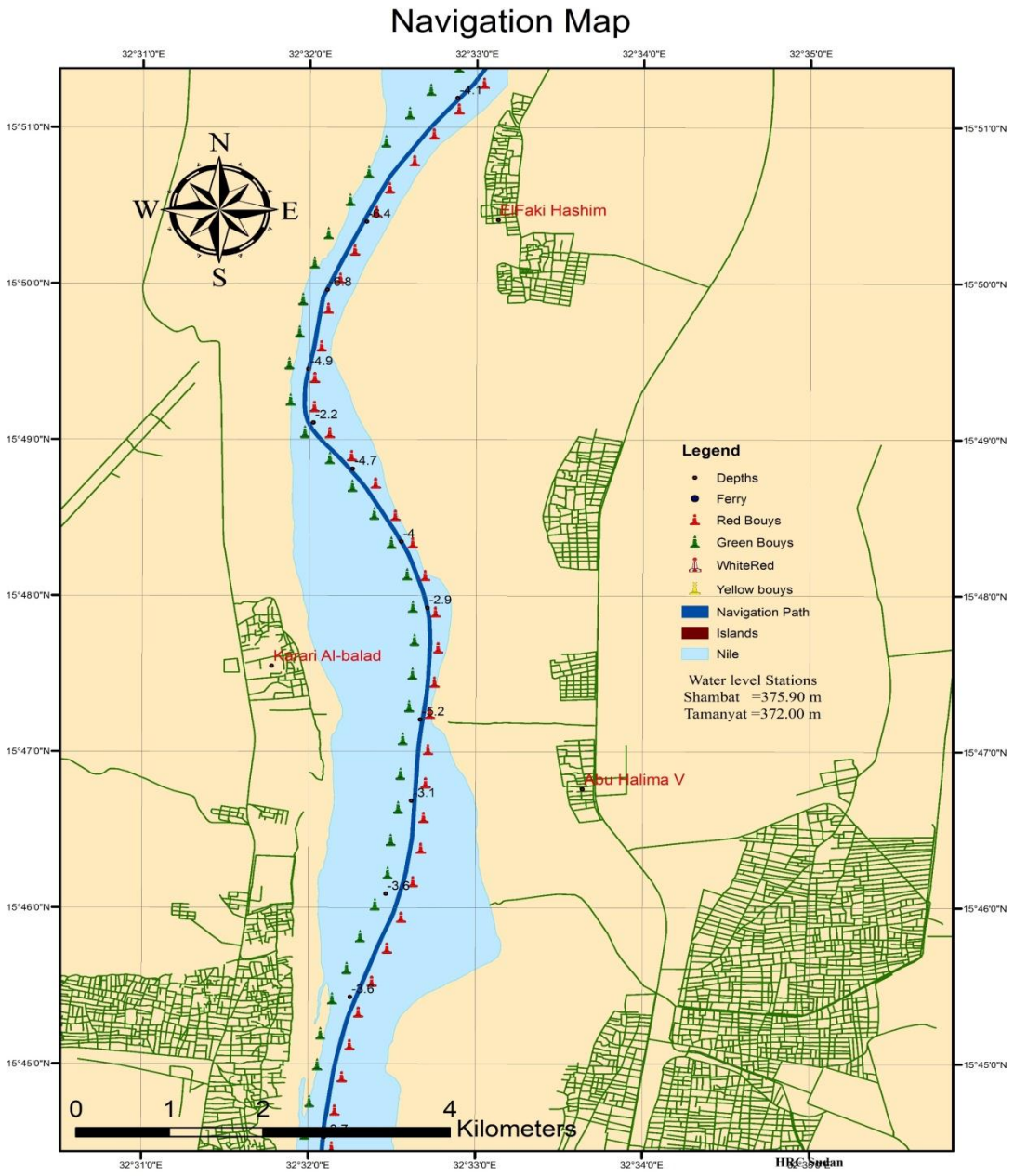

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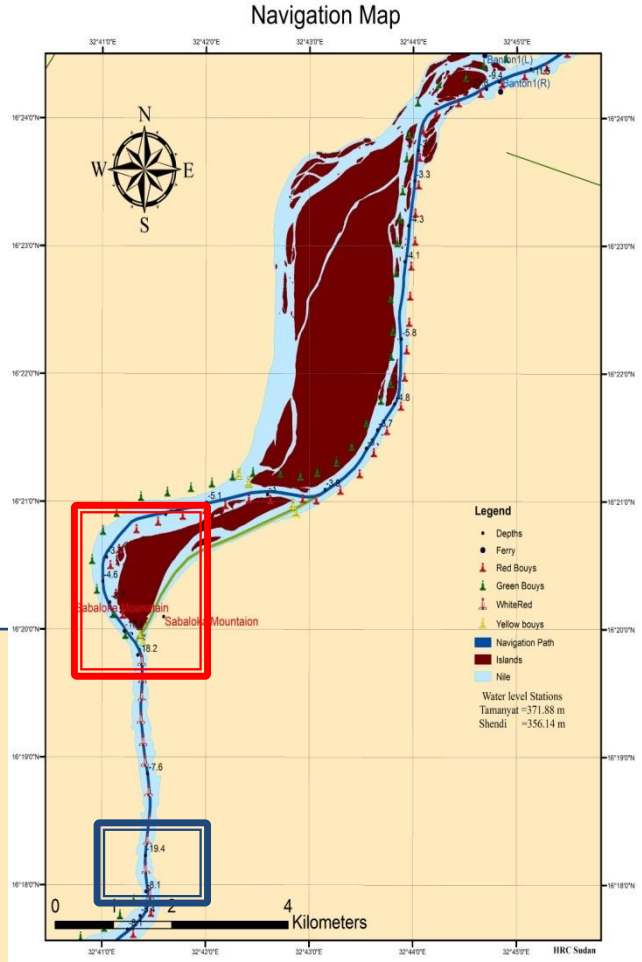

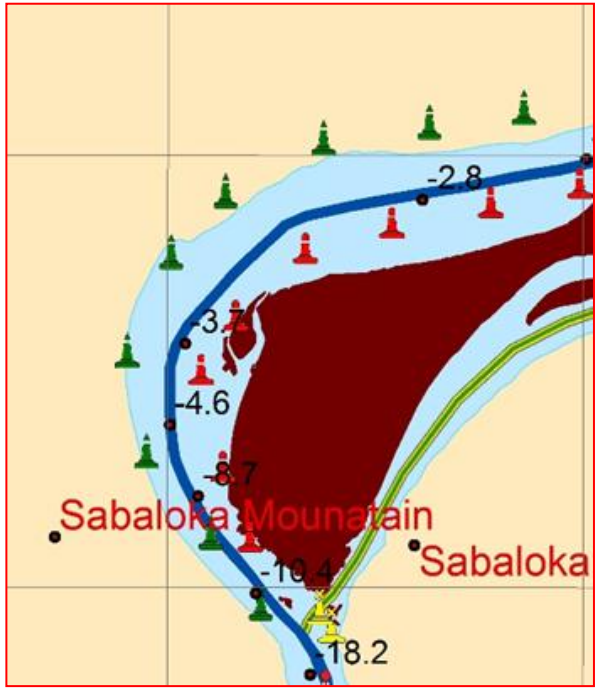

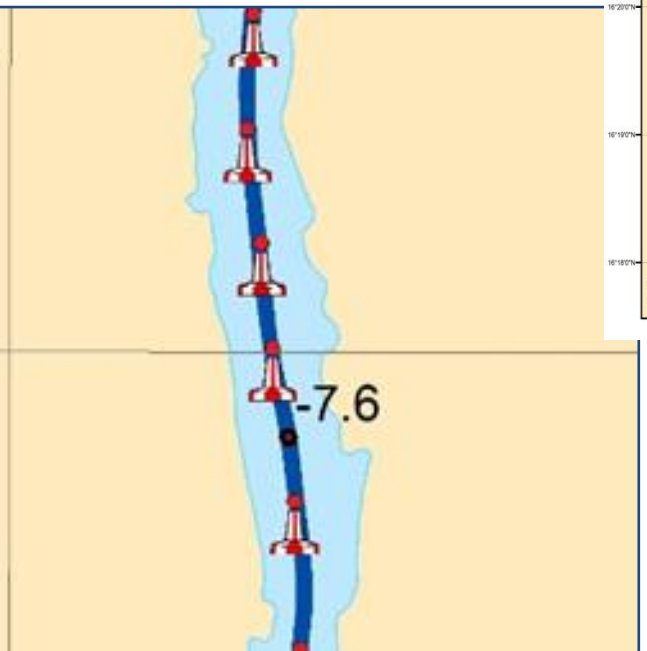

Conclusion.

- Bathymetric survey was conducted from Khartoum to Barbar, 400 km, 330 cross-sections.
- Secondary data HRC, DIU and EID at gauging stations.
- Model was developed for the MN, calibrated and validated.
- The model was used to assess the impact of GERD as well as navigation period for wet, average and dry years.
- Navigation signs and maps are prepared for MN
- Finally we are now doing the field work along the WN.


THANK YOU