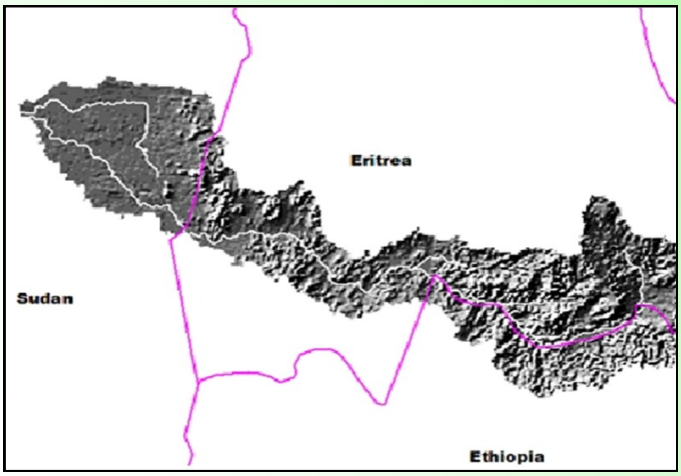
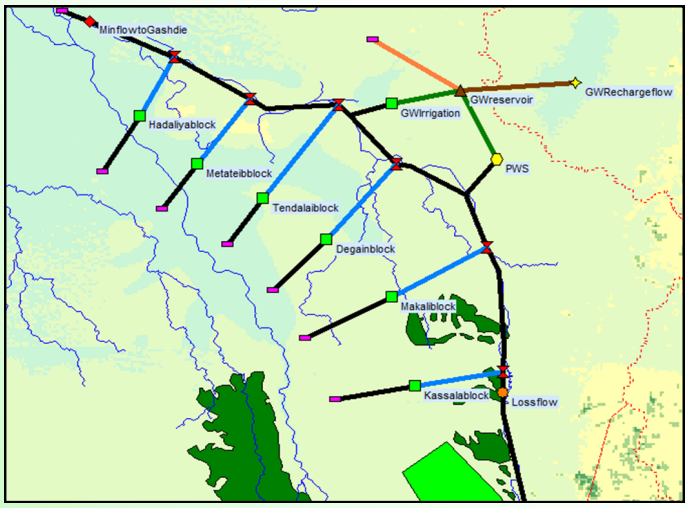
Water Resources Allocation of Gash River

Introduction

Gash River is characterized by its high seasonality. On average, it has an estimated annual yield of 680 Mm3. It is the only source of water in Kassala State and all the socio-economic activities depend on it.



Gash River Basin



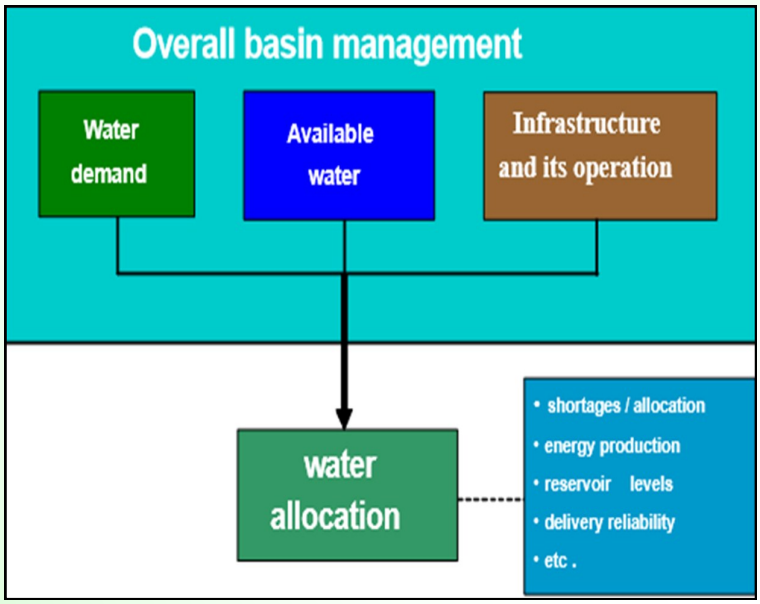
The Schematization of the Gash River Model

Objective

The main objective of this study is to optimally allocate the water resources of Gash River among the different water users namely Gash Agricultural Scheme, groundwater recharge, domestic water supply and environmental flow to Gash Die.

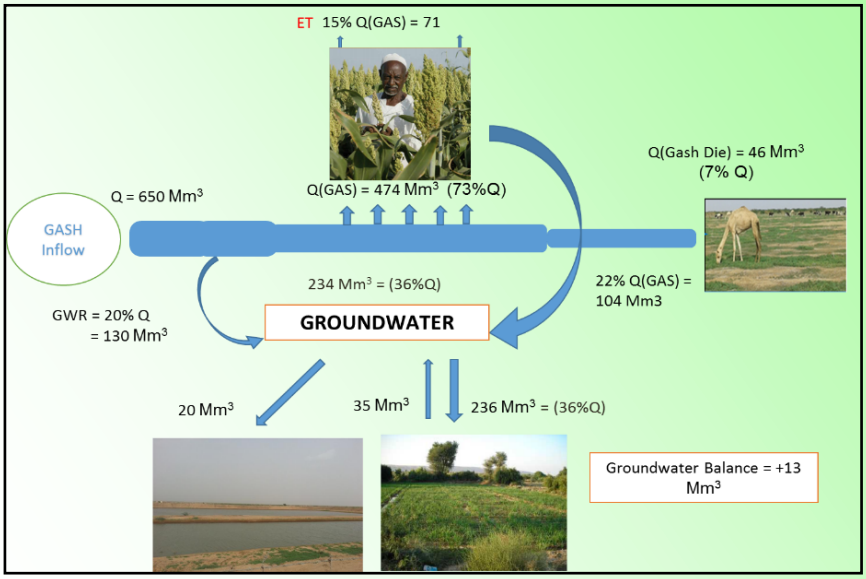
Methodology

- RIBASIM (**RI**ver **BA**sin **SIM**ulation) model is an effective tool to support the process of water resources planning and the analysis of water uses, sourcing and distribution
- It can be used to allocate different water resources at the river basin level by linking the hydrological inputs with the water uses.
- RIBASIM model is based on a water balance approach.



Baseline Results

The baseline water balance analysis which was based on the average requirements met all users' demands with +13 Mm^3 surplus storage in groundwater which in real is consumed by the Mesquite trees that its consumption was not included in this analysis.



Scenarios Results

Different scenarios were tested for the average year to determine the expansion possibilities for both Gash Agricultural Scheme (GAS) and Horticulture – Private Agricultural Scheme (PAS):

Scenarios		Sc.1		Sc.2		Sc.3
		(a)	(b)	(a)	(b)	
Annual Inputs and Demands	Gash Flow (Mm^3)	650	650	650	650	650
	GAS Area	>> 81420	>> 81420	81420	81420	81420
	Gash Die (Mm^3)	8	8	8	8	8
	PAS area	45000	45000	>> 45000	>> 45000	34000
	PWS (Mm^3)	20	20	20	20	20
Simulation Results Supply	GAS Areas (feddans)	88000	104000	81420	81420	81420
	Gash Die (Mm^3)	8	8	8	8	8
	PAS Areas (feddans)	45000	45000	48050	61500	34000
	PWS (Mm^3)	20	20	20	20	20
Surface water Balance (Mm^3)		0	0	0	0	38
Groundwater Balance (Mm^3)		13	13	0	0	63

Contact Information:

P. O. Box 318, Wad Medani, Sudan Tel: +249 511 843220 - 843221 Fax: +249 511 859700

Website: www.hrc-sudan.sd E-mail: info@hrc-sudan.sd