

## Improved Agricultural Water Management In the Nile Basin

### Interventions Analysis – Hydronomic Zoning

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#### 1. Introduction

- The Nile basin exhibits greater topographic, climatic and hydro-ecological variability
- Water management interventions should be very specific and most adaptable to different parts of the basin
- Water management zones (hydronomic zoning) are required for developing water management strategies and informed decision making

#### 2. Materials and Methods

- Collate and investigate bio-physical factors relevant to water management in Nile basin
- Analyze the bio-physical factors using spatial-multivariate technique (Principal Components Analysis)
- Identify hydronomic zones from unsupervised classification of principal components and hierarchical classification of dominant factors

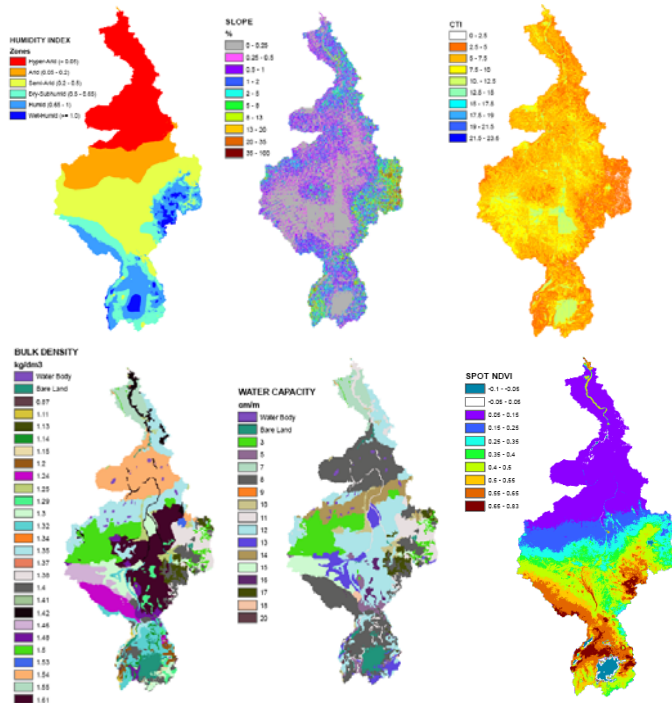


Figure 1: Selected bio-physical factors for hydronomic zoning analysis (from top-left clockwise): humidity index (HI), landscape slope (Slope), compound topographic index (CTI), SPOT NDVI, available soil water content (SWC), and soil bulk density (SBD)

#### 3. Results

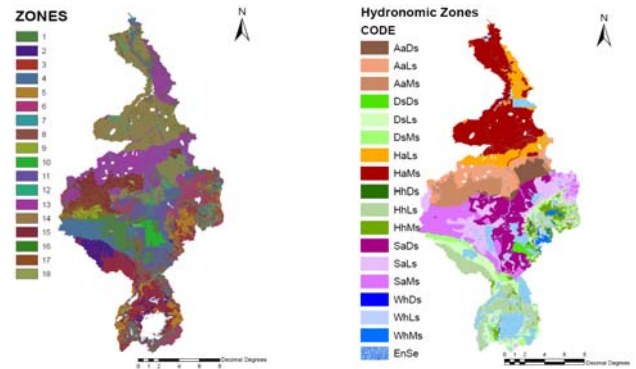


Figure 2: Hydronomic zones of the Nile basin from unsupervised classification of PCs (left) and hierarchical classification of dominant bio-physical factors (right – symbols defined in Table 1).

Table 1: The identified hydronomic zones of the Nile basin and their proportional areas.

SN	Zone Name	Zone Code	Zone Area, 10 <sup>6</sup> km <sup>2</sup>	Percentage of Basin Area
1	Hyper Arid – Light Soil	HaLs	537.45	17.22
2	Hyper Arid – Medium Soil	HaMs	0.00	0.00
3	Hyper Arid – Dense Soil	HaDs	179.45	5.75
4	Arid – Light Soil	AaLs	196.29	6.29
5	Arid – Medium Soil	AaMs	188.26	6.03
6	Arid – Dense Soil	AaDs	78.24	2.51
7	Semi Arid – Light Soil	SaLs	276.41	8.86
8	Semi Arid – Medium Soil	SaMs	265.43	8.51
9	Semi Arid – Dense Soil	SaDs	280.94	9.00
10	Dry Subhumid – Light Soil	DsLs	189.30	6.07
11	Dry Subhumid – Medium Soil	DsMs	85.21	2.73
12	Dry Subhumid – Dense Soil	DsDs	23.52	0.75
13	Humid – Light Soil	HhLs	296.99	9.52
14	Humid – Medium Soil	HhMs	80.76	2.59
15	Humid – Dense Soil	HhDs	4.11	0.13
16	Wet Humid – Light Soil	WhLs	23.56	0.75
17	Wet Humid – Medium Soil	WhMs	27.87	0.89
18	Wet Humid – Dense Soil	WhDs	0.09	0.003
19	Environmentally Sensitive	EnSe	351.49	11.26
20	Unclassified		35.24	1.13
	<b>Total</b>		<b>3120.59</b>	<b>100.00</b>

#### 4. Conclusions

- Potential water management interventions could be mapped into the 19 hydronomic zones of the basin
- Environmentally sensitive zone defines wetlands and protected areas (about 10% of the basin)
- The water source zones (humid and wet humid primary classes) account for less than 15% of the basin