



# Application of ecosystem services concept in development of a catchment plan. A case study of Namatala wetland system, Eastern Uganda

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# Introduction...../ I

## Importance of wetlands

- ✦ Wetlands serves an estimated 3 million people with direct services such as water, fish construction materials, food crops & livestock grazing
- ✦ Wetlands are important for regulating services; nutrient retention, wastewater treatment, flood control & water storage

## Recognizing wetlands as important resources led to wetland management strategy;

- ✦ Development of the institutional framework
- ✦ Development of policies & legislation
- ✦ Creating awareness, appreciation of wetland functions, wetland inventory
- ✦ Development of wetland management plans

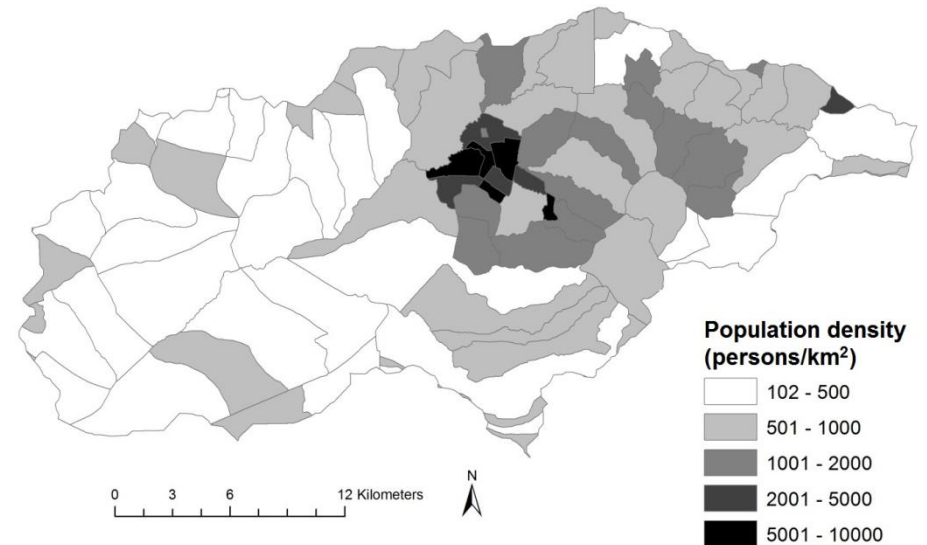
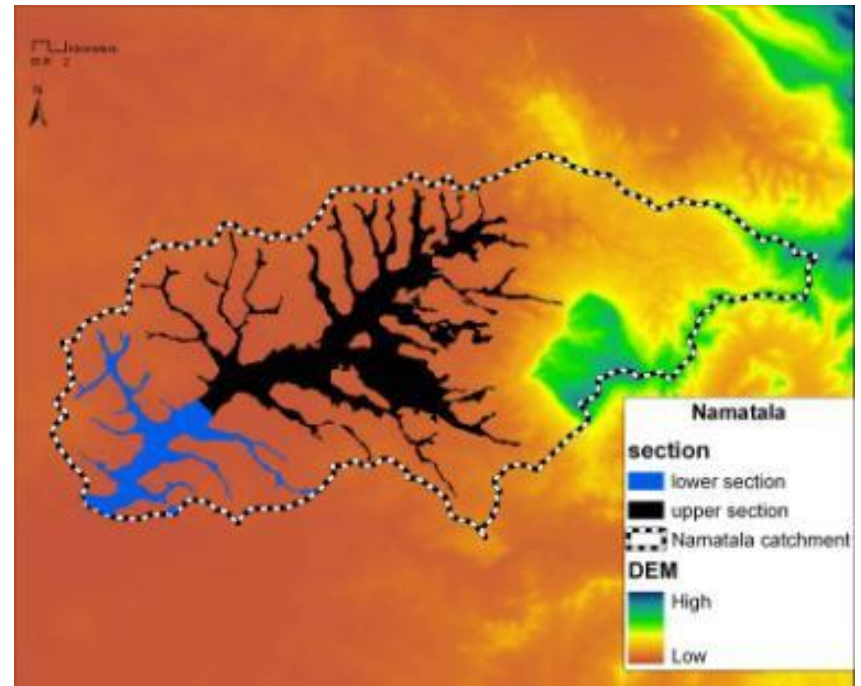
## Introduction...../2

Despite the recognition of wetland services & well – developed policy framework, wetland degradation is still widespread;

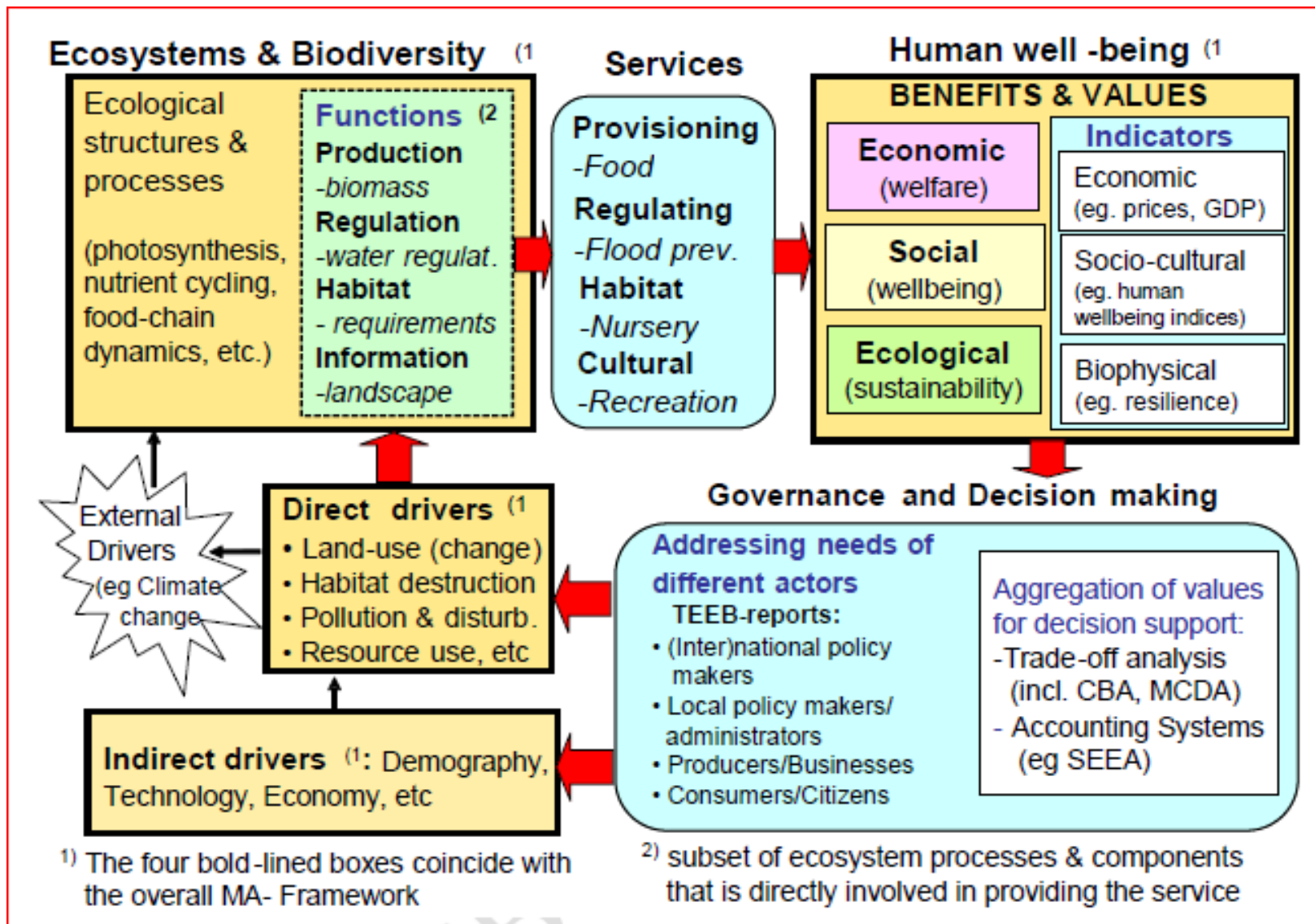
- + A single wetland has diversity of services leading to multiple wetland uses
- + Many of the wetlands are used for agriculture leading to overexploitation and pressures on regulating services
- + Sustainable management approaches to balance provisioning & regulating services of the wetlands is constrained by **information deficiencies**; lack of participatory approaches; policy conflicts & limited institutional capacity

# Geographical context

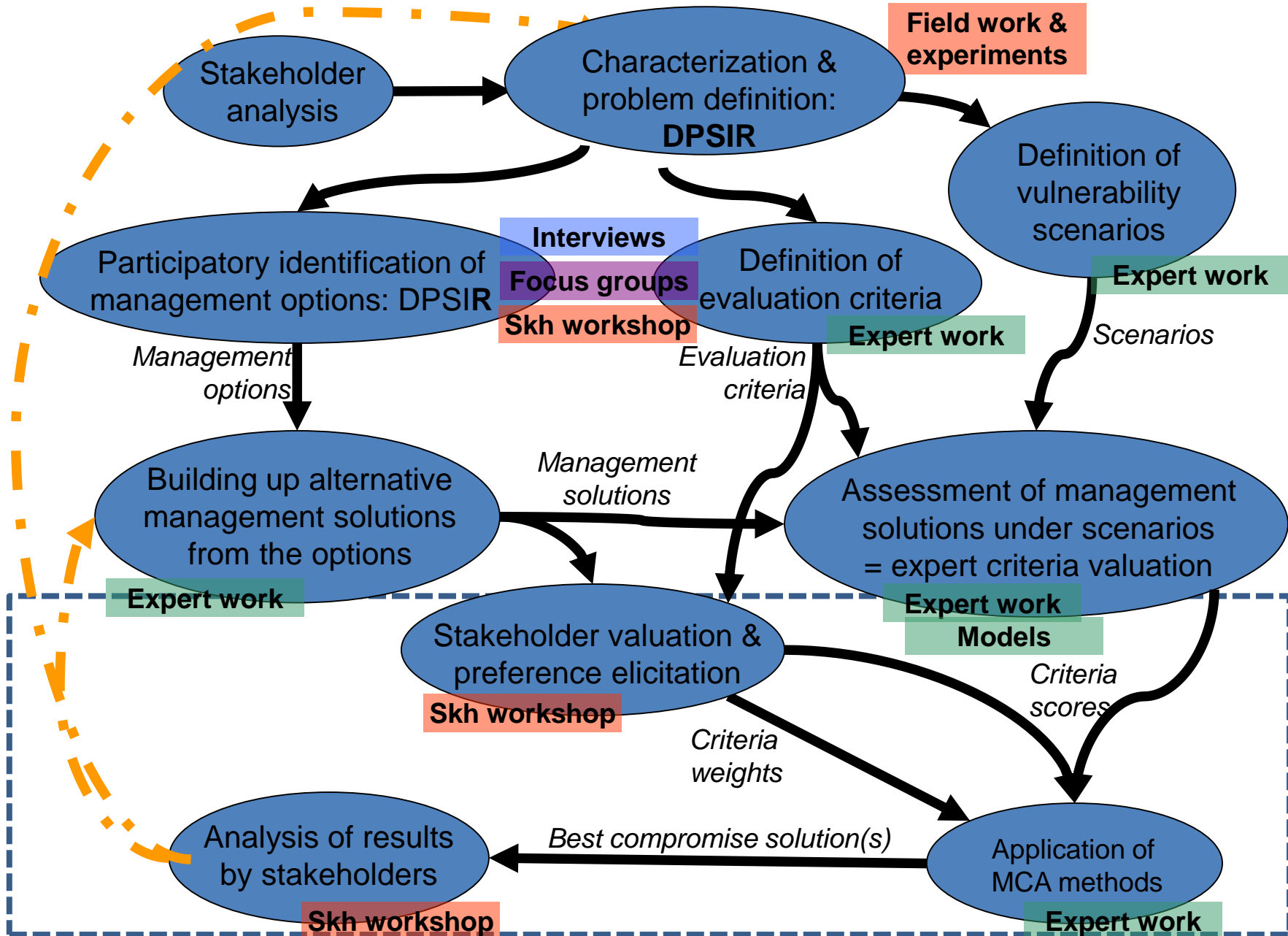
- Wetland area : 260 km<sup>2</sup>
- Altitude: 3,550 – 3,700 m
- Highly populated region



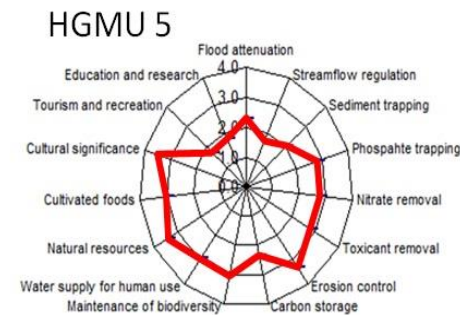
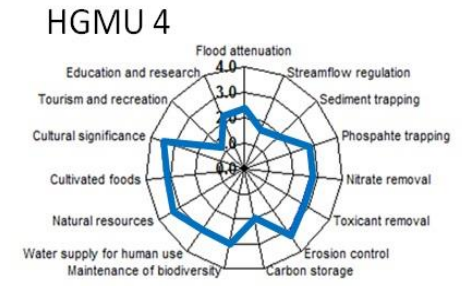
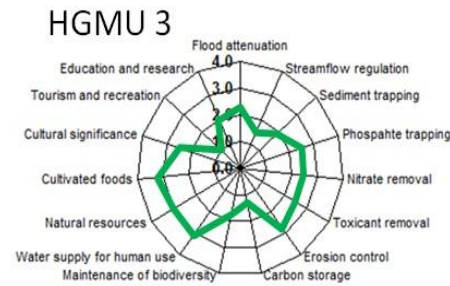
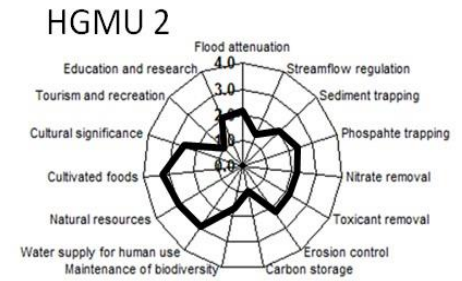
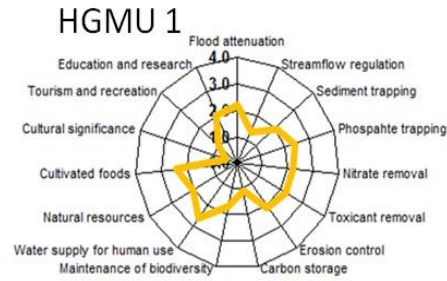
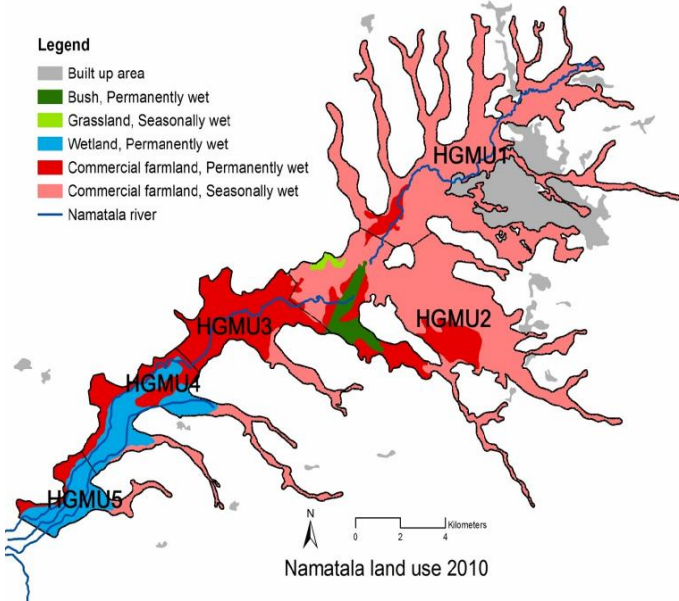
# Approach...../ TEEB-conceptual framework



# Methods

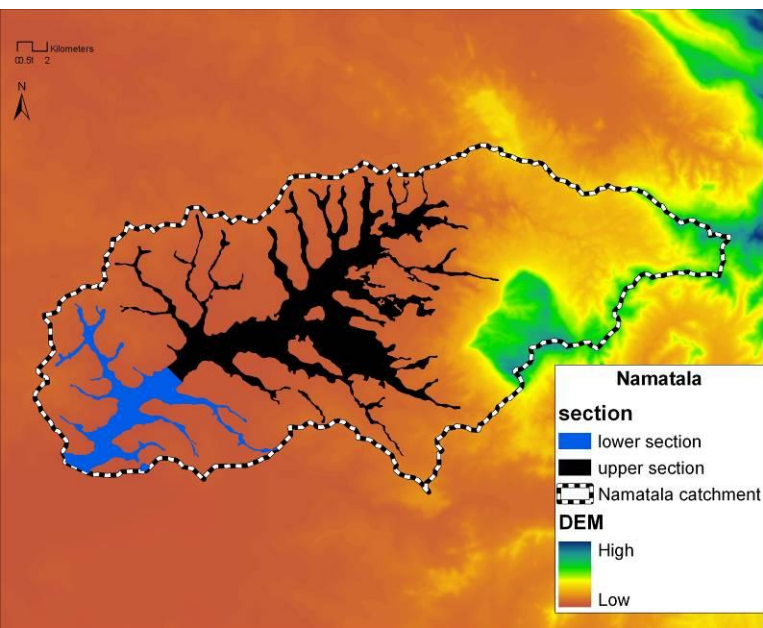


# Ecosystem Services

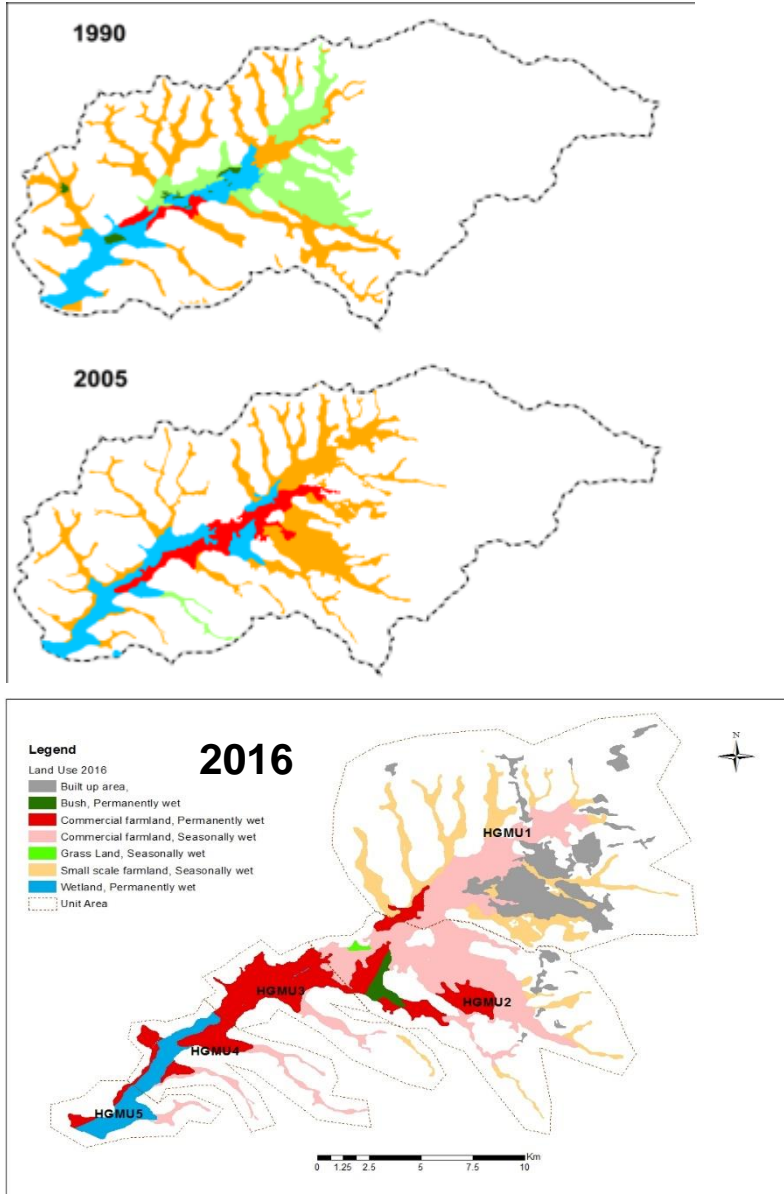


Ecosystem service	Score for HGMU no.				
	1	2	3	4	5
Provisioning	2.3	3.0	3.1	3.2	3.1
Regulating	1.9	1.9	2.1	2.5	2.5
Cultural	1.2	1.8	1.8	2.3	2.3
Habitat	1.6	1.8	1.8	3.0	3.0

(Source: Namaalwa et al. 2013)



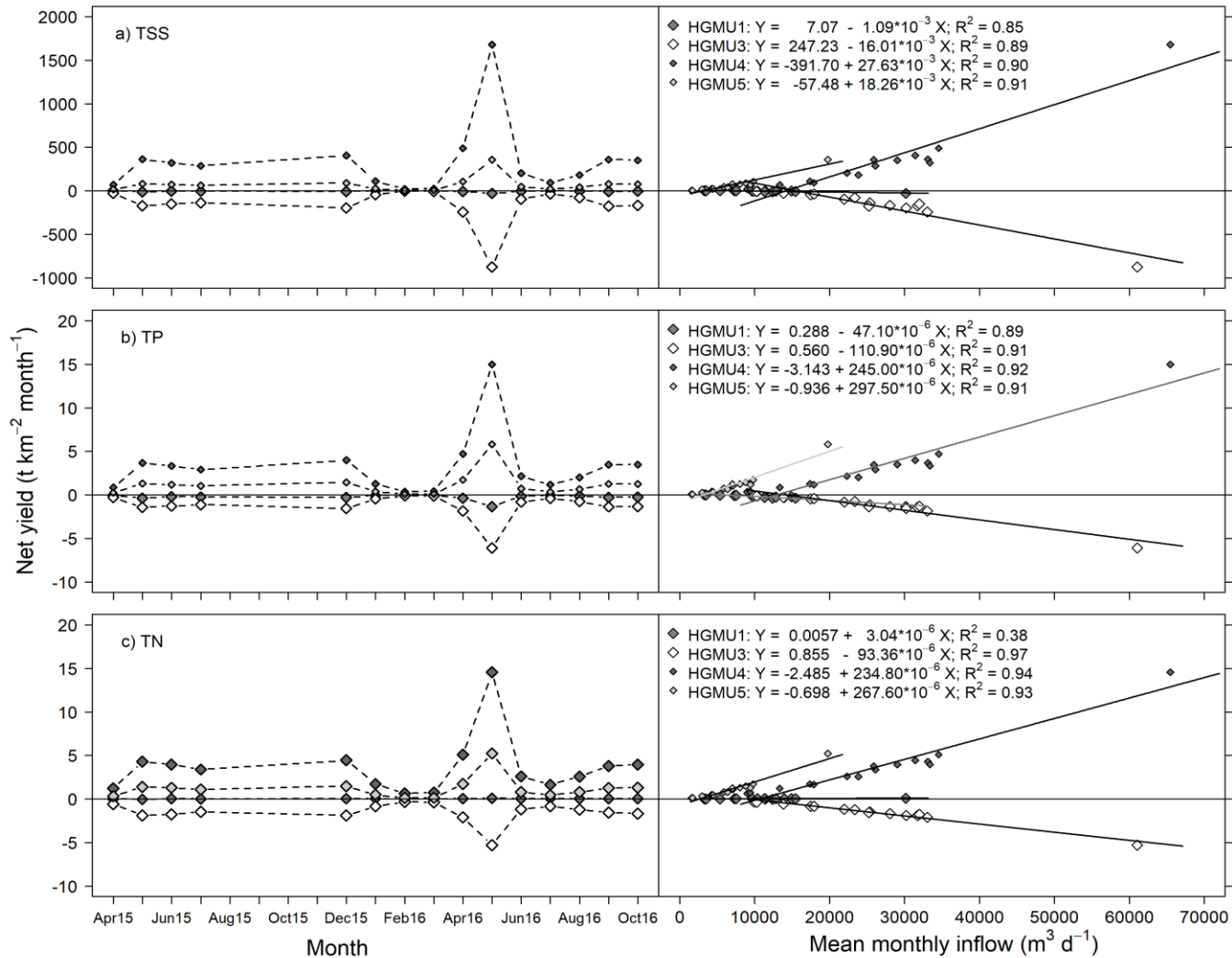
# Wetland drivers & pressures



- ✚ Agricultural encroachment
- ✚ Pollution – Urban & agricultural run off
- ✚ Diversion of streams

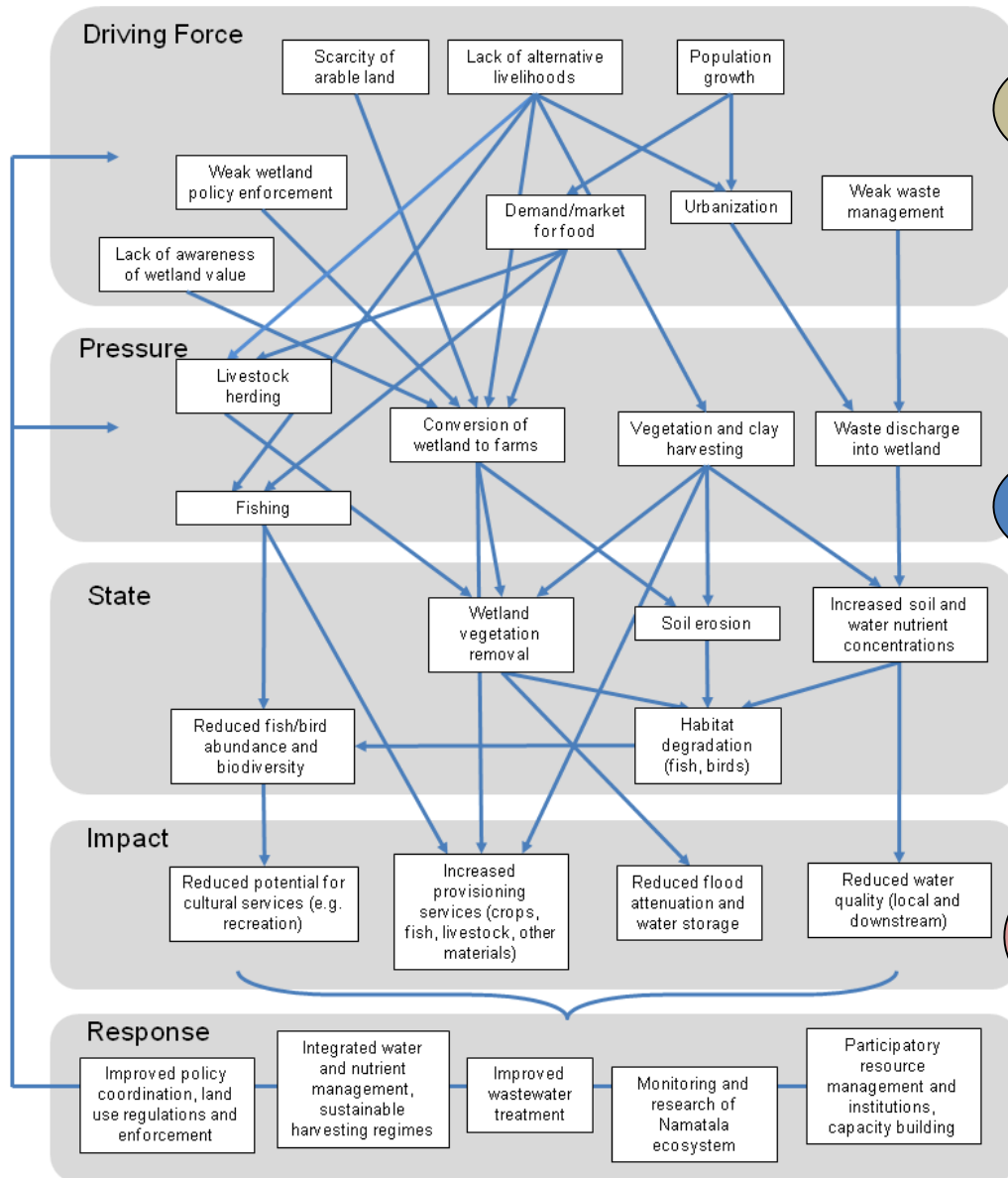


# Dynamics of Ecosystem services: WQ regulation



Net yield of total suspended solids (TSS), total phosphorus (TP) and total nitrogen (TN) in HG MUs 1, 3, 4 and 5

# Problem analysis : Results from the DPSIR framework



Key problems  
Water pollution  
Agricultural encroachment

Possible trade-offs

Management objectives  
Water quality improvement  
Land use change & management  
Conservation of the lower wetland part

# Implications from the current status of the wetland

- ✦ The continued crop expansion in the wetland is changing the ecological structure of the system and thus affecting mainly the regulation and biodiversity ES
- ✦ High concentrations & loads of TN and TP in HGMU 1 & 2 indicate a great influence of the agricultural practices & urban catchments upstream
- ✦ The high loads of nutrients during the wet season highlight the impact of the hydrology particularly seasonal rainfall and stream flow on the water quality of the wetland
- ✦ The high concentration of mainly TSS and TP in the downstream HGMU 3 & 4 is likely due to the intensive tillage & channelization of streams

# Possible management solutions for Namatala

Mgt response	Mgt Option	Alternative	MS0 BAU	MS1 Realistic sustainable management		MS2 Ambitious sustainable mgt	
			I	Ia	Ib	2a	2b
A: Land use planning in upper wetland	A1: BAU	A.1.1 BAU	X				
	A2: Sustainable agriculture	A.2.1 Training in sustainable agricultural practices		X	X	X	X
		A.2.1 CBM plan for ecological management in upper wetland			X		X
	A3: Buffer strips	A.3.1 Buffer strips along Namatala river in upper wetland			X		X
		A.3.2 Replace agricultural land with papyrus in upper wetland				X	X
B: Land use planning in lower wetland	B1: BAU	B.1.1 BAU	X				
	B2: Sustainable use	B.2.1 Training on sustainable fishing in lower wetland		X	X	X	X
		B.2.2 Training on sustainable papyrus harvesting in lower wetland		X	X	X	X
		B.2.3 Awareness campaign among communities (churches, schools, etc.) on wetland values			X		X
	B3: Enforcement of conservation measures	B.3.1 CBWM plan for lower wetland			X	X	X
		B.3.2 Strict enforcement of wetland and land ownership policy					X

# Possible management solutions for Namatala

Mgt response	Mgt Option	Alternative	MS0 BAU	MS1 Realistic sustainable management		MS3 Ambitious sustainable mgt	
				1a	1b	2a	2b
C: Improving wastewater treatment facilities	C1: BAU	C.1.1 BAU	X				
	C2: Rehabilitation and improved mgmt	C.2.1 Rehabilitation		X			
		C.2.2 Rehabilitation and improved mgmt			X	X	
		C.2.3 Increase capacity and improved mgmt.					X
	C3: Buffer zone at discharge	C.3.1 Papyrus buffer zone		X			
		C.3.2 Papyrus buffer zone with harvesting regime			X	X	X

**THANK YOU**

