# VEGETATION CLASSIFICATION ALONG A HYDROLOGICAL GRADIENT: THE GOMOTI DISTRIBUTARY OF THE OKAVANGO DELTA

* Ntsima, N.E, Murray-Hudson, M., Masunga, G. and Fynn, R.W.S

Okavango Research Institute, Private Bag 285, Maun, Botswana.
* Corresponding author: ntsimanonofo@gmail.com

## Introduction

Predictions of wetland vegetation succession following changes in flooding regime require understanding of patterns and processes that characterize wetland ecosystems of semi-arid savannas. Such predictions are important for decision making under different water management options. Wetlands provide several irreplaceable ecosystem services that are intricately linked to changes in flooding regime. In the Okavango Delta (OD), few studies have quantitatively and qualitatively determined relationships between wetland vegetation communities and hydrological data. These studies were limited to the western and central parts of the Delta. This study aimed to investigate the influence of flooding on the herbaceous vegetation along the eastern peripheral Gomoti distributary.

## Study Area

The Okavango Delta is a seasonally flood pulsed system. The main source of water for the Delta is the Okavango River (Figure 1) which rises from the Angolan highlands. Mean annual floods are estimated at about 10,000Mm$^3$(Dinçer et al. 1987) with a coefficient of variation of 23% (SMEC 1989). Rainfall occurs between November-March, with annual mean falls of 500mm (Dinçer et al. 1987) and a coefficient of variation of 37% (Parida & Moalafi 2008).

## Methods

Stratified random sampling was done on a flood frequency map (Wolski & Murray-Hudson 2006). A minimum of 18 plots (10mX10m) per stratum (4) were surveyed for species composition and cover in February-April, 2015 in an area of approximately 70km$^2$.

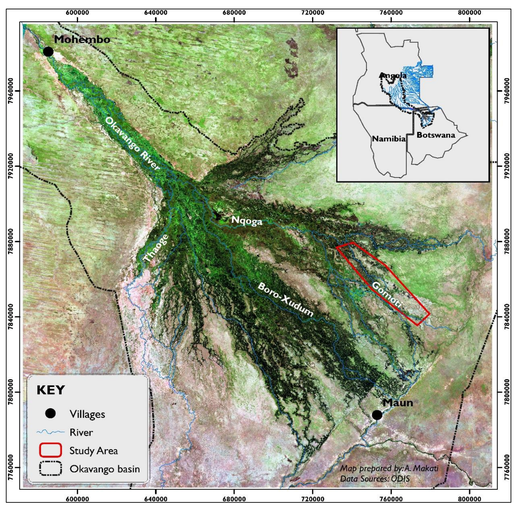


Fig. 1: Map of the Okavango Delta showing the study area

## Results

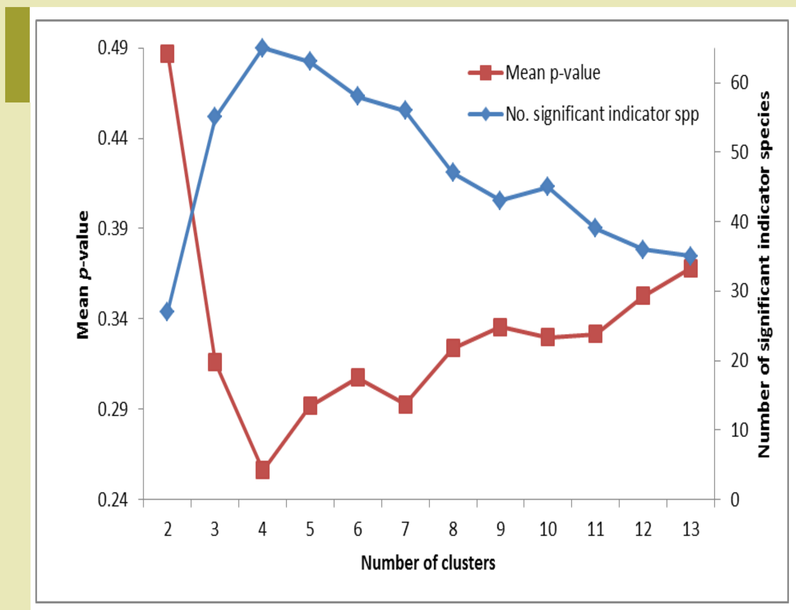


Fig. 2: Determination of ecologically meaningful number of clusters/communities

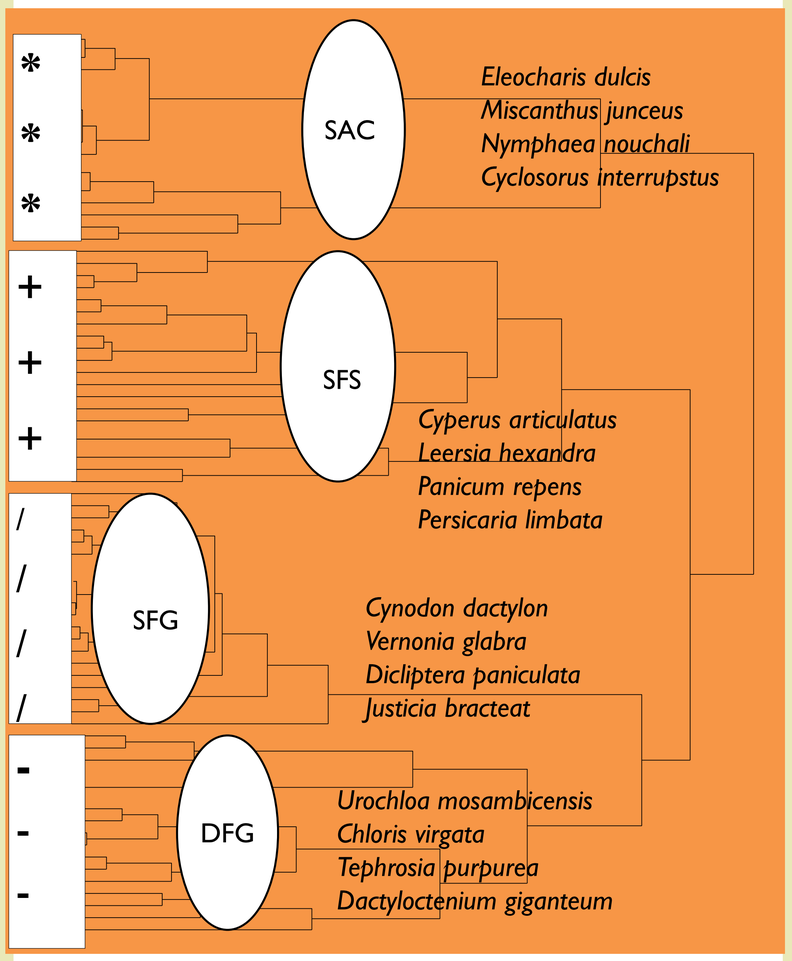


Fig. 3:Dendrogram of plots clustered by species (flexible β linkage, β= -0.25,Sorensen distance),from indicator species analysis.

## Results

- Testing the hypothesis of no difference between the groups

**Answer:**

MRPP analysis of the four group division: $p < .05$

Pairwise comparisons of the clusters: All $p$ – *values* <.001

Fig.6: Field work

## Results

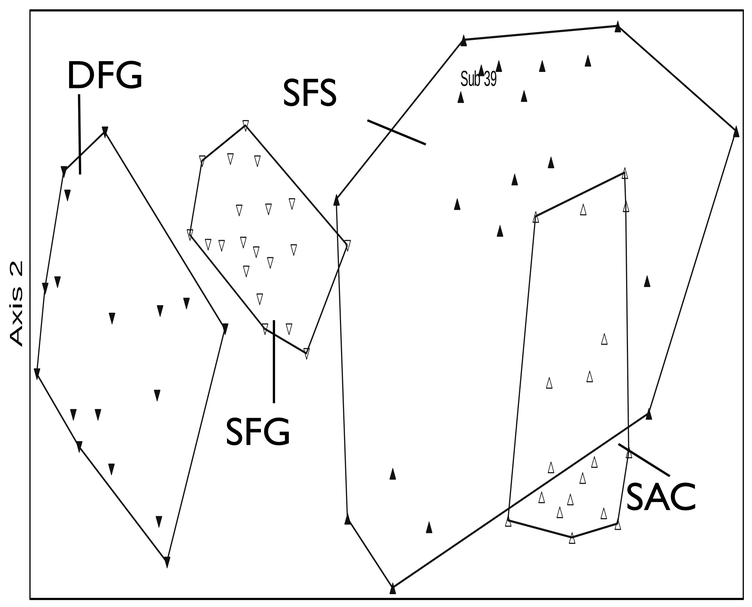


Fig. 4: NMS ordination of plots by species

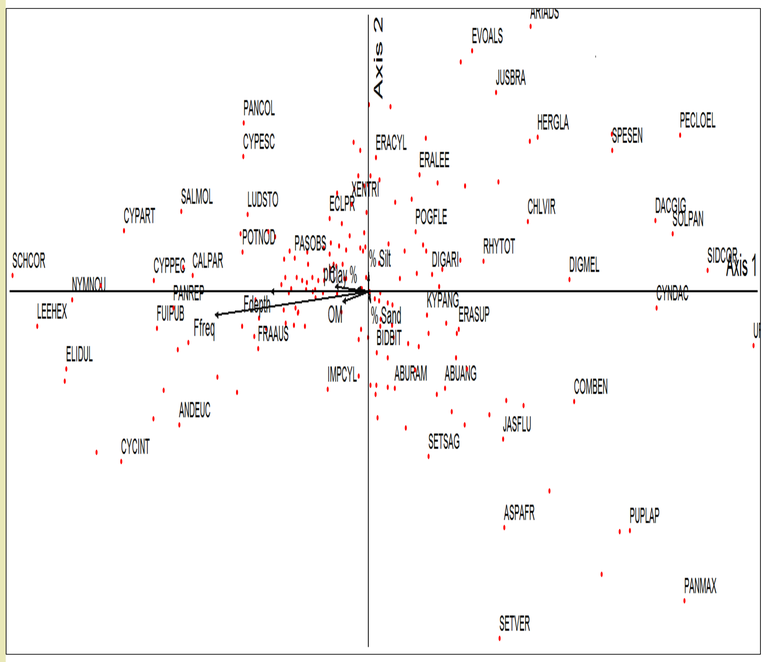


Fig. 5: NMS biplot of species along the Gomoti channel between February-April

## Conclusions

There were four main herbaceous vegetation communities along the Gomoti. In order of increasing flooding frequency; Dry floodplain grasslands (DFG), Seasonally flooded grasslands (SFG), Seasonally flooded sedgelands (SFS), and Seasonal aquatic communities (SAC). Changes in flooding frequencies can be used to predict the direction of vegetation succession. Major water resource developments upstream of the OD may result in an increase of dryland vegetation at the expense of more productive critical dry season (wetland) forage in the Okavango Delta.

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