

CHAPTER 6

General discussion and conclusion

The study successfully addressed the general objectives and the hypothesis listed in section 1.2 and 1.3 of chapter 1 respectively. Hypothesis 1 which stipulated that vegetation zonation in the seasonal floodplains is due to variation in elevation which influence extent and duration of flooding was found to be true. Hypothesis 2 which stipulated that vegetation zonation may be co-determined by soil water regimes and variation in soil chemical and physical properties, or a combination of both was also found to be true. This was supported by a successful ordination of floristic data using DECORANA (Hill, 1979b) which showed clear gradients illustrating variation in elevation, soil moisture, and soil chemical characteristics. The results of ordinations indicate a floristic relationship amongst the vegetation communities and emphasise the relation between environmental gradients and vegetation units.

However, the interaction of environmental factors and vegetation distribution may not be that obvious. The most obvious environmental gradient like elevation and soil moisture may not necessarily be the most important. It must be noted that environmental factors are manifested at different levels land (Haore, 1997). For example an environmental factor such as elevation and rainfall can govern vegetation at subcontinental scale as well as at local scale. However, at local scale aspect and slope, terrain, soil moisture and chemical biotic and abiotic factors play a major role, while overall precipitation and elevation play a lesser role (Haore, 1997). In local cases like the Okavango Delta seasonal floodplains elevation may be as important as it is at subcontinental.

The vegetation of the study area is relatively heterogeneous. Classification obtained by TWINSPLAN (Hill, 1979a) and refined by Braun-Blanquet procedures resulted in vegetation units which are easily distinguishable in the study area. Knowing the differences and similarities of vegetation communities is important for designing management plans for systems such as the Okavango Delta. Therefore a detailed description of the floodplain vegetation communities given in chapter 3 is essential in understanding how different

communities are likely to respond to disturbance such as fire, drought and overgrazing. Due to the corresponding results obtained from TWINSpan (Hill, 1979a) and the Braun-Blanquet analyses of total floristic data sets, TWINSpan may be useful as well as an extremely good first approximation to create a basic classification which may be refined by the application of the Braun-Blanquet procedures (Bredenkamp *et al.*, 1991).

Analysis of soil chemical properties indicated that in most cases there are significant differences in soil mineral contents amongst different communities. Soil mineral content also vary with season. Knowledge and understanding of the relationship between soil and vegetation provides basic foundations in conservation and management of vegetation, particularly in that they are interdependent in so far that destruction of one leads to the destruction of the other. Seasonal flooding seemed to have an influence on the contents of mineral nutrients in the soil, thus further substantiating the fact that seasonal flooding is the driving force of ecosystem functioning in the floodplains of the Okavango Delta and other similar ecosystems.

Hypothesis 3 which stipulated that utilisation of grazing resources in the floodplains are temporality and spatially variable due to variation between vegetation zones in availability and quality was also found to be positive. Plant species vary widely in their nutritional value as well as their utilisation by herbivores. However, no single combination of chemical composition or nutritional value of the plant species was found to be responsible for determining selection of plant species by herbivores. Its common practice when assessing veld condition to assign species to palatable and unpalatable categories. Palatability assessments are usually based on subjective judgement by experienced observers. It can therefore be concluded that species which are heavily utilised are more palatable than those which are not heavily utilised. The manner in which herbivores select their forage is fairly complex. Although factors such as digestibility and crude proteins are known to be of critical importance in determining selectivity, their influence is not always very clear.

Abstract

Grazing pressure on individual species was determined. Such information is very important because gives it a good picture of the relative importance of local species to the local wildlife population. Grazing pressure on individual species varies over time. Some species are heavily grazed only during dry periods when wet area species are limited. This shows that selectivity at times is a function of availability rather than quality. For example, *Sporobolus spicatus* is among the least digestible species, but heavily grazed during dry periods, when most of the palatable species are not available.

4. Great Heart and Lake Park for helping me with physiological studies

With the ever growing pressure to utilise water from the Okavango river and the Okavango Delta, as well as the apparent decline in inflow, the future of the Okavango Delta, and the flora and fauna it supports is bleak. It is therefore critical that intensive scientific research programmes be embarked upon to generate information useful to policy makers, landuse planners, natural resource managers and researchers, particularly when drawing management plans and environmental impact assessments.

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