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The uses, local perceptions and ecological status of 16 woody species of Gadumire Sub-county, Uganda

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Abstract Populations of naturally growing woody species valued for their contribution to human livelihoods are threatened with extinction. Most at risk are those existing in human inhabited areas outside protected areas that are subjected to high population pressure and to a variety of land use demands. The sustainable utilization of these plants requires as a first step knowledge, including, their ecology and an understanding of the peoples attitudes to conservation. This study was conducted to generate data that would contribute to the management for conservation and sustainable use of woody resources. The study objectives were to document local knowledge covering the uses, status, threats, habitats and management solutions of woody species; determine the abundances, distribution and population structure of 16 woody species, and assess the conservation status of the selected woody species. The study was carried out in Gadumire Sub-county, Uganda using both an ethnobotanical approach and quantitative ecological methods. The species are multipurpose and are exploited to satisfy different subsistence needs. They had population densities ranging between 3.6 and 2630 individuals ha^{-1}, and distributions ranging between 0.3 and 39.5%. The species *Acacia hockii, Albizia zygia, Acacia seyal, Markhamia lutea* and *Albizia coriaria* had a good conservation status. The remainder of the species appear threatened either because they had low densities, frequencies or less steep size class distribution (SCD) slopes. *Securidaca longipedunculata* Fres. was not encountered at all in the study plots. Community perceptions collaborated the measured population dynamics. The major threats believed to be impacting the species by the community are the growing human population, expanding crop agriculture, poor harvesting methods and over-exploitation of the species.

Keywords Ethnobotany · Harvesting patterns · Population structure · Savanna woodland

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Introduction

Many households in tropical areas depend on wild plant parts or products gathered from wild management systems. The rural poor are especially dependant on wild plants for their subsistence. They harvest products such as firewood, construction material, food, fodder and browse fodder for their wellbeing (Walter 2001; Tabuti et al. 2003a, b, c; Tabuti et al. 2004; Ticktin 2004). Furthermore, activities related to wild plants contribute to household incomes by providing employment opportunities and cash incomes from the sale of some of the products (Shackleton et al. 1998; Walter 2001). Livelihoods dependant on gathered plants or their parts are threatened by the widely acknowledged on-going loss of plant diversity. This is especially true of wild plants found in human inhabited areas outside protected areas that are subject to high population pressure and various land use demands. These areas experience habitat degradation coming as a consequence of overgrazing, increasing crop agriculture or logging (Walter 2001; Dalle et al. 2002; National Environment Management Authority 2002; Kaimowitz et al. 2004). Furthermore plants outside protected areas are routinely over-exploited. Woody plants are especially vulnerable to human related impacts because they are slow growing (Cunningham 1993; Aumeeruddy 1994; Schippmann et al. 2002).

In order to conserve vulnerable plants for sustainable utilization it is necessary to have information on aspects such as the effect of human activities on the populations of the target plant species, their ecology (Peters 1999; Dalle et al. 2002), and local harvesting methods, existing threats and attitudes to plants conservation. The measurement of ecological status is straightforward (Hall and Bawa 1993; Lykke 1998) however the investigation of human influence on plants is complicated by the need to have long-term monitoring data on population trends. There are few species for which such long-term data exists. In the absence of this information, population dynamics are commonly inferred from population structure data. Population structures are easy to assess from single survey size class frequency distributions (Hall and Bawa 1993; Cunningham 2001; Obiri et al. 2002). From this type of data, preliminary indications of how plant populations may be affected by extractive activities or other land-uses can be attained (Hall and Bawa 1993; Lykke 1998; Peters 1999; Obiri et al. 2002; Dalle et al. 2002).

This study was conducted in Gadumire Sub-county with the specific objectives of: (1) documenting local knowledge covering the uses, status, threats, habitats and management solutions of woody species; (2) measurement of the abundances, distribution and population structure of selected woody species, and (3) assessing the conservation status of selected woody species. Some uses, but not all, of the study species were documented in an earlier study (Tabuti et al. 2003a, b, c; Tabuti et al. 2004); this current study concluded the inventory of uses. It is expected that this information will help clarify decisions for management of woody plant resources for sustainable use.

Study area

Gadumire Sub-county is one of the five sub-counties that together make up Bulamogi County (The County was upgraded to district status in 2005). It is located 200 km north-east of Kampala, the capital city of Uganda, 33°30′ – 33°35′ E and