

## Traditional nomadic tending of trees in the Red Sea Hills



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### ABSTRACT

There are recurring questions about the ecological sustainability of indigenous resource management and what traditional ecological knowledge and rationale underlie such practices. Pastoral nomads from the Hadandawa, Amar Ar, Bishaari, Ababda and Ma'aza tribes in the Red Sea Hills of Egypt and Sudan have relied on drought persistent *Acacia tortilis* trees for millennia. Presently, political, social and economic factors impose changes in traditional livelihoods and land use. Interviews and long-term field observations have documented traditional practices and underlying ecological knowledge about the use and tending of *A. tortilis* during all its growth-stages. A variety of local pruning practices, previously considered destructive by many outsiders, conform to good practice described in modern literature. Traditional "gardening" of trees protects, strengthens and renews these essential resources – and shapes this (hyper-) arid cultural landscape.

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### 1. Introduction

During the droughts of the 70s and 80s nomads and pastoralists in African drylands were accused of overexploiting and misusing natural resources in a fragile environment (Lamprey, 1983). Their "inappropriate" land use allegedly caused desertification (Davis, 2005; Herrmann and Hutchinson, 2005). Subsequently a better understanding of human influence and dryland ecology has emerged (Homewood and Randall, 2008; Niamir-Fuller, 1999; Vetter, 2005; Westoby et al., 1989). Drylands have been acknowledged to be *cultural landscapes* or *human-environment systems*, both concepts recognizing the importance of human influence and the long-term accumulated ecological

knowledge inherent in land-use systems (Andersen, 2012; Krzywinski and Pierce, 2001; Reynolds et al., 2007). It has also been recognized that researchers need to consider Traditional Ecological Knowledge (TEK) as a potentially important source of scientific information (Berkes, 2008; Davis, 2005; Reynolds et al., 2007).

For millennia nomads have adapted to climatic variability in drylands, with mobility as their key to resources and survival. In arid and hyper-arid areas of the Eastern Sahara, including the Red Sea Hills (RSH), pastoral nomadism has been a wide-spread, well-adapted and sustainable land-use system of great antiquity (diLernia, 2002; Kuper and Kropelin, 2006; Millennium Ecosystem Assessment, 2005). Pastoral nomads have probably moved about there since regional desiccation started around 5500 BP (deMenocal et al., 2000). Inasmuch as available resources have been scarce, their continued use over millennia must have been sustainable (Andersen, 2012). Indigenous populations have had to develop movement patterns, conservation rules and sets of management strategies, including complex rules of land and resource ownership, based upon a rational ecological understanding, and this TEK had to be preserved in collective memory (Berkes, 2008).

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The nomadism practiced in the RSH is based on tradition and territoriality. The nomads' mobility is circumscribed by socially defined rights of access and use that are centered on home areas and extended to more distant and broadly defined areas in response to variations in vegetation and availability of water. The traditions governing rights of use are transmitted orally and by example and exercised within the circles of family, section and tribe, where vital TEK can be seen to underpin the pastoral lifestyle.

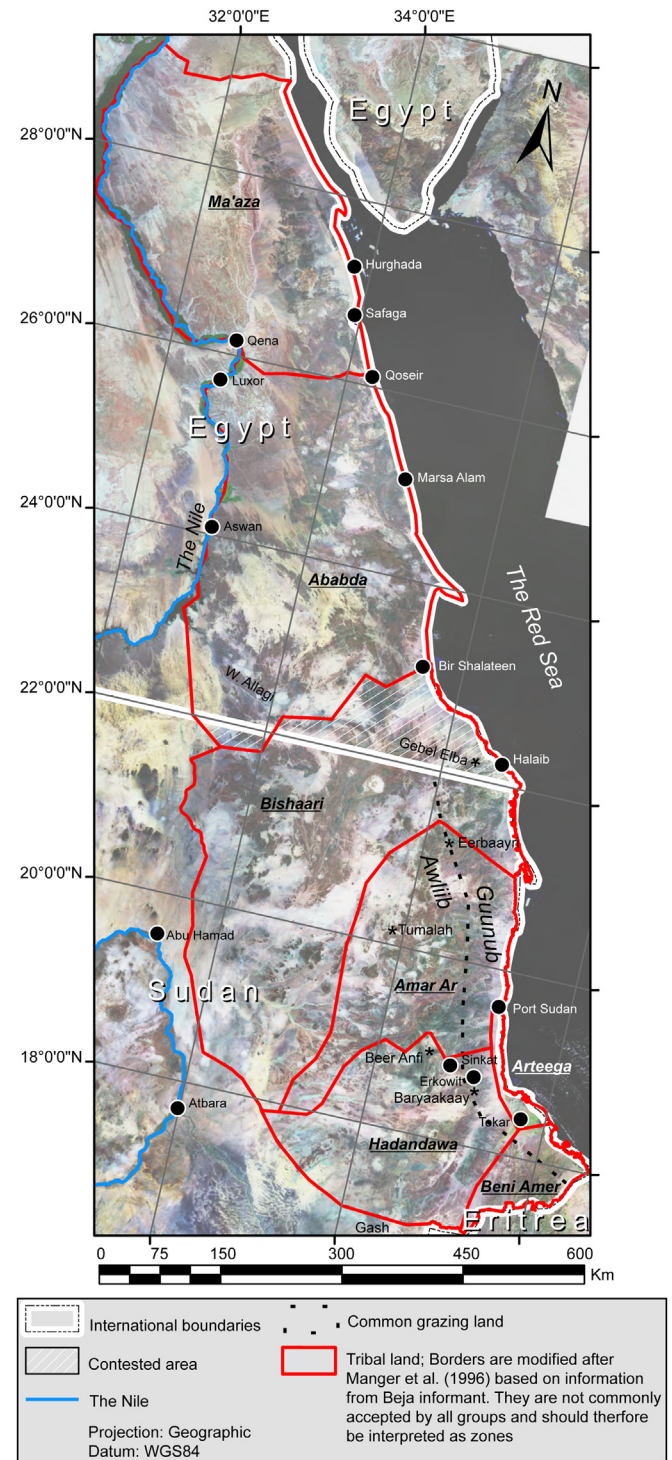
TEK in ecosystems governed by slow dynamics, such as are found in arid lands, is of particular scientific interest. Important processes such as regeneration of vegetation normally happen on a decadal scale or even more slowly (Wiegand et al., 2004) and are best observed by people dependent upon them and resident where they occur. They become embedded in indigenous land use management systems and are transferred from generation to generation. However, while ecologically sound management systems, involving both ephemeral and arboreal vegetation, exist among several nomadic groups in North Africa and the Middle East, few are known in detail to the scientific community (Andersen, 2012; Davis, 2005; Hobbs, 1989, 2006).

Among pastoralists moving about in drylands herbs and grasses are a highly valued fodder resource, but limited in both time and space. Trees, on the other hand, are long-lived, drought persistent and green most of the year and thus constitute a vital resource, often aptly referred to as 'multipurpose trees' (Andersen, 2012). Here our focus is on the use and tending of trees among pastoral nomadic tribes in the RSH of Egypt and Sudan, with special reference to the *Acacia tortilis* (Forssk.) Hayne — a species widespread across African and Middle Eastern drylands and of great importance to many pastoral societies (Andersen, 2012; Hobbs, 1989; Lancaster and Lancaster, 1999; Stave et al., 2001). To our knowledge the nomadic tending of trees in the RSH has yet to be described in sufficient detail.

Presently political, social and economic globalization is accelerating in the North African drylands, eliciting changes in society, livelihood and land use (Millennium Ecosystem Assessment, 2005). As indigenous inhabitants depart and assimilate to a modern lifestyle, their land use and tending practices cease (Hobbs, 2007). In particular, the heritage of information that has maintained the millennia old cultural landscape of the RSH risks being lost in only a few generations. In a dryland region where trees recently have been reported to have high mortality and low recruitment (Andersen and Krzywinski, 2007; Shrestha et al., 2003), documenting the ecological knowledge underlying their indigenous management (Andersen, 2012) can be of vital importance for safeguarding these pastoral resources for future generations. Our aim is to record such knowledge while there are still informants who can tell us in their own terms how they understand and carry out their activities.

## 2. The Red Sea Hills and their inhabitants

The mountains of the RSH in Egypt and Sudan and the deserts adjoining them are a part of the Sahara desert east of the Nile (Fig. 1). There is a regional south to north moisture gradient, ranging from arid in its southern part (around 100 mm mean annual precipitation) to hyper-arid in its northern and central parts (around 10 mm). Despite extremely high spatio-temporal variability in rainfall there is an overall seasonal pattern, with winter rains in the north and both winter and monsoonal summer rain in the south. The whole region has hot summers (mean temperature of hottest month between 20 and 30 °C) and mild winters (mean of coldest month 10–20 °C), unless in the Guunub (Fig. 1) where the winter is warm (mean of coldest month 20–30 °C; Ayyad and Ghabbour, 1985). Phytogeographically the area belongs to the Sahara–Arabian region in the north and the Sahelian in the south,



**Fig. 1. The Red Sea Hills study area and tribal territories.** The Tigre speaking Beni Amer and the Arteega are not included in this study. Among the Beja tribes in Sudan the coastal land receiving winter rain is called the *Guunub*, while the hills and inland desert to the west of the mountains receiving summer or autumn rain are called the *Awliib*. This distinction is important for the seasonal movement patterns. The *Awliib* is further divided into *Eetbay* (the area north of Tumulah to Bir Shalateen on the coast and Wadi Allagi in the west, receiving rains in September and October) and *Tamarab* (the area west of the hills south of Tumulah up to the Atbara River, receiving rains in July and August). Mist and dewfall, generally occur at higher altitudes in the whole RSH and are not confined only to the well-known mist oases at Gebel Elba and Erkowit.

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