BOOK REVIEW

Atlas of the Potential Vegetation of Ethiopia. Ib Friis, Sebsebe Demissew & Paulo van Breugel. Copenhagen: The Royal Danish Academy of Sciences and Letters in *Biologiske Skrifter* 58. 2010. 307 pp. including 29 colour map plates (1:2 000 000). ISSN 0366 3612, ISBN 97887 7304 347 9. 400 DKK (approx. £46) paperback.
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Vegetation maps enable sound spatial understanding of the botany and ecology of a country or region. The Horn of Africa has been blessed with the early publication of a 1:5 000 000 vegetation map (Pichi-Sermolli, 1957), which has helped orient researchers for decades. This map also provided a regional base for the 1:5 000 000 *Vegetation Map of Africa* (White, 1983), which has been widely used for conservation planning (e.g. Burgess *et al.*, 2004). The newly published *Atlas* is an off-shoot of the recently completed *Flora of Ethiopia and Eritrea* and provides the next step for Ethiopian vegetation science.

The 1:2 000 000 vegetation map is depicted in 29 colour plates at the back of the *Atlas*. As the title suggests, 19 separate vegetation types characterise 'potential' vegetation, i.e. the vegetation that one would have expected to see had it not been for major human interference (see also Pichi-Sermolli (1957) and White (1983)). On the map only 14 out of the 19 different vegetation units are distinguished, as unfortunately the four subtypes of dry Afromontane forest and grassland and the two subtypes of moist Afromontane evergreen forest could not be spatially recognised (see also methodology below). Riverine vegetation could not be mapped because of its narrow size.

The text of the *Atlas* begins by presenting the physical environment of Ethiopia, followed by a history of vegetation maps in the country. The map units of Pichi-Sermolli (1957) and White (1983) are compared in detail to the *Atlas* in two interesting appendices. The core of the text centres on descriptions of the 19 vegetation types. Although these narratives are enriched by a wonderful set of plates illustrating each mapping unit, a useful inclusion would have been a description of all the plants they depict. Also, one set of wrong plate descriptions (pp. 98–102) slipped through unnoticed. The text contains a lot of interesting information on vegetation distribution unfortunately not always distinguished on the map, a drawback of the focus on potential vegetation; for example, 'East of Mekele, there are remnants of a *Juniperus-Olea* forest … and just below the forest a rather dense woodland of *Dracaena ombet*' (p. 89). A highlight of the *Atlas* is Appendix 3, in which woody plants of the *Flora of Ethiopia and Eritrea* are assigned to vegetation types, although I would have liked to have seen clearer references to field data or relevant publications.

I was particularly interested to revisit the long-known similarities between Ethiopia and the Arabian side of the Red Sea (Schweinfurth, 1891). As with the map of Yemen by Scholte *et al.* (1991), the *Atlas* uses an 1800 m altitude limit to distinguish lowland

from montane vegetation communities, raising the question of which ecological reasons determine this apparent constant altitude. Also, the limits of 3000–3200 m (Ericaceous belt) and > 3200 m (Afroalpine belt) are generally consistent. Sometimes, however, slightly different figures are used, such as '*Acacia-Commiphora* woodland occurring between 900–1900 m' (p. 252), and unfortunately these limits are not really discussed in the text, with only a few cases justified with data or references. I suspect that the mapping units have been extrapolated from an unknown number of field observations through the digital elevation model on which the mapping was based.

I question the methodology of the *Atlas* in terms of its mapping of vegetation units, as the scale of the map would have allowed a physiographic approach based on so-called land units (Zonneveld, 1989). Especially in Ethiopia with its enormous variation in altitude and geology, land units, easy to map, would have allowed the possibility of linking directly with vegetation types, potential but also actual, as well as providing (semi-quantitative) information on their cover. I also felt that some physiognomic classification criteria should have been included, which would make it easier to judge the difference between, amongst others, 'bushland', 'bushland proper', and 'woodland' or 'wooded grassland'. Physiognomic classifications, as proposed by Pratt & Gwynne (1977) and further developed for sparsely vegetated Arabia (Scholte, 2000), could have provided more clarity. Although the authors possess impressive fieldwork experience, it is unfortunate that the *Atlas* refers to only a few detailed vegetation studies in Ethiopia and none of the excellent work available from neighbouring countries, such as Djibouti (Audru *et al.*, 1987).

I would like to conclude by directly quoting the authors: 'The map plates in this work will of course not be the final vegetation map of Ethiopia, but we believe the suggestions made here, based on field observations, reflect a better and more complete picture than any of the previously published maps'. I would strongly recommend the *Atlas* for botanists and ecologists working in the Horn of Africa and suggest using it to update conservation planning tools derived from White's (1983) now outdated *Vegetation Map of Africa*.

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