Using Bioinformatics in Managing the threatened Trees of Africa

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Introduction

Over 1000 tree species in Africa are at various levels of threat (WMWC, 1998). Information concerning these species is rather fragmentary. Data on Red List categorization is often unavailable for research, policy and management purposes. Lack of structured information system concerning these plants has made their management for sustainable development difficult. Data deficiency on African flora generally arises from lack of research databases and data sharing network. Therefore, in order to utilize African trees for sustainable development, there is need to assemble and organize the existing array of information from basic biodiversity research, applied biodiversity research, remote sensing, ecosystem studies and biodiversity inventories in well structured, computerized databases, with a view to creating African web of biodiversity information and to stimulate a new generation of integrative research on the continent.

Materials and Method

Threatened tree species in ten African countries were evaluated for availability of biodiversity information in whatever forms. The species considered for the purpose of this study are those recorded in *The World List of Threatened Trees* (WCMC, 1998), from Cameroun, Chad, Botswana, Benin Republic, Egypt, Gabon, Ghana, Kenya, Nigeria and Papua New Guinea. Majority of these countries represents biodiversity hotspots in Africa, wholly or partially embedded in the Guineo-Congolian forest belt.
The DELTA system (DEsription Language for Taxonomy), the standardized format for coding taxonomic descriptions (Partridge *et al*., 1986) was used for the database on selected 50 threatened tree species. The attributes were separated into categories as: unordered multistate (UM), ordered multistate (OM), integer numeric (IN), real

numeric (RN), and text (TE) e.g. CITES status, references, local uses, common names.

Results

The ten countries share 647 threatened tree species in 245 families among them, with Kenya accounting for 23.8% while New Papua Guinea, Ghana, Gabon and Nigeria account for 18.9%, 18.1%, 13.6%, and 7.6%, respectively. Chad, Botswana, Benin and Egypt seem not to face as much threat as found in their other countries. Endemism is characteristic of the African trees but varies from place to place, being highest in Papua New Guinea. There exists in the ten African countries, a whole range of unstructured and unlinked information on biodiversity of threatened tree species Available record showed that less than 20% of all the threatened trees have been formally evaluated for Red List categorization.
Databases on 50 of the threatened tree species are available on CD and provided only by request.

Conclusion

There is a great deal of opportunity to harness the present array of unstructured web of information on African trees through the application of bioinformatics as a tool for integrating and connecting data from a variety of sources. It can provide a rapid, flexible and integrative method of combining data from an array of data sets, for a robust checklist of threatened trees of Africa, the absence of which has hindered collaborative research efforts on the continent to the present day. Bioinformatics promises also, to reduce the existing crippling gap in research findings and information dissemination on threatened trees within Africa and between Africa and the global community for sustainable development.

References

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