

Forestry germplasm in Namibia

P. Graz*

1. Introduction

The Head Quarters of the Directorate of Forestry was instated during the last months of 1990, while forestry is represented in Ondangwa, Rundu, Katima Mulilo, Grootfontein, Mariental and Windhoek. Two further offices are to be opened in Gobabis and Keetmanshoop respectively.

Of these, all the northern offices were in existence before the independence of Namibia, but were suffering, as they still are, from severe shortages of manpower. Therefore, it has been, and still is, difficult for forestry officers to concentrate on fields relating to germplasm conservation.

This does, however, not mean that nothing is being done, since foresters have, for instance, collected the seed of indigenous species from the forests, to be used in the nurseries. This practice is to be continued, although it is understood that germplasm conservation entails more than raising of indigenous trees from seed collected within the country.

In view of forestry's limited involvement in the past, it may therefore, be more appropriate to state the interest that forestry has in this field, and what expectations there are.

2. Conservation and Production

Forestry activities can roughly be divided into two categories; namely conservation and production forestry. These two fields may often be seen to have conflicting interests, but this is not necessarily the case. Production forestry may serve conservation in that it takes the utilization pressure off the natural resources, giving these resources time to recover, or preserving them in a relatively undisturbed state.

* Directorate of Forestry, P/Bag 13184, Windhoek, Namibia

Conservation and production forestry have, nevertheless, two separate classes of requirements as far as the fields of germplasm conservation are concerned. While conservation forestry is interested in the protection of the genetic resource, production forestry is more concerned with genetic tree improvement to achieve greater yields.

2.1 Conservation of Germplasm

The conservation of germplasm should not be viewed in isolation from overall conservation. The evolution of species and ecotypes suggests that the genetic make-up of organisms is closely linked to the environment and micro-environment respectively. This suggests that changes in the environment, such as changes in micro-climate, may alter the favourableness of an area for the survival of local species. The north-eastern parts of Owambo have for instance been described as wooded, in the past. Now, however, desertification is taking its toll, and it is doubtful whether the indigenous tree species will continue to survive there now, without major silvicultural inputs.

Viewing the conservation of the genetic resource in isolation will limit the value of such conservation to botanical or economic interest, and not ecological as such. Germplasm conservation in a seed bank, or any other artificial form, serves as a backup for the genetic resource, and as such must be seen as a sub-system to environmental conservation. It is clear that all species must be conserved, not only those which have economic or aesthetic values. Should the need arise, material must be available to initiate artificial succession in areas where the ecology has been destroyed, since it is unlikely that a climax vegetation can be re-established within economic reason.

2.2 Tree improvement

Tree improvement for production forestry has in the past been limited to seed selection by the staff of the forestry nurseries. Such selection involves the collection of seed from trees with certain desirable characteristics. These seeds were, however, mostly utilized for the production of plants for sale, since the facilities at the nurseries are not equipped to deal with long-term storage.

While seed selection prevents contamination of the genetic resource, it is only the first phase in tree improvement. Further steps would involve tree breeding, through controlled pollination, hybridization and cloning. These developments may often require genetic material from non-indigenous sources.

During tree improvement through breeding, it may happen that some traits are lost which may prove to be desirable at a later stage. It is then necessary to introduce these traits back into the breeding programme. Although they are often related to economic values, such as fibre length for increased strength of timber, such traits may also be related to ecological factors such as susceptibility to damage by insects or

fungi. The latter are related to environmental conditions, or to silvicultural considerations which produced a changed micro-environment (as do monocultures).

3. Conclusion

In conclusion it must be stated, that the value of germplasm conservation must not be underestimated, but must be seen in the context of environmental conservation as a whole. Furthermore, this sub-system, or conservation strategy, ultimately represents a backup for the vegetation component of ecological systems, and may allow the recreation of ecological sub-systems through artificial succession.

Lastly, germplasm conservation provides an invaluable resource for the improvement of trees, or any other plant for that matter, which plant breeders may draw upon to develop high-yield crops for the benefit of the people and, indirectly, the environment.
