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Implications of utilization of non-timber forest products in mountain ecosystems

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Control of Tanzanian protected forests is so far by use of regulatory policy instruments. The strategy does not adequately identify nor protect Non-Timber Forest Products (NTFPs) that are used by the local communities living close to the forests. Consequently, the local communities continue to use protected forests 'illegally'. Examination of different NTFPs extracted by the local communities from montane forests and their effects on species diversity, composition and forest structure was carried out through interviews and observations. Uzungwa Scarp and Njerera Forest Reserves served as a case study. The study used 100-0.1 ha plots placed in the proximal (disturbed) and distal (undisturbed) forest sites in equal numbers. A total of 236 species represented by 7994 individual trees in 56 families, were recorded. Species diversity (H') ranged from 2.139 to 3.609 in the proximal sites and from 2.462 to 3.045 in the distal sites. Except for Mbawi and Uhafiwa areas, proximal sites recorded significantly higher species diversity than distal sites (t-test, $p < 0.05$). Also proximal sites consistently recorded lower total basal area (Mean $21.70 \pm 19.39 \text{ m ha}^{-1}$) than the distal sites (Mean $40.84 \pm 17.87 \text{ m ha}^{-1}$). In addition, a significant difference in DBH size-class distribution was observed between the two contrasting sites (t-test, $p < 0.05$); larger DBH size classes being confined to distal sites. Colonizing species such as *Macaranga kilimandscharica* dominated proximal sites, an indication that extraction of NTFPs favour their establishment. Classification of vegetation using TWINSpan and Clustering methods resulted into four groups, a reflection of the topographical and geographical differences inherent of the area. Diameter at Breast Height size-class distribution of some canopy trees did not produce the expected reversed J-shaped curve even for trees recorded from distal sites, perhaps factors other than human disturbance are in operation, hence a need for further research. Eight types of NTFPs were identified: building poles, fuelwood, medicinal plants, etc, most of the products being extracted from protected forests. The density of commonly extracted species was approximately three times higher in the distal than proximal sites. The northern USFR is richer in NTFPs than the southern part. Use of NTFPs extracted from the protected forests by the local communities as revealed by this study show failure of the regulatory policy instruments in protecting forest reserves. The extraction of NTFPs threaten the stability of biodiversity. Intervention on current debarking of medicinal trees is necessary because targeted trees are killed

in the process. The local communities should be assisted in establishing woodlots for both exotic and indigenous trees to satisfy their needs. There is also a need to involve the local communities in managing the forests and sharing the benefits. Simultaneously, a balance should be maintained between the local communities interests in these forests and the government's interest in protecting biodiversity and water catchment areas.