Establishment of TaCEA botanical garden to support propagation and restoration of TaCEA

**Introduction**

Aloes are among the plant species that receive limited conservation attention despite their high ecological and medicinal value. Globally, they are increasingly threatened by overharvesting for trade and habitat destruction. The international trade of Aloe species is regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). In Tanzania, critically endangered Aloe species (TaCEAs) face insufficient conservation efforts and continue to decline due to inadequate conservation preparedness among practitioners. Consequently, habitat degradation from human activities and unsustainable collection for medicinal use and trade severely threaten their populations in the wild.

Ex-situ conservation through botanical gardens offers an alternative strategy to protect TaCEAs from local extinction. Aloe species occupy a wide range of habitats, including forests, rock surfaces, and cliff faces. However, in East Africa, one-third of Aloe species have restricted distributions and are classified as endangered (CITES 2003; Wabuyele et al. 2006). In Tanzania, there are about 46 Aloe taxa, of which 25 are endemic (Wabuyele et al. 2006) and 13 are threatened (Newton 2004). This project aimed to initiate and strengthen the protection and ex-situ conservation of TaCEAs by establishing a botanical garden at Mbeya University of Science and Technology (MUST). The garden represents a contribution to global efforts to conserve endangered plant species. It is expected to play a vital role in the ex-situ conservation and propagation of TaCEAs, support research and education, and provide nurseries for seedling production for future restoration in natural habitats. Ultimately, this garden is envisioned to safeguard Aloe species from local extinction while contributing to broader global conservation initiatives.

## Methods

The project was implemented in sites recognized by the IUCN and other studies as ecological hotspots for TaCEAs in Tanzania. These included Handeni District (5.4236° S, 38.0261° E) for *Aloe dorotheae* and Lushoto District (4.7987° S, 38.2902° E) for *Aloe flexilifolia* in Tanga Region. Field surveys were conducted in these two districts to collect seedlings and seeds for planting in the botanical garden. Due to the rarity of seeds, most propagation materials were seedlings. Fieldwork was conducted between May and August 2025, lasting approximately four months. Collected seedlings were initially planted in plastic trays and pots under shade to acclimatize before transplantation to the botanical garden. Because of their endangered status, only a limited number of seedlings (about 10–12 per species) were collected to ensure wild populations remained intact. Where available, a few mature individuals were also transplanted to strengthen ex-situ collections.

## Results and discussion

A total of 26 seedlings of *A. dorotheae* and 18 seedlings of *A. flexilifolia* were collected, some from rocky habitats. *A. flexilifolia* was identified at six locations within Lushoto District. Local communities reported noticeable declines in Aloe populations both in villages and the wild. Although this survey was restricted by limited time and funding, the findings highlight urgent conservation needs. Future surveys will expand coverage to assess more Aloe populations across Tanzania and strengthen ex-situ conservation efforts at MUST Botanical Garden.

Figure 1. Botanical garden where TaCEA seedlings will be transplanted

Figure 2. Growing *A. dorotheae* (left) and A. *flexilifolia* (right) in pots

Figure 3. TaCEA seedlings planted in plastic pots. These seedlings will be transplanted in the botanical garden

Figure 4. TaCEA seedlings planted in plastic trays. These seedlings will be transplanted in the botanical garden

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## References

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## Other field photos during surveys