

INTERACT-BIO DIALOGUE
THE ROLE OF LOCAL NURSERIES IN SUPPORTING NATIVE BIODIVERSITY
IN DAR ES SALAAM



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INTERACT-Bio
Integrated action on biodiversity



1. BACKGROUND

The City of Dar es Salaam is located in a globally important biodiversity hotspot, the 'Eastern Arc Mountains and East African Coastal Forest' hotspot. The Coastal Forest Hotspot runs along the Tanzanian and Kenyan coasts from the border with Somalia in the north, to that with Mozambique in the south. Of the original 30 000 km² extent, just 2 000 km² (i.e. 6.7%) of this hotspot remains. Biodiversity hotspots are areas of exceptional concentrations of endemic species (i.e. species found nowhere else in the world) that are simultaneously experiencing a high rate of habitat loss. For example, the African flame tree, *Fernandoa magnifica* and the tiny greenbul bird (*Phyllastrephus debilis*), are found only in the coastal forests of East Africa. Remnants of native coastal forests remain within Dar es Salaam City, pointing to an opportunity to restore the benefits provided by this unique natural heritage within an urban setting.

The City of Dar es Salaam has a long history of greening, but with a disproportionate emphasis on exotic tree species such as ashok (*Saraca* species) and neem trees (*Azadirachta indica*). As a result, the 2019 Thematic Atlas of Nature's Benefits to Dar es Salaam recommended: "Available knowledge on local biodiversity should be increased" and "Tree planting programmes should consider indigenous species as default options for new planting, especially those that are of special conservation significance, for example endemic or endangered." (p. 58). This recommendation sought to draw attention to the value Dar es Salaam's native plant heritage in support of local benefits such as urban cooling, air pollution reduction, medicinal and aesthetic value and also to enhance the integrity of a globally important biodiversity hotspot.

A study of Dar es Salaam's native biodiversity, conducted between February 2020 and April of 2021, included a field survey of 32 nurseries across Dar es Salaam. Given the need to promote planting of indigenous (or native) plants, the purpose of the survey was:

- To determine the extent to which nurseries cultivate and sell native plants, and;
- To explore the levels of awareness of native plant species among nursery owners.

The survey was commissioned by the [INTERACT-Bio project](#) and was conducted by staff and students of the Muhimbili University of Health and Allied Sciences.

This dialogue presents some of the opportunities and challenges in promoting awareness of, cultivation and sale of native plants to support urban biodiversity in Dar es Salaam.



2. DIALOGUE WITH NURSERIES

Dar es Salaam City boasts an impressive abundance of roadside nurseries across the city. Plant cultivation and sale is a way for local people to generate an income. These nurseries are also important because the Dar es Salaam City Council typically purchases plants from roadside nurseries for greening projects. The dialogue with nursery owners and managers was conducted in 2020 to gather information about the plant species available in local nurseries, the extent to which nurseries stock and sell native plant species and if so, where they source their indigenous stock from. The surveys were conducted by experienced botanists. A total of 32 roadside nurseries were surveyed across the different municipal districts of Dar es Salaam.

Across all nurseries, a total of 776 plants were observed, which reflected 165 species (both exotic and native species). Of the 165 species observed, 33 species were native to Tanzania. Therefore, 20%, or one fifth, of all the plant species observed in the nurseries were native and 80% were exotic species.

Some plant species were observed to be more abundant in the nurseries than others. In the exotic (i.e. non-native) species group, the most commonly observed species were:

- *Euphorbia milii*, common name: crown-of-thorns
- *Codiaeum variegatum*, common name: garden croton
- *Roystonea regia*, coming name: Florida royal palm
- *Dypsis lutescens*, common name: bamboo palm
- *Mangifera indica*, common name: mango

Among the native species seen in the nurseries, one of the most common tree species seen was *Trichilia emetica*, or Natal mahogany.

The reason for the relative species abundance in the roadside nurseries was not clarified in this study, for example whether exotic species seeds and/or seedlings are easier to access or perhaps easier to grow or whether customer demand for certain species might drive the choice and abundance of species cultivated and sold in these nurseries. Further insights are needed to understand and explain these observations.

The most popular growth form category was trees followed shrubs, herbs, small tree, climber/vine and lastly epiphytes (Epiphytes are plants that grow on other plants, such as ferns and orchids that grow on tree trunks).

Fourteen nursery owners were surveyed regarding the ownership of the nurseries. All were individually owned and there did not appear to be any nursery 'collectives'. The absence of collectives affects the city authority's ability to connect with the roadside nursery sector to for example discuss the potential to upscale the market for indigenous plants.

Nursery owners had varying years of experience with plant cultivation, ranging from 2 years to 30 years. Out of the 14 nursery owners interviewed, 5 could not differentiate between exotic and native species while the others were able to do this. This result suggests substantial awareness of and knowledge about native species among nursery owners and managers, although exotic species remain the most abundant in cultivation.



3. DIALOGUE WITH CITY OFFICIALS

A seminar was organised by the Muhimbili University of Health and Allied Sciences on 7 Oct 2021. Summaries of Dar es Salaam's biodiversity information were presented to a range of stakeholders, in particular representatives from Dar es Salaam's municipal districts. Issues and recommendations on best practice relevant to Dar es Salaam's indigenous natural heritage were raised:

- Kigamboni forest officer: We need to consider the inclusion of indigenous plants into building permit conditions and forest officers should verify after construction has been completed.
- Temeke forest officer: We need to advocate for forest conservation in the city but residents sometimes dislike these species because they harbour snakes and other unwelcome wildlife. However, these are misconceptions because these species are useful, emphasising the need to educate residents.
- Biodiversity expert: Native plants grow slower when they grow in their natural habitats because they are affected by fire, herbivores and drought. But when in cultivation, being watered, protected from fire, can grow as fast as exotics and growers should not be discouraged by the misconception that native plant species grow slower than exotic species.
- NGO to the municipal representatives: We need city guidelines and policies on tree planting: For example, many Dar es Salaam residents harvested herbal remedies during COVID.
- Ubungu official: We are already planting native trees in schools and as part of river rehabilitation projects to counteract erosion, but would like a more extensive list of species to plant.
- Politicians often select tree species. We need to find ways to portray the social and political advantages of native tree species.
- Temeke city planner: Dar es Salaam has a master plan but much of the land does not belong to city, but is owned by private individuals. Thus, if the city requires that a parcel of land should be set aside for tree planting, then those land owners will expect to be compensated. Private land owners need to be sensitised to the benefits of planting trees in their own land. This even applies to people who have informally moved onto and claimed land along river banks.
- The Road Act and other related acts have stipulations around trees and vegetation that might block road user visibility. Thus, sometimes big trees are not allowed in road areas. But the presentations today suggest useful plants for road corridors, for example shrubs and ornamental species which will not obscure visibility of drivers.



RECOMMENDATIONS

Cities are major drivers of biodiversity loss, but they also offer significant opportunities for action. Cities can demonstrate that acting for biodiversity in urban settings can generate significant benefits for urban societies. By focusing on enhancing nature, cities can address key underlying drivers of biodiversity loss by responding to the links between nature and climate change risk, by reducing pollution and changing patterns of consumption, and by generating connections with nature that instil values that support biodiversity.

Local stewards for biodiversity are vitally important. Increasing awareness of the importance of biodiversity and ecosystems, on how human actions impact biodiversity and how they can get involved and become stewards of biodiversity, can help alleviate some biodiversity and ecosystem loss. Cities need engaged stewards that can help redirect the impacts of urbanization into a positive change for people and the life-support natural systems that we depend upon.

Urban economies are essentially 'embedded' within nature. For example, two major issues for Dar es Salaam, namely urban heat and the need to stimulate tourism and local revenue generation, are tied into the city's ability to upscale urban cooling and tourism amenities such as urban parks, even at very small scales (e.g. pocket parks). Dar es Salaam is already known for its unique cuisine, markets, vibrant city life, birding tourism and beautiful beaches. If the city were to become more biodiversity savvy, tourists who would normally be transiting to other tourist destinations like Arusha or Zanzibar, would be encouraged to select Dar es Salaam as a major tourism destination. To achieve this, the conservation and wise use of the natural environment and sustaining ecosystems will require greater government support, partnerships with and greater private sector involvement, a rapid upscaling of sustainable businesses and green infrastructure, and new financial arrangements. Biodiversity and ecosystem services have economic value which, if internalized by economic agents, has the potential to attract private finance. Evidence suggests that private sector investment in biodiversity and ecosystems is not only affordable and beneficial but can be highly profitable.

If there is demand for native plants, nursery owners are likely to shift their products to service the demand. Stimulating a market for native plant species in Dar es Salaam will require education, publicity and projects to plant native plants. Workshops and materials are needed to share information on native plants with nursery owners, landscaping companies, municipal planners, land owners, gardeners and educators.

Partnerships will be important for supporting local efforts. For example, NGO projects such as Okoa Mimea Ya Asili by Culture & Development East Africa can facilitate the promotion of native plants and help can be enlisted from the Dar es Salaam Gardening Club. The demand for native species does seem to be on the increase. In a recent project, the World Bank in Dar es Salaam requested thousands of native seedlings, but they were able to source only a few hundred from local nurseries.

Apart from roadside nurseries, other, specialised indigenous nurseries and botanical gardens can be used to test and demonstrate feasibility to propagate and raise interest in native plant species and to test whether such species can be successfully cultivated and be an economically sustainable commodity.

Sourcing seeds or seedlings of indigenous plants without harming wild populations can be a challenge. In some cases, wild plant populations can have poor germination rates and experience high rates of seedling predation. It is therefore important to ensure the sustainable harvesting of seedlings from such populations. Knowledge of the ecology and reproductive biology of species of interest is necessary as well as their horticultural potential. This calls for in-country expertise such as that of the Tanzania Forest Service's Directorate of Tree Seed Production, the Sokoine University of Agriculture, and NGOs such as the Tanzania Forest Conservation Group and Reforest Africa.



4. ALIGNMENT WITH LOCAL AND GLOBAL POLICIES AND

This dialogue shows significant potential to promote native species for urban greening. Purposeful effort to promote an economic market for native plant species will stimulate a niche economy for nursery owners wanting to specialise in native species or diversify their offering by increasing their stock of native plant species. But, this will require a partnership between the city council, local nurseries and NGOs.

For Dar es Salaam, enhancing the diversity and area covered by native plant species at the site-scale, whether it be as part of roadside greening, private residence planting or planting of parks and open space in the city, will support the achievement of the city's Local Biodiversity Strategy and Action Plan through two of the Action Plan's focus areas namely "Improve livelihoods through green infrastructure initiatives" and "Protect and restore natural infrastructure". A focus on native plant species in Dar es Salaam is also well aligned with 'An investment case for nature's benefits in Dar es Salaam', which sets out the business case for greening selected areas of Dar es Salaam's city centre.

Local action that includes the enhancement of native biodiversity also supports global biodiversity targets:

- The 15th United Nations Convention on Biological Diversity Conference of the Parties (CBD COP15), which took place in 2022, contracting Parties finalized the Post 2020 Global Biodiversity Framework (GBF), the Kunming-Montreal Global Biodiversity Framework, charting a way forward for global action to halt biodiversity loss. The GBF seeks to catalyze impact, calling all governments to move towards transformative action where a whole of society approach, which includes indigenous peoples, local communities, civil society, and the private sector is used to act in unison towards achieving the outcomes it sets out in its vision, mission, goals and targets. The framework facilitates the implementation of the shared vision where, "By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people." In particular, GBF Target 12 is specific to human settlements: "Target 12 urges for increasing the area, quality and connectivity, and improving access to and benefits from green and blue spaces in urban areas. This can be achieved by mainstreaming the conservation and sustainable use of biodiversity; ensuring biodiversity-inclusive urban planning; and enhancing ecological connectivity and integrity thereby improving human health and well-being and connection to nature, and contributing to inclusive and sustainable urbanization, and the provision of ecosystem functions and services."
- In addition, the "Plan of Action on Subnational Governments, Cities and Other Local Authorities for Biodiversity under the Convention on Biological Diversity (2023–2030)" is intended to support Parties, subnational governments, cities and other local authorities and their partners in implementing the Kunming-Montreal GBF and is intended to be implemented in accordance with national legislation.
- Cities and municipalities can upload and track their progress and actions towards global biodiversity targets by using the CitiesWithNature (CWN) online platform. The CWN platform is endorsed by the CBD as the official monitoring tool for the GBF.

5. REFERENCES

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INTERACT-Bio project at a glance

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