Vipingo Property Conservation Actions

The garden from my initial observation is a mix of both native and non-native species. To restore the garden to a more natural landscape would require a slow transition, training of the onsite staff and the removal of selected species while adding indigenous species where feasible.

The front of the property is mostly natural with already established indigenous species. The back of the property has been well maintained and 'designed' to be more of an 'English' garden and therefore has a mix of both native and non-native species. Although not all non-native species impact the environment negatively, there are a few species that I would highly recommend are removed, managed or planting should cease going forward, they are listed below;

Species	**Why?**	**Actions going forward**
Frangipani (*Plumeria* spp.)	- Not native. - Does not benefit the local wildlife or natural environment. Planted purely for decorative purposes. - There are no native insects, arthropods, birds, reptiles, etc that know how to use this species, as nothing has evolved with it, instead, like many exotics planted it creates a 'green desert'.	1. To cease planting any *Plumeria* spp. going forward. 2. To remove frangipani from the garden and replace it with an indigenous species instead.
Neem (*Azadirachta indica)*	- Not Native. - Grows well and therefore can be very invasive, outcompeting native species. - Can dominant the landscape if not managed.	1. The gardener should go round the garden weekly and remove all neem saplings/wildlings. 2. Only neem trees with a trunk diameter of approximately 8 cm should be removed. More established species should remain, as they provide shade/ forest cover and could possibly be removed at a later date once indigenous species have been established.
Palms (*Arecaceae* spp.)	- Not Native, all palms originate from South America. - Planted purely for decorative purposes. - In comparison to other species benefits the environment the least. For example, produces little oxygen, removing 17x less ozone and 14x carbon than an average oak species. - Water consumption is incredibly high. - Does not prevent erosion, and can change the soil composition, which then out-competes other plant species. - Palm fronds are very resistant and cannot be composted. - Some palm species are very invasive.	1. To cease planting any *Arecaceae* spp. going forward. 2. Ideally, remove all *Arecaceae* spp. from the garden and replace with indigenous, however, not all palms are invasive, so removal can be slowly done, then replaced with indigenous species. 3. Further assessment with Norbert (Kivokuni Indigenous Tree Nursery founder) will help identify the invasive species.

There are other non-native species found along the coast that do benefit native species and are not invasive, for these species, they should remain, but I would recommend that future planting should always favour indigenous species. These species being *Bougainvillea* spp, the moringa tree (*Moringa oleifera*), the flamboyant tree (*Delonix regia*)* and mango trees (*Mangifera indica*). Instead of mango trees, I would plant a variety of *Ficus* spp, there are several species native to the coast and it is favoured by a high diversity of wildlife.

There are numerous species native to Kenya which offer similar decorative outcomes but being native, would provide more environmental benefits. These benefits being;

- Indigenous species will encourage wildlife to visit and utilize the garden, from mammals to insects, as animals have evolved special adaptations to utilize native flora.
- They will not impact the surrounding environment by changing the soil composition or absorbing too much water as some non-native species do.
- Once established will need very little maintenance as they are already adapted to survive in this environment.
- They will not become invasive, again because they are in their natural environment.

The following photos are of some of the 350 native species found at the Kivokuni Indigenous Tree Nursery (KITN) in Kilifi. These species are all found in the area, with many on the IUCN Red List. I have provided photos of some of the species found at KITN, which in my opinion offer ornamental value. The Vipingo garden could eventually be a great living example of how people along the coast can still have a beautiful garden without compromising the environment.

Picture on right: Indigenous species that produces unusual green flowers

*The flamboyant tree often seen along the Kenyan coast is not native, however, there is a native *Delonix* sp. found along the coast, which can be found/purchased at the Kivukoni Indigenous Tree Nursery (KITN).

Pictures: Indigenous species that produces very pretty ornamental flowers.

Pictures: Some of the Indigenous euphorbia species at the nursery, the ones photographed are all on the IUCN red list and are highly endemic. Often mistaken for cactus, however, euphorbias are indigenous to Africa unlike cactus species.

Next Steps/ Recommendations

The garden should be slowly transitioned, and we should ideally aim to have a high percentage of indigenous species and minimal exotics. The garden would be a great living example of a well-manicured garden using indigenous species. People will often choose exotic species over indigenous, either due to lack of awareness/knowledge or because they have a set vision and see indigenous as 'messy' and 'ugly'. It is important that we promote the diverse species that are already available and discourage the repetitive habit often seen by land developers of planting exotic species over indigenous. Therefore, the garden could help showcase to homeowners, businesses, or general landowners what a garden using mostly indigenous species would look like.

In addition, we would be helping restore some of the vulnerable species that are slowly declining along the coast. In the long-term, I would like to explore a partnership with KITN and Colobus Conservation to collaborate on reforestation projects, educational campaigns and the development and distribution of materials along the coast to encourage a change of the behaviours mentioned above.

As mentioned above, there are some simple actions that can be taken with immediate effect these being;

- weekly removal of neem saplings;
- removal of neem trees with a trunk diameter of approximately 8cm.
- removal of all frangipani species.

On my next visit, I will organise for Norbert Rottcher, owner and founder of KITN, to visit the Vipingo property for further assessment of the garden and for his recommendations. Once COVID-19 has calmed, I would like to arrange for Kirwa to be spending a couple of days a week at KITN to learn about the importance of indigenous species, improve his gardening skills and to learn how to keep an indigenous tree nursery. Kirwa could potentially then develop and manage a small indigenous nursery on the properties and consult and advise on what species should be planted. I would like Kirwa to be part of the planning and development of the gardens, this is also why, apart from the immediate actions outlined above, I would like us to develop the garden slowly. Kirwa can then be part of every stage, being an active participant in the decision process. He will then be able to identify indigenous vs exotic species and take the necessary actions. I am currently developing a working document which lists indigenous species and useful information about each. This can then help guide Kirwa and future replanting efforts.