Mango Trees

The Arabuko-Sokoke Forest is a dense indigenous forest on the Kenyan coast. It lies between Arabuko and Sokoke, which are villages located in the area between the larger towns of Mombasa in the south and Malindi in the north. The Arabuko Sokoke consists of four kinds of forest vegetation. At the sea there is *Mangrove Forest*. Mangroves is the one of the few species of tree growing in saline water. They need the tide for their existence so you find them usually on the shore and in creeks where the water is coming and going. When the water resides the entangled root structure gets exposed. Going further inland you find *Brachystegia Woodland*. Named after the majorities of trees in that area, the *Brachystegia,* a tall species of tree found across central and southern Africa. In this section there is little undergrowth and shrubs. Further in still you have the *Cynometra Zone*, another tree family which grows in coast regions on white, sandy soil. These trees are not as tall, have a lot of leaves and create a thick and impenetrable forest. In between the Brachytsegia and the Cynometra you have a zone of *Mixed Forest* of the two kinds.

I encountered various traces stemming from the colonial period in all three forests types of the Arabuko Sokoke as it was one of the forests which was

demarcated fairly early when Kenya was the East Africa Protectorate (from 1895-1920) before it became a British Crown Colony in 1920. In the National Archive of Kenya I found letters from 1902 where a forest ranger patrols the boundaries of their demarcation. The forest guide Willie Ng'anda told me that the network of paths and roads which are used in the forest today, are former logging paths established in the early colonial period. There were of course paths and buildings in the forest before the colonial time such as those surrounding the famous Gede ruins. This is a complex of coral brick ruins which evidence an urban metropolitan setting that predates the British presence by more than five hundred years.[1] But the paths put in by the British Forest Administration served the use of harvesting the forest. With Willie's help I found other traces of this British colonial project. For example, he showed me clearings where the colonial forest offices used to be. To my surprise the clearings are still very visible, they have been overgrown with high grass but no trees where able to put their roots down. I wondered why? I always assumed that in a dense forest trees compete for light. In my opinion these clearings would be perfect places to start a tree life.

Another trace I saw around these clearings were mango trees. Two big trees stood in between the other trees. In fact they were so hemmed in by other trees that I could hardly see them, so Willie had to point them out for me. He told me that the trees were planted by the colonial forester next to his offices. Mango trees are not indigenous to Kenya, they are exotic, originating from South Asia. Willie suggested that there used to be more plants around the base that the forest officers had planted like a garden. The mango trees are the

ones which he knows of that remained. Why did they survive and grow and not the others?

Research on plants and trees shows that increasingly they can be understood to have cognitive abilities of perceiving, processing and communicating with other plants and organisms.[2] They are able to remember, learn and adjust their behaviour accordingly. In a forest, plants form collaborative networks which enable them to speak to each other, send each other warnings and care for each other. This means that plants and trees can be understood to make decisions and take action. They have agency.

Below ground, plants and trees form intense symbioses with fungi species. A vast fungal network connects the roots of single trees in a forest. This mycorrhizal symbiosis is to the benefit of both the plant and the fungus. The fungus forages nutrients from the soil and trades it with photosynthate (i.e. sugar) from the plants. The root-mushroom mesh stretches over huge forest areas to meet the demand in a forest. Many plants get enough nutrients and water from the soil to survive, reproduce and grow only through the help of the fungal connectors. Their connection is vital. This connection of plants and root-inhabiting fungi is considered to be responsible for facilitating the chemical destruction of stone into soil and the migration of plants from the sea to the land 360 million years ago.[3]

Through this massive subterranean root-fungi system, one single tree has hundreds of connections to other trees, both intra- and interspecies. Trees can send carbon, water and other nutrients through these connections to their

fellow plants. The eldest and biggest trees in the community play a vital role. The forest scientist Suzanne Simard calls them "Mother Trees".[4] Through their height they have better access to sunlight which makes them produce a surplus amount of resources. They send the spare nutrients through the mycorrhizal highways to smaller trees in the undergrowth of the forest, thus ensuring their survival. The needier the tree, the higher the transfer. In addition, warning signals are sent through these mesh networks to defend the community from danger and enhance the resistance of the whole forest. Undesirable, intruding tree species are attacked with poison to secure the forest community's population. Trees can recognize their neighbours that are genetically related to them and, depending on the safety of the environment, supply their kin with more or less resources. When the mother trees are about to die they pass on their nutrition to their kin and neighbours, so that no resources are lost.

All this research suggests that plants have cognitive ability, something which is usually only considered to be a quality of humans and animals because of the neural brain. But the communication network of a brain and a forest offer fertile comparisons. In a brain neurons and axons are nodes and links to provide information flow. In a forest trees and the mycorrhiza fungi function as nodes and links and provide a structure for information transmission.[5] This parallels are reinforced by the research of Monica Gagliano which evidences that in addition to supporting chemical transmission the network structure also supports the transmission of sound.[6]

If we understand communication as „the transfer or sharing of information through a common system of signals that benefits both the sender

and the receiver“[7], then the transmission of signals and information through root-fungal networks can be clearly understood as communication. And for communication to occur there must be a structure of mutual reading and understanding of the signal, a kind of language. Language assumes multiple forms; it can be spoken or written in words, and exist in signals, sounds or chemicals. It is a structure that helps communities of plants, humans, animals, to make sense of the environment they are living in and is crucial for survival. The language between trees, root-inhabiting fungi and other organisms in a forest has evolved through repeated interaction between these different actors. The chemicals and the sounds transmitted between them can be understood as their vocabulary. A communication structure is vital for the forest community to get stronger, more resilient and to adapt to changes in the environment.

The colonial period from 1902-1963 was a change in the environment of the trees and plants in Kenya and also in the Arabuko-Sokoke Forest. The forest was severely harvested for many years. Especially old strong hardwood trees, like *Mbamba Kofi* and *Muhuhu* were cut down to support the demand for valuable hardwood. Taking into account the research on network structures in a forest, one can imagine the impact on the forest community if the majority of the elder trees are taken out. What wisdom for survival for the whole community gets lost when thw Mother Trees are gone? What new resilience is built on the basis of that experience? Exotic plants like the Mango trees were planted in the Arabuko-Sokoke Forest. Some survived and others not. What led to the decision of the forest in having them grow and others not? Experiencing

the forest as a cognitive entity, which reacts, decides and has agency, changes the power dynamics of human over nature which were established during the colonial period. The thinking forest challenges the existing hierarchies which are perpetuated by a persistent and pervasive colonial ideology.

„Power is the relational capacity that enables a social actor to influence asymmetrically the decisions of other social actor's in ways that favour the empowered".[8]

If we understand power to exists in relations, this means there is a certain reciprocity implicit within the notion. So, in asymmetrical power relationships one side is stronger in influencing the other side, but nonetheless even those who are subjected also have a certain power. Hence power is something which is asserted, typically through violence and discourse.[9] During the colonial period the colonised were subjugated by both physical and psychological violence. In the postcolonial period this asymmetric power relationship continues to be maintained through a continuing discourse which does not acknowledge the power of the other actors in the constellation of the colonial system. Understanding plants as agents in the colonial period taints the clearly painted picture of the absolute power of the colonial masters over those subjugated. It allows us to rethink this period as a more complex constellation of actors.

1 Museums of Kenya. „Gede.“ Museums.or.ke. https://www.museums.or.ke/gede/. (Accessed March 2019)

2 Simard, Suzanne W. „Mychorrhizal Networks Facilitate Tree Communication, Learning, and Memory. Memory and learning in plants.“ In: *Signaling and Communication in Plants.* Hrsg: Frantisek Baluska, Basel: Springer International Publishing AG, part of Springer Nature. 2018. p 191

3 Ibid, pp 192-193.

4 Simard, Suzanne W. „The Mother Tree.“ In: *The Word For World is Still Forest.* Hrsg. Ann-Sophie Springer. Berlin: Haus der Kulturen der Welt und K. Verlag. 2017. pp 67-71

5 Simard, Suzanne W. „Mychorrhizal Networks Facilitate Tree Communication, Learning, and Memory. Memory and learning in plants.“ In: *Signaling and Communication in Plants.* Hrsg: Frantisek Baluska, Basel: Springer International Publishing AG, part of Springer Nature. 2018. pp 195-197

6 Gagliano, Monica and Mavra Grimonprez, Martial Depczynski, Michael Renton. „Tuned in: Plant Roots Use Sound to Locate Water.“ In: *Oceologia.* Hrsg: Carlos L. Ballaré. 184(1). Berlin Heidelberg: Springer Verlag. 2017. pp 151-160

7 Simard, Suzanne W. „Mychorrhizal Networks Facilitate Tree Communication, Learning, and Memory. Memory and learning in plants.“ In: *Signaling and Communication in Plants.* Hrsg: Frantisek Baluska, Basel: Springer International Publishing AG, part of Springer Nature. 2018. p 200

8 Castells, Manuel. *Communication and Power.* Oxford: Oxford University Press. 2013. p 10

9 Ibid, p 11.