

Tanzania day 4: Field Trips

We saw a lot of schoolchildren in uniforms yesterday – in the afternoon, they were walking past carrying hoes. We go shopping for a cable to charge my phone and camera: I've lost one cable and broken the other, so it's off to the local shops, each of which points us to another one: general store, electronics shop, phone shops, camera/video shops, some in buildings, others in plywood shacks. Finally have two colourful cables with smiley faces on the ends (the powerstrips in the shape of hearts are tempting too). Avery buys fruit from a lady with a huge basket on her head: it takes 2 of us to lift the basket back up. We check the cable: it's the car adapter that's broken, not the cable: the team lends me an adapter for the ride. Add to field shopping list: car chargers, and lots of them. The car is filthy: I just miss a shot of it parked next to the same colour and model: left car is red; right car is brown.

Gervase and I talked about sample areas last night. One set of sites is in a wildlife area, with twin dangers – from the wildlife, and from the poachers chasing the wildlife. The team can look "official" in their khakis – Joseph tried to ask a local man for directions yesterday, but the man ran away – a common thing here. I have huge bruises up my arms, splinters everywhere, torn jeans – but no bugbites. We saw trees, plants, flowers yesterday but almost no wildlife: some insects and butterflies (not many), birds (ditto): nothing larger, although we did find wild pig poo and some elephant damage on a tree. We also found an animal trap on the path (Joseph got caught in it), but the jungle was eerily silent.

We arrive and walk to the first site (300 metres through open woodland – yay!), but the site's start point is in a swamp. This happens occasionally, and there's a protocol for it: the team moves the corner to dry ground with similar vegetation to the swamp, and marks on the papers that they've done this.

Joseph explains the sampling protocol in detail and I take many many photos of soil, buckets and poles. First tree-counting: they use the ranging pole (long pole with tape markers every 50cm) to find all the trees within 1.5m of the plot start point ("corner"), then they measure every tree over 5cm diameter and 50cm height (knee height). They do this so the analysis team can estimate carbon sequestration in this area. Each tree's diameter is measured with a tape; the small tree heights (5m or less: the ranging pole is 2.5m long) are measured with the ranging pole; the larger tree heights with a clinometer; the tree's canopy width is measured with the ranging pole (in dense woodland, one person shakes the tree so the others can see where the canopy is). Once the team starts on a plot, the same team member does the same measurement jobs at every "subplot" point: because people's estimates vary, this gives some consistency of measurement across the plot. The team takes soil samples by putting down the metal plate and pushing a corer (also marked up with tape) through the hole in it; putting soil into buckets marked 0-20cm (topsoil), 20-50 (subsoil), 50-80 and 80-100cm (the 80-100 sample is only taken in the first corner): these depths are based on the Afsis (African Soil Information System) sampling protocol. The team also throws down a quadrant (50cm metal square) and counts the species in it, how much of each it contains,

how much bare earth, dung etc; and uses a densiometer (mirror marked into squares) to estimate the canopy cover north, east, south and west of the start point. They also hang a scale bag in a tree, put 500-900g of each soil in a marked plastic bag, weigh the bags, and also weigh marked metal pots containing samples of each layer of soil (the pots are added to a plastic bag attached to the scale).

We hear a shotgun – the team thinks it's just a car backfiring or tyre blowing out – there are very few guns in this region. We move on to the subplots. What we're doing is called the "E" plot – we're sampling a 100m by 100m square area, with "subplot" points every 20m in that grid (e.g. there are 36 subplots to a plot). The shortest path with the smallest errors through that grid is in the shape of a large "E" (eeeeesssswwwneeeenwwwneeeenwwwn), hence the name. At each subplot, the team counts and measures trees (trunk diameter, height, canopy width, species) and estimates the biomass only in the quadrant (from the average plant cover and heights). The team used to do the full works (everything done at the first corner) at each subplot, but the process was long and has now been streamlined.

There are lots of trees here – I learn Kiswahili for "please shake the tree". It rains a little, and we have 33 subplots to go. There's more noise here than in the jungle: birds are singing, insects are buzzing. I ask about wildlife protocols – there aren't any animal, insect or bird protocols yet. The team were going to set camera traps for animals, but they were too expensive; I wonder if there's something small and cheap we can hack together with a camera board, motion detector component and microprocessor.

We move over the road to a *Pinus Patula* (misheard as "Spatula Pine", which causes much amusement) plantation – well-spaced small trees with soft spines and wild mint growing underneath. We talk about Apopo's work on mine-sniffing and TB-sniffing rats, and how this works in Africa but not so much in SE Asia. At every corner of 100m grid, we take soil samples and do detailed quadrant analysis; we also do this at the centre of the plot, where we take a panoramic photo (the camera has built-in GPS). I'm still picking thorns out of my head; at the centre, I sit on a fallen log, and Avery rushes to brush the ants off me (I now have ants in my pants). It rains heavily. The team gets wet, and the car goes red again.

The team has split into two, to get two sites done for the day. We drive over to the other site; it's raining heavily so Avery and I sit in the car and work on our laptops. She gets a good data signal for the first time in days (the signal at the hotel is non-existent) and I manage to post an "I'm safe" home. The flowers here are beautiful, making the site look like an English cottage garden: huge purple mallows and something that looks like clematis overlaying delicate yellow flowers – I wonder how many common British garden plants have come from here. It stops raining for a while (this rain is monsoon-grade), so I walk out to the site: across a swampy valley, through woods, across grassland to a firebreak between woods. I find the team's start point (an umbrella over the sample pots), and track them to the edge of the woods – which look impenetrable: someone has chainsawed the plantation but, puzzlingly, not taken away the fallen wood. Trees have grown up

through the fallen wood, and the whole effect is one of a giant woven basket. I hear the team's voices, find a not-so-bad patch, and push through, under, over, across trees to reach them. They seem surprised: they've been pangaing through these woods for hours now, and weren't expecting anyone to just go through them. They're still on the outside legs of the "E" plot – with 22 subplots to go. These are very different woods than the morning, so I tag along to see how they sample in dense woodland. There's a lot of scrambling but not so much wait-a-minute here: today is branch scratches rather than thorns. Moses the biologist tells me that there are two species of wait-a-minute, and that the one by my head is related to the orange tree – I crush a leaf, and yes, it smells of oranges. In the firebreaks, I see animal tracks going into the wood – later, whilst crouched under a fallen tree, I hear what sounds like a boar grunting annoyance. It gets late: 5:30pm in a place where the 6:30pm sunset is a sudden from light to dark. The team has 10 plots left to do, and push on, quickly measuring trees and assessing the ground cover. Just before sunset, we finish and rush back to the cars before dark. I'm wet, cold, muddy, sunburnt (regretting not bagging that aloe) and happy that I understand a lot more about what it takes to collect this data, what it means and what we could do to help.