

# Enhancing Canopy Research in Africa: Insights from Tree Climbing Workshop in Ghana

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## Abstract

The report shares the background and experience executing a tree climbing workshop in Ghana. In most cases, canopy research in Africa is conducted under the umbrella of parachute science, leaving local scientists deprived of canopy access skills and equipment. Consequently, tropical Africa experiences a closed canopy so far as canopy ecology is concerned. In May 2024, ten (10) early career researchers from Ghana were trained in various rope access techniques, thus inoculating a community of climbers and setting the stage for advancing canopy research on the continent.

Keywords: tree climbing, canopy access, rope technique, canopy ecology

## Background

The forest canopy, a hub of unique biodiversity requires specialized skill and effort to access and observe (Lowman, 2009; Lowman and Schowalter, 2012; Nakamura et al., 2017). Restricted access to the canopy implies our understanding of forest structure, function and ecosystem services excludes the immense diversity of life in the canopy. This is the reality for many African forest ecosystems where current ecological knowledge largely excludes the aspect of canopy ecology. Knowledge gaps, however, cannot be addressed without first dealing with skill and equipment gaps so far as canopy access is concerned. Rope access systems, which have been in use for close to half a century and have in many ways revolutionized canopy research (Lowman and Schowalter, 2012), remain relatively alien to African tropical ecology researchers. They are however a cost-effective and come with very

low negative environment footprint when in use for research. Rope access techniques also provide forest wide access which is important for adequate and representative sampling coverage (Nakamura et al., 2017) in contrast to options such as canopy cranes.

In Africa, canopy research has been largely carried out by western experts who often depart with the rope access skill set and equipment that make canopy research possible – thus perpetuating the so-called “helicopter or parachute science”. This leaves local scientists in a situation where they are simply unable to independently continue with canopy research. Due to this, the African forest canopy is not adequately researched with several questions unexplored. On the whole, the African forests remain under represented in publications on canopy ecology, thus creating a scenario akin to “a closed canopy”, in terms of access but “gapping canopy” in relation to the enormous research gap. During the 8<sup>th</sup> International Canopy Conference held in Xishuangbanna Tropical Botanical Garden, Yunnan, China in October, 2023, most global datasets presented during the conference had limited contribution from African sites.

In view of this limitation, the Canopy Access Workshop was conceived from informal conversations between Steven Pearce (The Tree Projects, Tasmania, Australia) and Bismark Ofofu-Bamfo (University of Energy and Natural Resources, Ghana) on access limitations and how to overcome these. The canopy research gap cannot be bridged without capacity to access the canopy and conduct research. The goal for the workshop was to bring professional tree climbers to Ghana to train local and regional scientists and equip them with tree climbing skill set and gears which will enable them to do the work of canopy research themselves. In this way, the skills and experience will remain in Africa rather than depart with the foreign climbers at the end of the research. This approach required the acquisition of fit for purpose industry specific tree climbing equipment, recognizing that it will be of little practical use to train but not equip tree climbers with gears. Capacity building in the area of climbing skill and climbing gears will create an ecosystem of research-oriented tree climbers towards bridging African canopy research gaps. With such a workshop, African scientists would be able to take a self-determined pathway forward into the areas of research previously unavailable due to lack of access. This can potentially go beyond research and create a community of tree climbing experts in conservation practice, horticulture and tree care industry, wildlife and forestry professionals, ecotourism among others.

### **Implementation the workshop**

Significant costs to running a tree climbing workshop include climbing gears, trainers and participant costs (visa, flights, accommodation, transportation and feeding). In Africa where most countries are in developing or lower middle-income status, the cost on participants for a tree climbing workshop would be simply impossible, even for academics and researchers. Using Ghana as a reference, where 75% of public sector workers earn a monthly net salary less than 3000 cedis (~200 USD) (Ghana Statistical Service, 2023), a tree climbing training is simply luxurious and prohibitive but necessary if upcoming of students and researchers can help address knowledge gaps in canopy science in Africa. To deliver this training, we counted mainly on the generosity of manufacturers who made equipment donations and trainers who were willing to commit their time to the project for no financial emoluments. Four complete sets of climbing equipment were mobilized and subsequently donated to the Department of Biological Sciences, University of Energy and Natural Resources in Ghana.



Climbing equipment donation (valued at \$19000.00) to the University of Energy and Natural Resources, Sunyani Ghana. The donation was received by Ag. Pro Vice-Chancellor, Prof. John Mensah Kuwornu (middle).

The donation was generously sponsored by Teufelberger, DMM, PETZL, Husqvarna Australia, CSP Distribution and LRV8 Rescue. **Teufelberger** donated four sets of TreeMotion Essential Climbing Harness, four 45m CEclimb Moving Rope Systems, two 180m xStatic access lines, four 60m throwlines and 4 HipStar Flex lanyards. **DMM Whales** donated 22 Ultra O triple action carabiners, Pulleys and accessory carabiners. **PETZL Foundation** provided foot ascenders, knee ascenders, equipment bags and helmets. **CSP Distribution** in Australia donated a bigshot line launcher and trigger and four rope wrench systems. **Husqvarna Australia** provided throwbags and throwline cubes. **LRV8 Rescue** donated 4 equipment bags.

Three tree climbing experts and trainers volunteered their time and out of pocket funds to travel to Ghana and provide training for early career researchers and students. The experts were:



Vicki Tough ([Sylvana Alta, Tubingen, Germany](#)) is an arborist and tree climbing instructor who combines her passion for tree climbing and her background in zoology to promote scientific exploration of forest canopies. She has participated, organized and led research expeditions worldwide.



Sam Hardingham ([Everydayarbor, New Castle, Australia](#)) is an experienced arborist who has worked with ecologists from University of Sydney, World Wildlife Fund, Science for Wildlife and Birdlife Australia. He is also experienced in delivering arboricultural practical training and currently is a part time teacher at Ryde TAFE NSW.



Steven Pearce ([The Tree Projects, Tasmania, Australia](#)) is an award-winning photographer and filmmaker, an avid tree climber and a passionate naturalist. His work in Tasmania and most places in the world focuses on protecting giant trees and promoting recreational tree climbing.

The workshop took place from 13<sup>th</sup> to 22<sup>nd</sup> May 2024 at the University of Energy and Natural Resources, Sunyani, Ghana. There were 10 participants who participated in the workshop. The workshop had a pre-course component of practicing various knots and hitches (double overhand stopper knot, figure of 8, figure of 9, alpine butterfly, bowline, stopper/poachers knot, traditional Prussik knot, Blakes hitch, slip knot, Prussik, distel, VT, etc). The training sessions covered visual tree assessment, setting throwlines, moving rope technique, static rope technique, change over, rescue rigging, equipment handling, and working with data collection objects such as sweep nets, trail cameras, blades and secateurs. Some aspects of the training used trees on the university campus, and also at the city parks in Sunyani. A field trip to a forest field site (Boabeng Fiema Monkey Sanctuary) also provided an actual experience of an area where a study could be conducted.





L: Classroom session of Tree climbing workshop in Sunyani, Ghana, May 2024. R: Vicki and Sam take participants through visual tree assessment during the Tree climbing workshop in Sunyani, Ghana, May 2024.



L: Vicki illustrating the moving rope technique during the tree climbing workshop in Sunyani, Ghana, May 2024. R: Sam illustrating climbing and changeover techniques to tree climbing workshop participants in Sunyani Ghana.

### **Future for canopy research in Africa**

The Tree Climbing for Canopy Research workshop represents a skill inoculation into the African ecological research landscape. The trainees drawn from lecturers, technicians, masters' students, teaching assistants, and conservationists ensures that the skill set provided through the training will be retained and used within participating institutions and disciplines. Research interests of workshop participants ranged from tropical forest microclimate and phenology, primate and small mammal ecology, plant animal interactions (e.g., insect herbivores), plant functional traits and resource acquisition strategies, canopy insect ecology, microbial profile along vertical canopy structure, among others. These interests represent areas where fundamental canopy ecology questions are yet to be explored in Africa. With tree climbing training, it possible to begin to explore basic questions regarding tropical African forest canopies that bother on:

- life in the canopy: unearthing community structure and dynamics of living organisms from micro- to mega- fauna/flora.
- Canopy-level interactions: pollination, dispersal and other interspecific interactions within canopies.
- Canopy atmosphere interactions: microclimate within canopies, response of leaf functional-trait to variations in canopy microclimate.

These first cohort have the potential to become tree climbing trainers and trainers of trainers, creating an avenue for sustainable skill transmission to future postgraduate and undergraduate



students. A future workshop is necessary for the first cohort and new students as well. In implementing the Canopy Access Workshop, there were some applicants from the West African subregion and other parts of Ghana who could not attend due to funding limitations. Such a workshop will also be well placed within a research data collection expedition context where participants get the opportunity to employ their new skills in actual field data collection set up. This can be possible with a proper funding support.



Participants in the tree climbing workshop in Sunyani, Ghana demonstrated various levels of rope access skills and techniques at the end of the 10-day tree climbing course.

### **Acknowledgement**

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### **Additional information**

Read more on the project at: <https://www.thetreeprojects.com/ghana>

Watch a 30-minute documentary of the workshop at: <https://youtu.be/0ey6s2IIR5U>

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