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Interview

View from the top

American tree top specialist *Margaret Lowman*, on a scholarship to India, is hoping to build canopy walkways here. Her aim: using ecotourism to boost conservation. *Vijaysree Venkatraman* chats up the canopy scientist nicknamed "Einstein of the Treetops".

Margaret Lowman is a pioneer in canopy science, a subset of field biology, and the author of the best-selling *Life in the Treetops*. She also co-authored *It is a Jungle up there* with her two sons. A professor at North Carolina State University and Director of the Nature Research Center in Raleigh, she is currently a Fulbright Senior Specialist Scholar to India.

Q . What fascinates you in tree top research in India?

A . I first came to India many years ago in the mid-1990s to help colleagues set up the first-ever canopy research in India's forests. Now the **team** has India's premier canopy researchers. I continued my close links with the team, and co-chaired the 5th international canopy conference in Bangalore in 2009.

That led to a Fulbright senior specialist scholarship for me to return and mentor students, hosting canopy workshops, meeting forestry groups in four Indian states to discuss conservation and also ecotourism as an educational tool. We hope to build some canopy walkways in India, and give lectures to inspire teachers and scientists around the country.

Q . What is the state of canopy science in India?

A . India is very new to canopy science. At the moment, scientists from across the country from different universities and institutes work under the umbrella of ATREE (Ashoka Trust for Ecology and Environment) though there are other individuals who work by themselves too.

The leadership of Soubadra Devy and T. Ganesh is at the heart of canopy research throughout most of India. The three of us comprise a team.

Q . What is the most important tree top research project currently underway in India?

A . Important tree top research currently underway in India is twofold — to survey what lives there (since most of India's biodiversity is found nowhere else on Earth) and to calculate their ecosystem services, meaning to explain to the Indian people exactly what the canopy does to insure their quality of life and to insure a healthy life for the next generation.

To that end, one of the most important works currently is a new volume, which summarizes the state of India's forest canopies and also neighboring countries — co-edited by the three of us — and it will be out in 2013.



Lowman using her single-rope technique to climb atop a tall strangler fig in Queensland, Australia.

© Margaret Lowman

Q . Why is it so important to study life in the treetops?

A . Forest canopies are the interface between atmosphere and earth — a critical place essential for life on earth. Also, canopies contain almost half of our land-based biodiversity — a huge genetic library of species — and are the source for many important services that provide life on earth: energy production from sunlight, hotspot for fruits and flowers, gas exchange, carbon storage, homes for millions of creatures, and climate control! We need to understand forests — especially, their canopies — because humans can not live without trees.

Q . So, why is there such great biodiversity in tropical rain forests? Are forests safe in places where human population is swelling?

A . Tropical rain forests have perfect climatic conditions — warm and moist — over relatively long time periods enabling many species to evolve there. India is a unique and special tropical region, since many species inhabiting India's rain forests are found nowhere else on the planet.

Practical conservation strategies include developing ecotourism (so people pay for activities such as canopy walkways, bird-watching, resorts, health spas in the forests), sustainable harvest of special rain forest products (timber, fruits, coffee, medicines), international payments for the growing importance of carbon credits (forests are one of the biggest sites where carbon dioxide from pollution is absorbed and stored by trees), and education so that the next generation understands how forests keep us healthy.

Q . Your first climb was as a graduate student in Australia in 1979. What was your mission?

A . My first climb was to study leaf longevity. I had a simple question — how long do leaves live in the tropical forest canopy? I expected the answer would be about 1-2 years and I could write up my PhD thesis very fast. Was I ever wrong! Some of my leaves lived 20 years, but I did finish my thesis before they fell.

Q . Since then you have climbed trees on other continents using a variety of techniques and tools, some of which you pioneered in the last thirty years.

A . I helped to create the first set of tree-climbing rope techniques — on my own in Australia — using ropes, slingshot, a harness made from seat belt webbing, and adaptation of climbing hardware from cavers. I went on to help design the world's first canopy walkway when I realized that it would be great to have a team of students in the canopy all at once (ropes are solo efforts); then I worked with a French team who made a hot air balloon, and we made many refinements to that apparatus including a sled. I have used/designed different towers and tree-house types of set-ups for remote canopy research.

Q . So what were some of the major, and unexpected research findings, in the last thirty years?

A . Some major results include: 1) almost half of terrestrial biodiversity lives in the tops of tropical trees, and we never knew that before a handful of us started climbing trees; 2) most insects prefer to eat leaves at night; 3) leaves live a long time in the canopy (or at least some do); 4) insect defoliation leads to the trees investing in defensive chemicals that in turn become medicines used by many cultures; 5) rain forest seedlings are not quick to regenerate.

Q . The canopy region remains a zone that is, perhaps, even less known than Mars, you've said. What are some of the challenges facing canopy science?

A . Canopy research is under-funded, in part because it is less glamorous than studying Mars! Canopies are

situated in remote sites that require overcoming the challenges of gravity, mud, toxic plants, venomous animals, tropical diseases and lack of creature comforts to conduct research. And finally, one enormous challenge is that it seems financially profitable to cut them down, because the benefits of forests involve 'hidden costs' such as cleansing fresh water, cleaning the air, producing oxygen, and climate control – things that are hard for people to see in their everyday lives.

So it requires a great deal of education and dedication to inspire forest conservation before it is too late!

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