

Morningside threatened

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Over the past 540 million years, since what is referred to as the Cambrian Explosion when hard bodied animals and many other lineages first evolved, there have been five major biodiversity extinction events (popularly known as mass extinctions), where most of the organisms that were living on earth were wiped out. These extinction events were caused mostly by factors such as bolide/meteorite impacts on the Earth, volcanism and in a few instances by the evolution of distinct groups of organisms such as diversification of ferns, pines, conifers and flowering plants. Depending on the type of factor under issue, and the timing of the event, often either predominantly marine organisms or terrestrial organisms perished. However, currently, a single species, human beings, are causing the sixth major global extinction event. This is at an instance when our Earth is holding the greatest diversity of organisms ever to inhabit the Earth. Current human activities are influencing inhabitants of both the aquatic and the terrestrial realms.

Sri Lanka of course has not been spared. Pre-historically, Sri Lanka has lost even a portion of its most charismatic vertebrates such as Lions, Tigers, Hippos, Rhinos and Gaurs probably due to the basic activities of the Neolithic Balangoda man. More recently, over the last 200 years or so, forms such as Vil-Aliya (a marsh dwelling elephant), several prominent fish species and 21 species of frogs have been lost to Sri Lanka and the world; the loss of less well known insects, mollusks and other invertebrate extinctions remain un-quantified, perhaps forever. Continuing and hastening this trend, Sri Lanka is now on the verge of applying an unprecedented amount of pressure on one of her most important ecosystems, which harbour many point endemic species (species found only in a single locality and no where else in the world).

Morningside, with open Patana type meadows, rippled by knurled cloud forest patches, troughed through by gurgling mountain streams, undoubtedly holds the deepest secrets compared to any habitat in Sri Lanka. Over the last ten years or so, together with several colleagues, we have been frequently visiting the Morningside region to explore its biota. Through these visits and research we discovered a number of amphibians, small mammals and gekkos that are scientifically important. We found and described several new species of tree frogs (*Pseudophilautus poppiae*, *P. decoris*, *P. auratus*, *P. ocellaris*, *P. simba*, *P. lunatus*, *P. papillosus*, *P. procax* and *Polypedates fastigo*). Of these, except for *P. auratus*, all other frogs are only found in the Morningside region (not even in the western side of Sinharaja). These frog species are new to science and were recorded for the first time in the Morningside area. The International Union for Conservation of Nature (IUCN) recognizes these species as being Critically Endangered species. Critically Endangered species are those that have an extremely high risk of facing extinction in the wild, based on a set of IUCN criteria that can be applied globally. All these frog species are habitat specialists that require, among other conditions, the shade and humidity of the montane cloud forests for their survival. These species are not found in the open grassland and heavily degraded habitats with wide diurnal temperature fluctuations, and they will also not traverse such habitats.

We have also found new forms from other groups of organisms. During our work we noticed that the *Crocidura miya*, a montane shrew species, from this region had different coat characteristics and also a shorter tail relative to its body. Further study of its features and its genetics showed that this is a species also new to science. We named it *Crocidura hikmiya*. As a common name, though we called it the Sinharaja shrew, we discovered it for the first time from the Morningside region. This was done because we recognize Morningside as a single biogeographic unit with Sinharaja. Its distribution is wider than the aforementioned frogs, and goes down to about 450 m above sea level. So far, this species is found only in Sinharaja and the Morningside region. From the frog and the small mammal examples reported here, it is evident that there are species restricted just to the Morningside region, and also species restricted to Sinharaja reserve and Morningside area; meanwhile there are also several frog species that are restricted to the Sinharaja-west area, and not found in Morningside.

This is not the first time that Morningside has come under threat, as Prof. Nimal Gunatilleke also elaborated in his article in *The Island* (21st Sept. 2011). In addition, there is constant pressure on this ecosystem that is sometimes not quite that evident. For example, in 2004, when we were doing fieldwork for the mammal studies, we stumbled on a forest clearing operation. It was by the gravel road leading to Morningside, apparently on LRC land.

There were tree trunks everywhere and a wide gap had been opened up in the forest canopy. When we reached the Forest Department bungalow in Morningside, the bungalow keeper, who

also acts as a watcher of the surrounding forest, was in total despair. A top politician and police officers were responsible for this destruction and he was fearful of them. As a duty to our nation, we had to report this, and we did, actually to the President of the country of that time, Chandrika Kumaratunga. To her credit, getting to know what was going on, she stopped the whole operation within two days, sending off the police officers and severely disparaging the minister under issue. Morningside was saved then; the high-powered encroachers of the LRC lands were vanquished at the time.

After this, and even before that clearing incident, there was a move by the Forest Department to acquire the land surrounding Morningside under their protection. Over the years, a fair amount of progress was made in demarcating what was actually under the Forest Department's protection and identifying the land that can be easily be acquired. Even sources of funding were delineated. But for many reasons, the project slowly died down. However, the desire for the political elements to encroach this paradise never died. This not only persisted but grew stronger; elaborate plans were drawn to draw and instigate even the people and the clergy of the surrounding villages under issue.

In 2004, the villagers of the region were very much against clearing the forest in this area, especially to be used by the politicians. However the issue of Morningside has cropped up again. This time, in the form of a road that traverses this fragile forest to maximize access to the LRC lands. It is now being told that the government is only trying to improve a road that had already existed, for the benefit of the communities that live there. They further justify this by disclosing that the road is actually outside the Sinharaja World Heritage Site and in the Morningside area. Scientifically, this really is an issue that needs close focusing.

Robert McArthur and E.O. Wilson (world renowned biologists) during the 1960s came up with an idea now popularly known as the theory of island biogeography. This theory aims to explain the species richness of an area (an island) through immigration and extinction. Factors such as the distance from the main source population affect the immigration rate and extinction rate. Further, the extent of land area determines the survival rate of the species that immigrate. In its original formulation, this theory involved only islands, but it has also been used to explain the species richness even in fragmented habitats that are isolated, due to human habitations or deserts, or even mountain-top adapted species that are restricted just to the mountain tops.

Morningside is not only a montane isolate, but also an area surrounded by human habitations, except at one end. This end is the western side of the Morningside reserve, which is connected to the Sinharaja World Heritage Site. More importantly at this end, Morningside has a natural gradient starting from about 1400m down to the lowland areas of Kudawa (at about 450m). This

uninterrupted gradient allows the movement of many organisms across the elevational range. For instance, due to a cooling or a warming event, various groups of animals and plants can disperse up or down along this gradual gradient. If however, an effective barrier is created between these two upper and lower elevation areas, the connectivity is lost and this will result in extinction of a large number of species. The more effective the barrier, the better it is at preventing the exchange/movement of organisms. So if the government improves the so-called road from west to east, together with tourist hotels or tea estates along the road on LRC lands for a good measure, the barrier for the movement of fauna of the region is pretty much complete. Except for some birds and small and large mammals, the highly specialized forest species (who are already critically endangered) will never cross that barrier. This will effectively prevent immigration of organisms and that would contribute to extinctions, not only of the Morningside region, but also those of the Sinharaja region as well.

Genetic analyses carried out by us also shows that the Morningside region is a center of endemism. When frogs of the region are considered, within their clades, they are some of the most primitive (basal) lineages that exist in Sri Lanka. This suggests that this area had been a refugium from various threat factors (such as climatic change) during the prehistoric times. Usually, an area that is considered as a center of endemism also holds the greatest genetic diversity. So what we are going to lose through the loss of Morningside is not only just a "couple of species" but also the ancient evolutionary lineages and a large amount of genetic diversity that is unique to Sri Lanka.

If people can be shifted from their historic dwellings to make way for developmental projects such as reservoirs and roads, why cannot they be shifted, if they have outstanding woes, to keep one of our most valuable natural heritages intact? Or can the villagers not be gainfully employed in nature based tourism as done in Western Sinharaja or in the Knuckles region (Pitawala Pathana-Illukkumbura- Deanstone areas)? Sustainable utilization of resources is fine, but as has already been pointed out, Morningside is not a sustainable resource in a traditional context; once lost, we would lose a fauna and a flora that has evolved in this area at least over the last 40 million years; hence, interference here should be kept to a minimal.

The current government of Sri Lanka has been given an overwhelming mandate by the people of Sri Lanka to make intelligent decisions. At this point, the will of the people of Sri Lanka is to conserve Morningside and Sinharaja forest as it is. Of course, a few villagers and politicians who will directly benefit from building a road or any other infrastructure development will always support such initiatives. But it is the duty of a responsible government to be discerning and do what is right, in determining among other things, what is best for Sri Lanka and its biodiversity. If this issue is handled properly, this will place us on a moral-ground from which we can advise other nations, even larger nations, to follow. However, we should not be an example for an environmental disaster, especially where a World Heritage Site is involved.

Here I have outlined the value of just one facet of the biodiversity of Morningside, and the threats that would ensue by the "development" of the land area between Sinharaja and Morningside. Many others also have already pointed out the value of the Morningside region. Now, conservation biologists, environmental activists, researchers, intellectuals and the public are keenly observing how the government will act in resolving this issue, as a substantial part of the island's treasure trove of her endemic flora and fauna will be decimated, if this area is not scientifically managed and made a conservation area.

Given the uniqueness and the impoverished nature of the organisms of the area, urgent steps should be taken not to degrade the habitat further, but to restore some of the degraded habitats so that the area available for the organisms of the region can be expanded, including the small gap (current footpath) that exists between Morningside and Sinharaja. The Government should not take this footpath as an excuse to divide Morningside area and Sinharaja. As we did as graduate students, many more students should be encouraged to do more research in the region, so that we better understand this ecosystem and interact with the people of the area so that we learn from each other. We pledge our support to any such initiative, so that this hotspot of endemism can be saved from destruction, while empowering the people of this region.

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