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**Case study:
South Nguru Mountains, Eastern Tanzania**

PLACE

The South Ngurus form part of the Eastern Arc Mountain Chain stretching from southern Kenya to southern Tanzania. The mountains are naturally covered in sub-montane and montane forests receiving moderate bi-modal rainfall (500mm-1200mm *per annum*). This stands in marked contrast to the surrounding *miombo* plains that receive as little as 700mm *per annum*¹. The difference helps explain why the mountains play such a critical role in the provision of drinking water to local communities and nearby urban centres, as well as water to major hydroelectric facilities in the region.

The Eastern Arc Chain, and the South Nguru Mountains in particular, are noteworthy for having some of the highest rates of biodiversity and endemism in the world.

PEOPLE

Local communities living in and around the South Nguru Mountains depend almost entirely on natural-resource based livelihoods. The Nguu tribe has the longest history in the region, but they have been pushed into mountainous areas poorly suited to sustainable agriculture by an influx of Chagga, Pare, and peoples in the lowlands. Though they suffer from diminishing returns, the Nguu still maintain a traditional mix of hunting, gathering and small-scale farming.

¹ L. L. L. Lulandala (2007), *Principal Ecological Issues with Significance in the Management and Restoration of Tanzanian Miombo Woodlands*, Sokoine University of Agriculture



Meanwhile, most of the Nguu, Pare and Chagga people rely on rain-fed farming. The Massai depend on raising cattle and goats – and, these days, some farming.

CHANGING CLIMATIC CONDITIONS

The Tanzania Forest Conservation Group (TFCG) and CARE have been working in the South Nguru Mountains since 2003 to improve local livelihoods and safeguard the forest ecosystem upon which they ultimately depend. In 2006, they undertook participatory research to understand what – if any – climatic changes were being experienced and how local living conditions were being affected.

The results were striking. Communities were unanimous in describing three pronounced trends:

- Temperatures are rising
- The onset of rainy and dry seasons has become much less predictable
- The frequency, intensity and duration of droughts – and floods – has greatly increased

Scientific data, though spotty, corroborates these conclusions.

CONSEQUENCES

These changes have a number of devastating consequences for local communities that were already some of the poorest in the world.



Less water

A growing number of villages have to contend with seasonal water shortages. In other words, the streams and rivers that 90% of all households depend on for washing, drinking (human as well as livestock) and cooking dry up. Though harmful to their health, households can cut back on water consumption. However, they cannot go without. As a result, women and children have to allocate more and more time each day looking for water; and this is time they could otherwise have spent in school or in productive activities.

Lower incomes and more hunger

Climate change is decimating local productivity – especially during the last decade. The most important factors are chronic heat and water stress. They reduce crop yields as well as livestock lactation and survival rates. What's worse, once rare crop failures are becoming commonplace. As a result, local incomes are drying up and people are increasingly dependent on food aid.

Migration

There is more moisture in and immediately adjacent to the remaining mountain forests than in the surrounding lowland plains. Therefore, the mountains are serving as a magnet drawing desperate immigrants. These immigrants include small-scale farmers and pastoralists searching. They are often men who have left their wives, children and elderly relatives behind. This is an extraordinarily stressful situation on everyone, and especially for women who are typically left with a crushing domestic workload.

Displacement and conflict

Some immigrants can find work in others' fields. However, most come to plant their own or herd livestock. This is resulting in the continuing displacement of the indigenous Nguu tribe and to increasingly violent conflict.

Tensions are especially high between resident farmers and immigrant pastoralists. Indeed, hungry herds frequently destroy fragile crops. When these cases are brought before local magistrates, pastoralists are stereotyped as aggressive invaders rather than victims of climatic changes beyond their control. The outcome is predictably punitive and can result in the *de facto* loss of the defendant's livelihood.

Other cases are settled outside of court through retaliatory ambushes, beatings, and even murder.

Forest destruction

Both farmers and pastoralists are responding to climate change by encroaching on the relatively moist forest reserves. This fuels and is fuelled by the illegal felling of trees (mostly by non-local businessmen).

As a result, forests are being whittled away from the edges, and most are now pock-marked with agricultural clearings. Community members acknowledge that this is leading to the wide scale loss of local biodiversity – including species that they rely upon for building houses, making tools, healing, and food during times of crisis.

ADAPTATION

Short-term coping strategies (such as the sale of household assets), which function reasonably well when dealing with climate variability, don't work in response to climate change. Nor is continuing forest encroachment a sustainable option. The most widespread adaptation strategy is the diversification of income-generating activities. Unfortunately, most of these are still natural-resource based. As a result, they remain highly sensitive to climatic conditions. Moreover, their widespread adoption is placing substantial stresses on the local environment.

TFCG and CARE are therefore collaborating with local authorities to:

- Introduce new, reduced risk farming techniques (e.g. agroforestry)
- Help households develop off-farm income generating activities that are less sensitive to climatic conditions
- Improve the management of forest resources so that they can be used when needed most.

Some of the greatest gains have come from investing in local adaptive capacity, including:

- Social capital
- Development of community based organisations
- Information, communication and education campaigns

Nonetheless, formidable obstacles to adaptation remain. Some of the most worrisome include discriminatory attitudes towards pastoralists, as well as traditional attitudes towards women which constrain their adaptive capacity.

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