Dynamics of vegetation environment and its relation to livestock herding under the mopane vegetation in Southern Africa

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Name: Koki Teshirogi

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<Research background and purpose>

The mopane vegetation that is distributed throughout Southern Africa has mostly been regarded as a pure stand of *Colophospermum mopane* (mopane). It has been reported that the ecological environment and vegetation structure differs even within the mopane vegetation but little research has been conducted in Northwestern Namibia. In this area, the local people depend on livestock herding that utilizes the mopane vegetation. This means that the structure and distribution of the mopane vegetation is deeply connected to their livelihoods. It is therefore essential to clarify the relationship between the characteristics of mopane vegetation and livestock herding by local people in order to examine the sustainable environmental use.

I commenced field research at a study site located near Khorixas in Northwestern Namibia in 2006. Past research has revealed that the distribution of the mopane vegetation at the study site is related to the geomorphologic environment. It has also been revealed that the relationship between vegetation structure and herding routes varied seasonally and that the difference in the routes depends on the vegetation distribution. However, the relationship between the characteristics of the distribution of mopane and the dynamics of the vegetation environment at the other site was not analyzed. In this research, I will conduct large-scale observation in Northwestern Namibia in order to clarify the characteristics of the mopane vegetation in arid land and its relationship to livestock herding.

Photo 1 Mopane vegetation landscape at my research site, Northwestern Namibia.

Photo 2 Mopane vegetation landscape in a drier area, Northwestern Namibia.

Photo 3 Dry mopane vegetation with a baobab tree, Northwestern Namibia.

<Fieldwork results and achievements>

In areas of relatively less rainfall, approximately 2-m-high mopane is sparsely distributed in the valley and in small depressions with a density of 75 trees per ha. This density clearly differed from that at my study site, which was 375 per ha. Additional tree species also varied by region. These were not distributed across the area but dominated locally instead. Baobab (*Adansonia digitata*), for example, was distributed locally but not seen in other areas.

In dry land areas with annual precipitation of less than 200 mm, the grass coverage rate was more than 70 percent. In this area, the local people herded mostly sheep, goat, and cattle. Most households had more sheep than goats. As local people did not herd sheep in humid areas, it was assumed that they chose the type of livestock depending on the characteristics of the vegetation because sheep grazed mostly on grass and goats mainly browsed shrubs.

Photo 4 Small ruminants herded on dry mopane vegetation in Northwestern Namibia.

<Implications and impacts on future research>

The next field research will be conducted in Angola. By comparing the result from the next survey in Angola with the present result, further insights into the dynamics of mopane vegetation will be identified.