

Project Update: July 2007

Over the last report we concentrated on acquisition of topographic maps and satellite imageries for elaboration on field base maps.

This report aims at narrating the first attempt of determining the elephants' distribution and the habitats diversity in the Chivuli plateau (Northern Mozambique Central Ecosystem).

Elephants' survey started on 23 March 2008 at the Chivuli plateau and 43 transects were placed on this geomorphological unit. Data on elephants is being identified with aid of field guide books, four local guiders and research assistants and recorded on GPS (Garmin 76) and field data sheet. Habitats diversity is being ensured by samples based on 23 quadrats of 1m x 1m and 31 of 10 m x 10 m.

Before a field survey, an informal interview was held with Chivuli stakeholders (agriculture district director, locality president and village regulos and nfumus) on the history of elephants in the area and the interview has been recorded by a digital camera (Panasonic 32 optical zoom)¹.

There is no doubt that elephants occur outside National Parks bionetwork. Three herbs of elephants ranging from 12-30 were identified in the Chivuli plateau community land. A crop raiding solitary bull was sighted near Nhamaropa village. Associated to a female elephant herb with caws of different ages; the buffalo (*Syncerus caffer*), eland (*Taurotragus oryx*), impala (*Aepyceros melampus*), bushpig (*Potamochoerus porcus*), porcupine (*Hystrix africaeaustialis*), warthog (*Phacochoerus aethiopicus*), etc were sighted using the area of Nhatunduluco small swamps system. This area is a corridor connector. The corridor is of more than 5 kilometers width and might be linking the elephants of Gorongosa National Park (in Mozambique), Zimbabwe, Zambia and Malawi.

Signals of elephants' presence and different utilization of habitats in the Chivuli plateau ranked from dungs (fresh and dry) (see figure 1, 2 and 3).



Figure 1: Fresh elephant dung © Da Silva, March 2008

It indicates that elephant do use the chivuli plateau as a feeding area. At the time of survey they were frequently feeding on amarula (*Sclerocarya birrea*) and baobab (*Adansonia digitata*) fruits (figure 2).

¹ These materials will be provided during our final report. The same for plants checklist, posters and impressive maps.



Adansonia digitata
fruits

Figure2: *Adansoniadigitata* © DaSilva, April2008

Dung density, under baobab trees, was somehow higher than under amarula trees, which indicates that a part of being used as food, it's also a source of shade, leisure (stripping) and watering during water critical times (e.g. dry season) or during breeding time (see figure 3).



Figure3: *Adansoniadigitata* offers leisure and water to elephants

Elephants were not only mostly feeding on amarula and baobab fruits, during the time of survey and before, but a careful examination of figure 4, it shows degraded dry dung with sorghum, millet and maize seeds.



Figure 4: Dry elephant dung © Da Silva, April 2008

Crops food preference, particularly by bull elephants is resulting on people sleeping on their farms and applying all possible techniques to pursue the pachyderms such as gun shooting. Although elephants can be viewed by indigenous people as a very big adversary; plausible ecological activity is being ensured by the species. They are dispersing seeds from one area to another. The abundance of amarula and some patches, along the rivers banks, of sorghum might confirm this hypothesis. In this respect indigenous people have to learn how they can full beneficiate from elephants' services: "change the disaster into success".

Elephants feeding preference varied not only spatially but also in time and habitat type. Elephants were chiefly feeding from 4 am to 10 pm and 4 pm to 7 pm. Daily activity feeding pattern was on the natural habitat while nocturnal pattern was on the manmade habitat.

During 10 am to 3 pm they used to water in some temporary rivers and swamps (figures 4, 5 and 6).



Figure 4: A temporary river near chivuli village it's used by elephants for watering © Da Silva, April 2008

Elephants access to water using digging technique. Because it takes time to find water, they sometimes prefer to find alternative watering sites, which in turn require long time distances walking. These areas are small temporary swamps where different wild fauna species scramble for water (see figure 5).



Figure 5: temporary swamp used by elephants for watering © Da Silva, April 2008

Apart of distance between feeding and watering place (transverse distance), the size of watering area is also of concern. It does not only contribute on the extent of grazing area and consequently the number of elephants using the area but also on the water availability and quality. When these water sites experience a severe dry see figure 6, bull elephant (particularly) prefer to continue walking while female with caw will avoid distances by caving *Adansonia digitata* for watering (see figure 3).



Figure 6: intensity of trampling by elephants' footprints on mud (vertisols) narrate the hydro-ecology role of small swamps © Da Silva, April 2008

Water, shade, leisure and food quality do not complete elephants' ecological requirements in the Chivuli plateau. They also search for minerals, security and resting areas.

Of course, on margins of Muera River in Nhamaropa village the elephants and other animals exhume for salt (see figure 7).



Figure7: Salting site© Da Silva, April 2008

Apart of salting, the same river is used as a shelter maybe due to the presence of dense riverine forest vegetation (e.g. *Kigelia africana*) and termites (see figure 8).



Figure 8: Shelter, resting and breeding site © Da Silva April 2008

Shelters' sites are not only used as a refugee but also as breeding sites maybe because they are rich on food, shade and water. In addition, they are less accessed by human. Ecological importance of termites ranged from rubbing, stripping and a starter for getting up particularly young elephants.

Although the Chivuli plateau is being intensively used by elephants and other wild fauna, the same species are exposed to variety of threats such as:

- a) an ever human growing population (see figure 9).



Figure 9: human population densities dictate the future of elephants in the plateau © Da Silva, April 2008

b) infrastructure development (see figure 10)



Figure 10: former watering and grazing area by elephants © Da Silva, April 2008

c) Trees cutting for wood market (figure 11).



Figure 11: habitat extension reduces with trees removal © Da Silva, April 2008

d) Illegal hunting (poaching)

Figure 12: poaching was banned by biodiversity convention but it persists in some communities © Da Silva April 2008



Chivuli plateau survey did not only show the distribution of elephants, diversity of habitats used by the species but also different activities taking place in the ecosystem.

Apart of human increasing on elephants' corridor; infrastructure development on former grazing and watering places; trees cutting on habitats used for feeding, breeding and security; illegal hunting that directly affect the number of species; uncontrolled burning perhaps is the most determinant threat affecting the conservation of elephants in the Chivuli plateau. The extent of fire is being identified by means of Landsat ETM+ satellite imagery but further research on this matter will be needed. Moreover, the extent and ecological importance of *Adansonia digitata* need a particular attention in the Chivuli Plateau. Future conservation project in this area also need to address a spatial variation of crop-raiding by elephant and its implications on food security and cash income. Apart of this, indigenous schemes of water conservation and salt generation need to be understood, improved and implemented in order to minimize the observed large home range. Short home range might also be achieved through a design of patrols routes on habitats frequently used by elephants.

However, our next report will be based on the Macossa Plateau.

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