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Final Report

Let's go *djumbai*! Primate ecology and conservation education with the children of Cantanhez National Park, Guinea-Bissau

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Introduction

The Cantanhez National Park (hereafter CNP), a protected area of 1,067 km^2, is an agroforest mosaic and a biodiversity hotspot with 8 species of primates and the only intact coastal forest in the country. It is also home to more than 25,000 people living in around 160 villages, with almost half of the population under the age of 14.

The primates of the CNP are currently facing worrying problems, mainly due to the conversion of their natural habitats, including blocks of protected forest, into shifting cultivation, and hunting. These threats mainly affect the colobus monkey population, which are declining and becoming isolated within the park due to their dependence on high-quality forests for survival. Both colobines, namely king colobus (*Colobus polykomos*) and the Temminck's red colobus (*Piliocolobus badius temminckii*) have been listed as Endangered worldwide (IBAP, 2014; Gonedelé et al, 2020; Minhós et al, 2020).

In the recent past, illegal hunting has also had a negative impact on other primates, notably the Guinea baboon, considerably reducing their population and forcing them to move to small, undisturbed areas (mainly forest blocks and mangrove margins) (Bersacola & Hockings, 2023). Conflicts between humans and primates are increasing, particularly regarding western chimpanzees. Deforestation has reduced and continues to reduce the primates' preferred habitat, as well as the wild resources they feed on, forcing them to use anthropogenic habitats and resources (agricultural fields, village orchards).

Chimpanzee attacks on people have been recorded in southern Guinea-Bissau, including one in the CNP involving a child who was picking wild fruit in a small forest. The recent discovery of leprosy circulating in chimpanzees in CNP highlights the transmission of zoonotic diseases as a threat to the coexistence of humans and primates (Bersacola & Hockings, 2023; Hockings et al, 2021; Andrade, 2002).

Environmental education can be understood as a means of intervening in environmental problems through educational programmes that go beyond formal education (Borges et al, 2010). It can play a fundamental role in sensitising the community to the need to conserve environmental resources and in promoting good practices and a change of attitude to safeguard critically endangered species.

With this in mind, we implemented **Vamos *Djumbai*! -** an environmental education project for the conservation of non-human primates, aimed at children aged 7 to 14 living in the PNC.

Methodology

We carried out the *djumbai* in April 2024. We selected 18 villages to carry out the djumbai sessions, however, some locations included children from neighbouring villages, totalling 20 villages involved. The villages were: Cambeque, Hafia Guiledje, Quebo Sutuba, Medjo, Faro Sadjuma, Iemberem casa nova and Gã fula, Iemberem missira, Cadique Nalu, Cadique Yala, Cadique Mbitna, Cadique Maila, Caiquene, Lautchande, Madina, Catomboi/Tubandim, Farim, Canamina and Cabante. We involved school-age children and children who are not attending formal school. In each village, the children were selected with the help of local collaborators, who visited the homes, explained the purpose of the educational session and asked for the consent of the parents (at least one parent or guardian). Once selected, the children were divided into two age groups in each village, i.e. a group of children aged between 7 and 10 and a group of children aged between 11 and 14. These two groups had separate *djumbai* sessions, but the content of the *djumbai* was the same. The *djumbai* sessions took place mainly at the weekend, with some sessions taking place on weekdays during holiday. Each session lasted had a animator (A Sanhá) who asked the children questions and provided information, and another researcher who wrote down the children's answers for evaluation. Each session lasted approximately 1.5 hours. We used Bissau-Guinean Creole as it is the most widely spoken language in Guinea-Bissau. However, children sometimes use their local language for the names of animal and plant species and other elements. We therefore sought the help of a local collaborator for the translation.

Results

In total, we held 36 *djumbai* sessions with 723 children in 18 villages, 400 of them aged between 7 and 10 and 323 aged between 11 and 14.

Each session had two parts, namely *djumbai* and post-*djumbai*. During the *djumbai* session we used a large, printed canvas depicting one of the reserved forests of CNP as a

base to build a 'healthy ecosystem' with the use of cut-out images of all primate species present in CNP, other local fauna (14 species), and wild fruits (10 species).

During the *djumbai* session, before providing the children with information we evaluated their knowledge by asking planned questions over the course of the session. The questions had two functions: (i) to measure their knowledge and (ii) to animate the session and make it interactive. We recorded the children's answers both as a group (consensus) and individually (e.g., counting how many raised their hands, provided at least one answer, etc). The children's answers were measured using open-ended, multiple-choice YES/NO, agree or disagree questions.

The *djumbai* session opened with: "Is protecting the forest good? If yes or no, why?" For example, 7- to 11-year-olds from Lautchande village responded by saying "YES" in chorus (group consensus), and one of the children replied that the forest is where the animals live (1 individual child provided an open-ended question answer). This question provided the opportunity to highlight important elements that the forest provides for mankind, such as food, medicine, fuel (firewood), shade, the oxygen we breathe, the rain we receive, regulating the temperature, purifying the water we drink, protecting us from strong winds and so on.

We also asked the children other questions, such as: "Who knows chimpanzees please raise their arm". With the answers to "Where do chimpanzees like to live, at home or in the forest?", and "What do chimpanzees eat?" we began depicting the ecosystem with icons (chimpanzees, wild fruit) asking children to choose their placement within the canvas. The question "What other behaviour chimpanzees have within their group?" provided the opportunity to describe similarities between chimpanzees and humans in their social behaviours and life history, such as caring for the offspring for a long time, teaching/learning how to construct 'their own bed' (a nest), etc.

Another question was "Are chimpanzees abundant in the world?" In most cases, children generally perceived that chimpanzees are globally abundant. This perception may stem from their frequent encounters with chimpanzees in Cantanhez, where they visit homes and agricultural fields in search of fruit, leading children to assume they are abundant worldwide. However, we informed them that the chimpanzees they believed to be abundant are not globally so; they are, in fact, an endangered species. We also emphasised that Cantanhez is special in this regard, as humans do not hunt chimpanzees.

"How many primate species are there in Cantanhez?" and "Which species of monkeys are rarest in Cantanhez?" The last question was a multiple choice between three primate options, green monkey, Campbell's monkey and Temminck's red colobus, in which we posted pictures on the wall asking the children to stand up and go to one of these primates that they considered to be the rarest in Cantanhez. However, we saw that the children were generally unaware of the state of conservation of the colobus monkeys as the rarest species in Cantanhez. In addition to describing their status in Cantanhez, we also

explained (to the older kids' groups) that Temminck's red colobus also have restricted territories worldwide and can be found in four countries only: Guinea-Bissau, Guinea-Conakry, Senegal and Gambia.

In general, the planned structured questions enabled us to reinforce or increase the children's knowledge about the ecology of different primate species, the importance of conserving wildlife, and how each species is responsible for maintaining a healthy forest, e.g., by dispersing the seeds of various fruits that they eat wherever they go, by controlling the population of snakes and rodents. The final canvas incorporated all the elements described by the children and the animator during the *djumbai*, allowing the children to visualize a healthy ecosystem.

For the post-*djumbai*, which we ran after a short pause, we recapped the key topics covered to test the children's change in knowledge. In the initial sessions, we attempted to repeat all the questions asked during the *djumbai*, but the children were often too tired by the end. To overcome this, we decided to limit the number of questions during the post-*djumbai* to maintain their attention. We also tried asking the children to draw wild animals they knew before *djumbai* and post-*djumbai*, but this approach had a similar issue—it took too long, and their attention waned. Therefore, we opted to focus on building the ecosystem on the canvas instead.

Preliminary evaluation results

The analysis of the data collected for the evaluation is underway. Here we present some preliminary results of the evaluation (10 out of 36 groups considered), according to the following themes/questions: 1) importance of protecting the forest, 2) conservation status of chimpanzees in the world, 3) ecology of chimpanzees.

Seven out of 10 groups showed an increased understanding of why the forest should be protected after the *djumbai*.

Nine out of 10 groups showed an increase in awareness of the fact that chimpanzees are not globally abundant, despite their presence in Cantanhez.

Similarly, during the post-*djumbai* period, 7 out of 10 groups showed a higher level of knowledge about the chimpanzee diet (including cultivated and wild foods).

Conclusion

In conclusion, the *djumbai* activity was very satisfactory and the children enjoyed it very much. Most of the children made the most of it in terms of understanding the message being conveyed. We recorded two equally difficult moments in keeping the children's attention during the *djumbai*, namely an emotional moment at the beginning of the activity and an exhausting moment at the end of the activity. However, we managed to mobilise them in these two moments to keep their attention. We recommend extending this *djumbai* activity to more villages in and around the park and include these messages within the formal education curriculum.

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