How agriculture can help conservation: a field perspective from West Africa

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The Upper Guinean rainforest used to extend throughout West Africa, but significant deforestation has taken place in recent years, mainly as a result of land use changes to commercial and subsistence agriculture. Liberia has the largest remaining tract of forest in the region and estimates indicate that 33% of forest cover remains. Fauna & Flora International (FFI) has been working to conserve an important Upper Guinean transboundary forest landscape, comprising a (proposed) protected area in Wonegizi Liberia, and a Man and Biosphere reserve in Ziama, Guinea. This forest is extremely important within the landscape for enabling movement of key species, such as the African forest elephant; previous surveys in the area have also indicated the presence of Pygmy hippos and chimpanzees. The species in this forest are suffering declines, with the most recent census of forest elephants in transboundary forest indicating a population decline from an estimated 200 in 2006 to 16 individuals. FFI has been working to reduce pressure on the forests by introducing conservation agriculture practices as a way of improving yields on existing farmland and as a means of bringing degraded land back into production, with the objective of limiting further encroachment into protected forest areas. This article will give a summary of the similar but unique situations in Liberia and Guinea.



Figure 1 Preparation of farmland through burrning in Wonegizi Proposed Protected Area

In Liberia, FFI has been working on agriculture under a Reducing Emissions from Degradation and Deforestation (REDD+) project. FFI is working with 13 communities in and around Wonegizi Proposed Protected Area. Currently communities in the area prepare their farmland by cutting an area of all vegetation and burning the residues. Burning is thought to suppress some weed seeds. The top layer of ash from burning then increases the pH of the ferrous African soil, allowing for increased nutrient uptake by the crop plants. However, after one or two seasons, (depending on the crop), the soil is once again depleted. This depletion, as well as the build-up of weeds, bacteria, fungus and pests in the soil, encourages the farmers to shift their agriculture to a new piece of land to let the depleted area recover. Over the years, as populations increase, this pattern of shifting agriculture in Wonegizi has led to farm plots slowly creeping further into the forest, leading to a mosaic pattern of deforestation. In order for communities to access carbon payments in the future, deforestation rates need to decrease and addressing shifting agriculture is seen as a key strategy to help the communities reach that goal.

From discussions with the communities, it is thought that planting of vegetables and peanuts are the main drivers for the clearance of ‘old bush’. In order to try to reduce the deforestation

from shifting agriculture, FFI has worked with a local partner, Skills and Agricultural Development Service (SADS), to introduce conservation agriculture practices to the area. The target has been to provide intensive training on conservation agriculture to one person per household, for a total of 1300 households reached. Conservation agriculture is taught through the delivery of farmer field schools (FFS). Each school undertakes five hours of training per week over an 18 month period, giving farmers the chance to train through two complete growing seasons. The training is delivered through extension agents, and disseminated through lead farmers and informal female labour groups (Koos).

Currently, 24 FFS run every week across the 13 communities, totalling 512 participants (347 women and 310 men). Within the FFS, crops are grown under the Participatory Technology Development (PTD) method, whereby conservation agriculture plots are compared to plots using traditional (local) agriculture methods, and plots planted using conventional inputs and techniques. The crops that are grown are chosen by the communities and largely consist of rice, okra, eddo, peanut, chilli pepper and cowpeas. Conservation agriculture techniques that have been introduced include no till, mulching, brushing, site selection, and field layout. Initial surveys of adoption from the 2017 FFS indicate that of 142 graduates surveyed, 97% said they would continue to use conservation agriculture on their own farms. 63 farmers stated they had harvested crops under conservation agriculture, and reported yields to be higher than those under traditional agriculture. However these are initial farmer reported survey results, and it will be important to follow up and verify these results.

Across the border in Guinea, Ziama Man and Biosphere (MAB) Reserve exists to ensure the viability of Guinea's last population of forest elephants and other key species. This transboundary forest landscape contains areas of permanent wetland which the Guinean communities call 'bas-fonds'. These areas of humid and fertile soil are used by local farmers to grow crops, mainly rice and market vegetables. This practice was once permitted by Centre Forestier de N'Zérékoré (CFZ), who managed the Ziama MAB, at regulated levels, but increasing demand for land has led to illegal clearing of additional areas inside the core forest zone; current use of bas-fonds far exceeds that which was originally legally permitted. CFZ now wish to halt all agricultural activity within core zones as per the standard MAB regulations. Cultivation in the bas-fonds has interrupted about 25% of the corridors used by the forest elephant population to move about. Elephants are increasingly using bas-fonds crops as a food source, leading to human-wildlife conflict (HWC) and retaliatory killing. Continued use and expansion of bas-fonds is considered the most significant threat to the integrity of Ziama forest ecosystem. Using bas-fonds requires farmers to travel long distances (up to 10kms) within the forest, with farmers often camping overnight, providing opportunities for poaching and illegal collection of forest products. Farmers have stated they would prefer not to travel to bas-fonds due to the challenging terrain and risk of dangerous wildlife encounters. It is mainly female farmers who regularly tend the bas-fond crops.

FFI believes that in order for the Ziama MAB to remain an intact and viable protected area long into the future, the communities living in and around it need to feel the benefits. To this end, FFI has been supporting the communities and CFZ to slowly transition out of farming in the core zone by incentivising farmers to re-establish crops on formerly marginal land close to the villages, using improved agricultural and land restoration techniques. So far, 50% of bas-fonds users located in 4 villages are receiving support in sustainable agriculture techniques to help them transition out of the MAB. 368 farmers have been trained so far in activities including use of leguminous crops such as mucuna, cowpea and moringa for land restoration. The current method for clearing land within the bas-fonds is heavy use of chemical herbicides, which is illegal in the MAB. FFI has been working to discourage herbicide use in the MAB, and to provide training on safe agrochemical use.



Figure 2 Farming encroachment into Wonegizi Proposed Protected Area (Josh Kempinski)

Both projects have a number of challenges to their implementation. Firstly, agricultural inputs represents a challenge in both countries. On the Liberian side, farmers have very limited or no access to inputs, which means pests are a huge problem and have a significant impact on yield. Whereas in Guinea, overuse of chemicals is threatening the integrity of the MAB. Both project sites are extremely remote, and access to markets is challenging. However on the Guinean side there is a tarmac road to the regional town. Despite working with the original estimate of 50% of bas –fonds users, there is a need to scale up the support in Guinea to reach all bas-fonds users. Equity of support and assistance in transitioning out of the bas-fonds is essential. Furthermore, FFI has been working to address the human wildlife conflict with elephants, and has been trialling the development of an agricultural buffer as a barrier to elephant raiding in the villages around Ziama MAB Reserve.

In the above two examples, sustainable agriculture can be used as a potential solution to limit encroachment into key forest habitats whilst at the same time aiming to improve livelihoods and yields on existing agricultural land. The work could be framed within the concept of land sparing as we are working to improve yields in order to conserve habitat. However given the local contexts and the advantage that lower impact agriculture can deliver to buffer zones around protected areas, our work in this case is more closely aligned with the concept of ecological intensification using biodiversity and ecosystem services to increase yields on farmland.



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