



Building Resilient Landscapes and Livelihoods in Burkina Faso's Shea Parklands

The Shea Parklands

Shea parklands, a traditional form of agroforestry in West Africa, extend across 23 Sahelian countries in a belt from Senegal to South Sudan. The parklands consist of cultivated fields where selected trees and shrubs have been retained among annual crops including cotton, millet and sorghum. The most frequent trees retained are often shea.

The parklands ecosystem provides multiple benefits to people, including forage and shelter for livestock, firewood, building materials and traditional medicines. The presence of trees helps to bind the soil, reducing organic matter loss, and leguminous tree species in the parklands including acacia and African locust bean improve soil fertility. They also support significant populations of insect and bird species that provide pollination and pest control functions.

The edible shea fruit matures into a nut which contains a kernel that can be processed into an important edible oil and butter, rich in vitamins, minerals and fats. Shea contributes to the rural diet of an estimated 45 million people, as well as being traded locally for consumption in urban areas. Production and sale of shea kernels and butter is dominated

by an estimated 18 million rural women collectors, who have few other sources of cash income to support the well-being of their family, and the education of their children.

Shea kernels are also an important internationally-traded commodity primarily for the food industry, and to a lesser extent, (some 10% of the shea value chain), goes into cosmetics. The industry in West Africa is rapidly expanding, and demand for shea butter has nearly doubled in the past 20 years.

Although shea parklands are an important habitat across West Africa, agricultural expansion and intensification have resulted in changing practices in the parklands¹. Increased demand for land under active cultivation has led to more land clearance, shorter fallow periods and smaller fallow areas in the parkland landscape. With less time and space for natural regeneration to occur, the trees and shrubs in the shea parklands have become less diverse and less abundant. Together, expansion and intensification of agriculture have led to loss of both habitat diversity and plant species diversity, and consequent reduction in the benefits derived from the parklands, including from pollination.

¹This U.K government Darwin Initiative funded project implemented between 2016 and 2019 researched both the impact of habitat diversity upon pollination services in shea parklands of southern Burkina Faso, and also how farmer led agro-ecological interventions, referred to as the 'Trees Bees and Birds strategy' can increase on farm biodiversity, and improve parkland habitat at landscape level. The views expressed in this briefing paper are from the project team (23-017).



Why is pollination important to these ecosystems?

Almost all wild flowering plant species in the tropics depend, at least in part, on the transfer of pollen by animals. More than three quarters of our main global food crops rely in part on animal pollination for yield and/or quality. The recent IPBES report on pollinators found that wild pollinators are facing declines globally. The key drivers of pollinator declines are complex and include intensive agricultural management and pesticide use, land use change, and climate change. Crucially, West Africa suffers from significant data gaps reducing the ability to monitor pollinator dynamics or accurately assess the extent of any consequences.

Shea is heavily dependent on insect pollination for fruiting, and kernel production, from which shea butter is extracted. Pollination is therefore critical to shea butter production. The most important pollinators for shea are bee species, especially the honey bee, *Apis mellifera*, and stingless bees in the genus *Hypotrigena*.

Pollinators in shea parklands also support the production of a range of other nutritious fruits such as African locust bean and baobab, and nitrogen-fixating plants improving soil conditions.

Whilst demand for shea continues to increase, shea yields have declined by 40% in the last 20 years with severe implications for local food security and livelihoods. This decline is thought to be linked to parkland degradation due to changing management practices and resultant pollinator loss.

There is an urgent need to address information gaps around the extent to which habitat degradation through reduced species and habitat diversity and abundance is affecting pollination and shea fruit production, and to determine management and other solutions to ensure a sustainable future for shea parklands and the people that depend on them.



Insect pollination improves yield of shea in the agroforestry parklands of West Africa

Key Findings and Recommendations based on this study

- The shea trees produced more fruit when their flowers were hand-pollinated than when left open to natural pollination, indicating that fruit production was limited by lack of pollination.
- Sites with less diversity of tree and shrub species were more limited due to lack of pollination. We infer that shea yields benefit from retention of a diverse range of trees and shrubs in the parklands because they support more pollinators.
- Incorporation of a diverse range of tree and shrub species within shea parklands is likely to support production of fruits and nuts of shea, and of other shrubs and trees. In many cases natural regeneration from seed banks may be enough to restore diversity within the parklands.
- The most effective method for regeneration of woody species in shea parklands is through fallow periods of 15 years, which can be difficult because it removes valuable land from cultivation. Enriching the fallows with species of commercial value and promoting the sustainable exploitation of non-timber forest products, apiculture, firewood coppicing and charcoal burning have successfully supported extended fallowing, in the Democratic Republic of Congo and the Ivory Coast (Nsimundele Nkondo et al. 2010; R. Peltier et al. 1995; Régis Peltier et al. 2010), and may be suitable for adaptation in Burkina Faso.
- There are situations where tree planting is likely to be appropriate, and consideration should be given to plant native species which are capable of supporting pollinating species, and other biodiversity, including resident and migrant birds.



- Effective Parkland Stakeholder Engagement: the success of management practices to increase tree and shrub diversity will depend heavily on the local people who use the parklands, and other industries which operate in the landscape, including mining. In addition to village chiefs, shea kernel producers and farmers, nomadic pastoralists, charcoal burners and honey hunters should also be engaged.

Trees, Bees and Birds

- In line with our findings of higher plant diversity improving pollination services, The Trees Bees and Birds strategy promotes different techniques to enable farmers to increase 'levels of nature', or 'mainstream biodiversity' on-farm. These include: allowing natural regeneration of diverse trees and shrubs, planting multi benefit native tree species (good for people, livestock, insects and birds); replacing agro-chemical inputs with locally produced mulch and compost; and introducing apiculture for pollination and food/income.
- Agricultural Extension Services are an effective way to deliver practical site support to resource poor farmers, and mainstream biodiversity. This project has supported partner-led training in all TBB activities and techniques, to more than 1595 local farmers around Kaboré Tambi National Park, of whom 36% are women. These support services have been effectively rolled out through direct training and implementation, and indirectly through ambassadors, who have gone on to train others, around interventions to enhance on-farm plant diversity.
- Collectively, the TBB strategy contributes to improved food security and reduced vulnerability through diversified livelihoods and gender empowerment (Sustainable Development Goals 2 and 5), and in shaping more diverse, resilient, and productive landscapes (SDGs 13 and 15). This work demonstrates the potential for Ecosystem Restoration for enhanced pollination services, to be a core component of successful development aid strategy.

Recommendations for In Country Action and Development Assistance through CBD National Focal Points, and Agriculture and Environment Ministries

The shea parklands are a transboundary habitat that stretch across large parts of West Africa. To truly build resilient landscape mosaics and sustainable livelihoods, the following related recommendations should be considered.

Recommendations based on this research

Incorporation of a diverse range of tree and shrub species within shea parklands supports production of shea fruits and nuts and yields of other shrubs and trees. In many cases natural regeneration from the seed bank within fields may be enough to restore diversity. Where tree planting is appropriate, consideration should be given to the species planted so that they are capable of supporting pollinating species. Supporting the maintenance of the fallowing system by sustainable exploitation of fallows for NTFP (potentially including beekeeping), coppicing for firewood, and potentially improvement by facilitating the regeneration of valuable species within fallows. The success of management practices to increase tree and shrub diversity will depend heavily on the diverse stakeholders across the landscape.



Wider recommendations linked to this research

Pollinators: The finding of this study supports the recommendations made by the IPBES Pollinators, Pollination, and Food Production assessment report². Within Burkina Faso and the wider shea belt we encourage the implementation of the following recommendations from the assessment in particular:

- Maintaining or creating greater plant diversity in agricultural landscapes for pollinators;
- Supporting traditional practices that manage habitat mosaics, and coproduction between science and local knowledge;
- Education and exchange of knowledge among farmers, scientists, industry, communities, and the public.

Ecosystem Restoration: Retaining a diverse array of woody species within cultivated areas in shea parklands is likely to support fruit production by releasing shea trees from pollen limitation. Traditional management of the shea parklands as multifunctional ecosystems, increases their capacity to support a wide range of ecosystem services and general biodiversity. Habitat management approaches which encourage diversity across the landscape should be considered throughout the shea belt, to help deliver on the Bonn Challenge, and the recently declared UN Decade on Ecosystem Restoration.

Food Security: Diversified agro-forestry practices which mainstream diversity in farming systems, both reduce vulnerability and strengthen rural livelihoods. They also shape resilient landscapes, demonstrating the importance of ecosystem restoration as an integral component in delivering on the UN Sustainable Development Goals.

Capacity building: Local scientific expertise in ‘beneficial insects and pollinators in particular’ is lacking in Burkina Faso. Training to increase local NGO and academic capacity in methods for studying pollination ecology and identifying pollinating insects, would improve knowledge around the status of West African pollinators. Development of links between educational institutions in West Africa and European universities with strong pollination ecology research basis, would be a positive move.

² www.ipbes.net/assessment-reports/pollinators

National Biodiversity Strategy: The National Biodiversity Strategy and Action Plan for Burkina Faso calls for better analysis of production systems and their benefits in particular for Shea systems. Suggested areas for further research on a larger scale include:

- How much shea should be harvested? Shea may be a keystone fruit as it provides for bats, birds, mammals and insects as well as humans. With increasing demand from international traders, a sage limit for exploitation that does not destabilise the local diet or ecological networks should be established to avoid over-exploitation.
- Identification of flora which supports shea pollinators outside of shea flowering season, to ensure year-round provision of pollinator resources.
- Diversity of pollinators in shea parklands in comparison to natural areas? Movement of pollinators from natural areas to shea parklands, or a different suite of species found in the parklands?
- How much does tree and shrub diversity, and amount of fallow land, impact on pollinator diversity or composition?

Biodiversity Mainstreaming

This project is a glowing example of the potential mechanisms and benefits for successful biodiversity mainstreaming. It supports the implementation of the Cancun Declaration³ under the CBD which calls for “diversified agro-ecological systems, promotion of the use of biodiversity in agricultural systems, and effective management and conservation of pollinators”. We warmly encourage other countries within West Africa to have a stronger voice in demonstrating how such initiatives and interventions can have positive impacts for mainstreaming biodiversity and restoring ecosystems. Such projects can help champion integrated, local to global solutions, in line with the CBD and towards the implementation of the post-2020 agenda.

Satoyama Initiative: In its NBSAP Burkina Faso commits to contribute to the Satoyama Initiative⁴ which is a partnership formed around consolidating expertise on socio-ecological production landscapes and seascapes. The TBB strategy developed with communities during this applied research project could be used to exemplify how practical, farmer led innovation can provide a synergetic solution for nature and people within a productive landscape.

Abuja declaration: Applying the findings of this work also demonstrates a way for Burkina Faso to implement the recommendations under the “Abuja Declaration on Sustainable Land Use for People and Biodiversity including



migratory birds in West Africa (Nov 2016)” of the Convention on Migratory Species (CMS). Recommendation is particularly pertinent and commits to “integrate sustainable land management practices and approaches (particularly around native tree restoration) that will support birds and people in West Africa”.

The Importance of Transboundary Cooperation

We call for transboundary cooperation, whereby Burkina Faso should use this research to work with neighbouring shea producing countries to ensure an integrated, sustainable, landscape-scale approach. The potential for this approach to contribute to multiple international agreements should encourage CBD National Focal Points to work together, to implement the findings and showcase how West Africa can be a leading light on mainstreaming biodiversity into agricultural systems.

To date much sectoral investment has been private. National and transnational funding opportunities also exist to scale up the necessary interventions across the shea parkland, such as the Global Environment Facility. National focal points working with relevant stakeholders can identify how financing mechanisms, including REDD+, could be used to scale up sustainable practices across the shea belt.

This approach to shea management also contributes to the transboundary Action Plan for Migratory Land Birds in the African-Eurasian Region⁵ (AEMLAP) under the CMS. We encourage further implementation of the commitments to ‘promote the importance of sustainable land use for migratory birds, with relevant UN agencies and other international institutions and to seek opportunities for collaborative action to encourage sustainable land use for migratory species and people’ ■

³ <https://www.cbd.int/cop/cop-13/hls/cancun%20declaration-en.pdf>

⁴ <https://satoyama-initiative.org/>

⁵ Decision 12.22 and 12.24 and 12.25

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