



Transformative and inclusive shea
(*Vitellaria paradoxa* Gaern. f)
landscape restoration for improved
livelihoods in West and Central Africa



1. Introduction: Rationale for the Species

Background and context

Vitellaria paradoxa, known as shea tree or karité, is one of the most important multi-purpose tree species providing food, income and ecosystem services in West and Central Africa (WCA) (Bayala et al. 2014; Seghieri 2019). The *Vitellaria paradoxa* tree grows naturally in the dry savannah belt on farmlands, fallow lands and other woodlands where oil palm cannot grow due to low rainfall. Shea trees are preserved during land clearance for farming and form part of the agroforestry parklands, the main agricultural systems in the area where shea grows (Boffa 2015; Bonkounkou 1987; Seghieri 2019).

The shea sector has the potential to generate wealth and employment for many people in West and Central Africa (Pouliot 2012) and it contributes to preserving the agroforestry parklands, the most widespread agricultural system in the Sahel. The fruit pulp is an important local nutritional resource, widely eaten by adults and children. It is rich in vitamins and minerals (ascorbic acid, iron and calcium) and constitutes a source of protein and carbohydrates during the annual 'hungry season' (Maranz et al. 2004). Its seeds are rich in the mixture of edible oils and fats known as shea butter, which is used for cooking as well as for cosmetic and medicinal application (Lovett 2015; Maranz et al. 2004; Teklehaimanot 2004). Caterpillars produced from shea trees are high in protein and eaten across the West Africa region (Anvo et al. 2016; Payne et al. 2019).

Most of the collected shea nuts are processed into a butter for home consumption and the local market. Moreover, there is a growing international market for shea butter for its use in chocolate as well as pharmaceutical and cosmetic industries. This international market is providing more than €175 million per year to West African rural communities. About 400,000 tonnes of shea nuts were exported from Africa in 2018 (BCEAO). Shea butter is a useful cocoa butter substitute because it has a similar melting point (32–45°C) and high amounts of di-stearin (30%) and some stearo-palmitine (6.5%) which make it blend with cocoa butter without altering flow properties. Cosmetic and pharmaceutical applications form a relatively small part of shea production but present a fast-growing and potentially high value market niche for shea nuts and shea butter (Allal et al. 2013; Maranz et al. 2004).

As many tree species in West and Central Africa, shea trees contribute to building socio-ecological resilience by providing food (pulp and caterpillars) for balanced diets, income, and wood energy to humans, fodder to livestock. They also sequester carbon above ground and in the soil, by protecting land against degradation, regulating runoff and the micro-climate, and conserving biodiversity (Allal

et al. 2013; Bayala et al. 2006; 2014; Félix et al. 2018).

However, there are many challenges affecting the entire value chain. These include inadequate processing and handling, poor storage facilities, the species still not being fully domesticated, inappropriate conservation of genetic diversity, unavailability of reliable national/local statistics and degradation of its resource base. Shea trees remain largely naturally regenerated with limited and rare plantations (Kabiru, Adeloye and Adegbelem 2017; Bayala et al. 2009; Lovett 2004; Ræbild et al. 2012). As a tree crop, shea is relatively resilient to a changing climate and is beneficial to the overall resilience of the ecosystem – through maintaining soil fertility and biodiversity of flora and fauna. Nonetheless, the shea tree is considered a vulnerable species, largely at risk from human practices (collection of nuts, bush fire, use of the species for firewood, etc.). Measures such as conserving soil and water through new technologies are being adopted to improve the conservation and the management of shea tree stands.

Developing tree value chains that take into consideration tree product resources will ineludibly enhance food and nutritional security while reducing poverty of many households living in the West and Central Africa region, where 60 to 80% of the population depend primarily on natural resources for their livelihood. Such an approach will also restore the health of the ecosystems, making them more resilient.

Problem Analysis

Shea is important for the West African economy, both as a commodity for export, and in providing subsistence for local communities. It generates wealth and employment for a large number of people, especially women and the youth (Lovett et al., 2013; Pouliot 2012; Seghieri 2019). However, this can be optimised by addressing the many problems still affecting the entire value chain of the shea sector with various stakeholders playing different roles at various stages. These stakeholders include village collectors and post-harvest processors of kernels, local buyers, large-scale exporters of shea kernel and processors, small-scale entrepreneurs formulating cosmetics in Africa, external entrepreneurs or companies formulating cosmetics and edible products. The key challenges impeding the development of shea value chain development include inadequate knowledge on post-harvest handling, poor storage facilities, inadequate processing and packaging skills and facilities, a lack of reliable statistics and a lack of improved plant materials (Boffa 2015; Kabiru et al. 2017; Lovett 2004). The natural regeneration is impeded by disappearing fallows and excessive ex-

exploitation of the fruit, bushfire, agricultural practices and roaming livestock (Ræbild et al. 2012; Aleza et al. 2015). With a decrease or absence of fallowing, there is a need to engage in vigorous restoration actions to ensure the regeneration of shea trees in West Africa. The parklands are degraded with ageing trees which are also attacked by pests and parasites (Augusseau et al. 2006; Bayala et al. 2008; Brandt et al. 2018). In addition, the fact that shea is collected from the wild (agroforestry parklands, fallows and forests), and that it takes on average more than 10 years to start fruiting, constitute a serious bottleneck for the development of its value chain. Furthermore, the indiscriminating cutting down of shea trees for timber, firewood and charcoal threatens the sustain-

ability of this species (IUCN red list) and constrains the expansion of its value chain. Therefore, the core problem to be addressed by this shea value chain programme is the decline of the shea tree population across WCA. Addressing this issue appears as a prerequisite for the development of a sustainable sector. Indeed, a decline in the shea population is expected to lead to an overall degradation of vegetation cover, increased soil erosion, decreasing crop yields and loss of income for the most vulnerable groups, including women and children. Various driving factors of resource degradation, including 1) socio-economic, 2) institutional and policy, 3) behavioural and cultural, as well as 4) environmental, are identified (Figure 1).

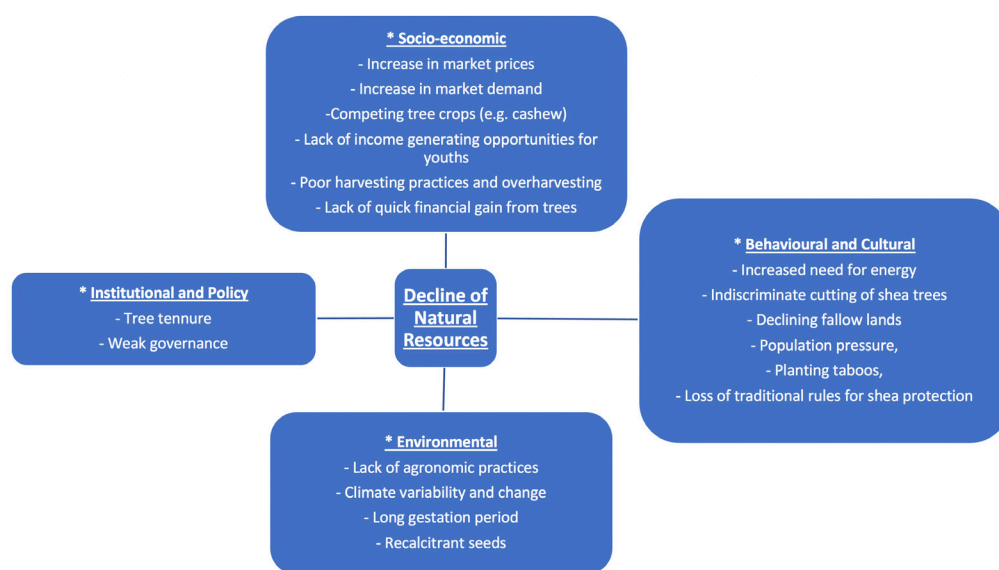


Figure 1. Various factors driving the decline of shea (*Vitellaria paradoxa*) natural resources in West and Central Africa (Source: Group work in Grand Bassam)

Scope and Context

The increasing demand for chocolaterie, cosmetical and pharmaceutical products is a great opportunity to improve shea production in WCA. Many companies from various countries, including AAK6 from the Scandinavian countries, LODERS CROKLAAN from the Netherlands, 3F from India and ADM from Germany, are interested in buying good quality nuts or butter. Some international institutions and programmes such as the World Bank and the Great Green Wall are interested in improving shea value chains. More of them are listed in Table 1.

Table 1. Some funders or initiatives interested in improving shea (*Vitellaria paradoxa*) value chains

Funder / Driver	Topics	Key focus terms and types of innovation requested
World Bank (WB)	Value chain	WB initiative for restructuring shea value chain in Mali
AarhusKarlshamn (AAK)	Resource improvement	AAK collaborating with ICRAF on shea improvement in West Africa
Great Green Wall (GGW)	Land and vegetation restoration	GGW initiative for restoring degraded landscapes using agroforestry practices and technologies
Global Shea Alliance (GSA)	Resources improvement	GSA initiative for a regional research programme on shea along with national governments
Green Climate Fund (GCF)	Climate adaptation and mitigation	Initiative to help developing countries to limit or reduce their greenhouse gas emissions and adapt to climate change
African Forest Landscape Restoration Initiative (AFR100)	Land and vegetation restoration	Forest Landscape Restoration Initiative

Main Interventions

The core problem to be addressed by ICRAF's research programme presented here is the decline of shea natural resources within its distribution area of WCA. The proposed activities are grouped in four components. This programme is expected to restore and sustain shea resources for equitable and improved livelihoods in WCA through a transformation into a climate resilient and sustainable green economy (Table 2).

Table 2. *Theory of Change (ToC) of shea (Vitellaria paradoxa) value chain of WCA*

COMPONENTS	Activities	Outputs	Outcomes	Impacts
1. Production	Assess the current status and distribution of shea populations and document regeneration practices used in WCA region	Current status of shea population and regeneration practices across WCA documented, including effects of natural and anthropogenic factors on shea population	Stakeholders adopt a positive attitude towards tree planting and regeneration based on information on current status and regeneration practices	Restored and sustained shea resources for equitable and improved livelihoods in WCA
	Characterise diversity (morphological, nutritional, chemical) for breeding and develop improved shea germplasm	Improved shea germplasm available in genebanks and motherblocks for multiplication by large and small-scale tree nurseries		
	Disseminate improved shea germplasm to end users	A network of tree nurseries is producing and distributing improved shea planting material	Farmers use improved shea germplasm that is adapted to field conditions at large scale	
	Conduct multi-location trials for cultivar development using elite accessions (propagation methods/ phenotypic/ genotypic) and establish long-term observatory sites (stations, farms)	Performance and behaviour of elite accessions under different field conditions evaluated		
	Establish highly visible demonstration shea tree planting plots (schools, hospitals, roadside/lines, city squares, other public areas)	Performance and behaviour of improved shea germplasm under different field conditions demonstrated	Farmers obtain better yields and product quality from their shea trees	
	Develop appropriate shea tree crop management techniques and practices, including optimum density for shea tree intercrop systems	Bottlenecks of shea resource management identified, and appropriate shea management techniques developed	Farmers use improved agronomic practices at a large scale	
	Develop modules for sustainable shea resources management for vocational and academic trainings (university, school, farmers, extensions, professional schools)	Training modules for sustainable shea resources management produced and distributed to universities, agricultural schools, extension services and producer organisations	Farmers use their improved capacity and technical knowledge to enhance shea resources;	
	Capacitate key stakeholders on improved management techniques and practices	Key stakeholders are trained on good shea management techniques and practices	Extension agents use their improved capacity and technical knowledge to improve their training approaches	

2. Policy & Regulations	Raise awareness of policymakers and other stakeholders (lobbying, radio, etc.)	Policy makers and other stakeholders are informed about the importance of sustainable management of shea resources	<ul style="list-style-type: none"> - Policymakers are aware of policy dysfunctionality and are committed to support policy reforms for sustainable and participatory shea tree resource management - Effective implementation and adoption of policy reforms that result in sustainable management and trade of shea resources - Adequate policies and bylaws for the sustainable management and trade of shea resources are effectively disseminated
	Analyse local, national and regional policies and regulations (tree management, markets, conservation)	Policy related bottlenecks of shea resource management and trade identified and documented	
	Evaluate different options for negotiating village-level shea resource management agreements and develop guidelines	Guidelines for effectively negotiating village-level shea resource management agreements	
3. Market access, entrepreneurship and linkages to the private sector	Build capacity of key actors on post-harvest handling and processing	<ul style="list-style-type: none"> - Guidelines for improved processing techniques developed - Training on improved post-harvest handling provided to collectors and their associations - Material support for improved processing and quality provided to processors 	Producers and other markets actors and produce high quality shea products because they are better skilled
	Analyse different organisational forms and governance mechanisms to build the negotiation and bargaining power of farmers and small and medium sized enterprises to markets in different contexts	Guidelines for organising and managing producers and small and medium sized enterprise in different contexts developed	
	Identify and analyse opportunities and constraints for participating in existing and new markets including certification as well as investing in new product development in the shea value chain	New markets identified and new products for small and medium size enterprises developed	Market actors are better connected to markets and therefore increase their income from shea trade

Partners and Roles

Many actors from various disciplines and institutions – scientists from universities, national research institutes, extension services, national and international NGOs – will be working simultaneously on issues regarding

1) production and research, 2) policy and regulations, 3) value adding and market development, as well as 4) support services and finance

Table 3. List of potential actors and partners needed for the development of a sustainable shea (*Vitellaria paradoxa*) value chain in WCA

Domain	Partner	Domain	Partner
Production & research	Universities ICRAF NARS Extension services Farmers	Value adding & market development	NGOs - ICCO - ACDI/VOCA Private sector - OLVEA - Savana fruits - AAK - CODERS - SOATAF - Mali-shea - Karilor - Processors
Policy & regulations	Members of parliament (MPs) Mayors NGOs Scientists	Support services & finance	Farmer-based organisations (Nounouna/BF, Mali-sibi, Aproka) ICRAF NARS Extension services MFI Banks VSLA Ministries

Stakeholder Engagement

ICRAF engages with a wide range of stakeholders to implement activities. ICRAF will issue ‘calls to action’ across sectors to effectively engage with all partners for the implementation of its strategy on shea value chains in West and central Africa.

ICRAF will leverage its reputation as an organization that promotes inclusive and sustainable development of shea and agroforestry and as a trusted partner in developing sustainable shea value chains in West and Central Africa for governments and policymakers, donors and regional and international development organizations, the private sector and farmers and beneficiaries.

ICRAF will continue to implement innovative rehabilitation practices for degraded shea landscapes that support national efforts in rehabilitating shea parklands. ICRAF has successfully pioneered innovative natural regeneration technologies to improve shea tree production, domestication, and more resilient and faster-growing varieties of shea with more than 20 years of experience on the

ground supporting production and rehabilitation of shea landscapes in Mali.

ICRAF will continue to support women’s groups engaged in the shea sector for land property rights to build resilient communities and improve women’s conditions.

There have been clear, beneficial results for both farmers and ecosystems from ICRAF’s efforts in empowering local communities and women’s groups to produce and process shea as well as implementing agroforestry systems, reducing pressure on shea tree degradation and the environment. This has made significant improvements in the livelihoods of target populations as well as increasing food security.

The proposed stakeholder engagement plan will communicate the above messages and provide a platform for follow-up and tracking potential donors and investors to support the strategy for sustainable shea value chains in West and Central Africa.

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