

Parkland Management Guidelines



Global
Shea
Alliance



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OBJECTIVE AND CONTEXT

Objective And Context Of The Guideline

In 2015, the Global Shea Alliance (GSA) launched a sustainability program that identifies industry-wide challenges and implements solutions via stakeholder guidelines and collaborative projects. The GSA adopted the following work streams to be implemented through the sustainability program: (1) storage facilities for women's groups in shea communities; (2) capacity building and business training for women's groups; (3) pilot projects to improve the health and safety of collectors; (4) research and development of improved planting materials; (5) parkland management trainings for shea communities; and (6) conservation pilot projects. This guideline aims at sharing best practices and objectives for the 5th workstream: parkland management.

The guideline is intended to serve as a guide to GSA sustainability partners to build the capacity of farmers, especially the women collectors to maintain and restore the existing shea parklands. It will guide sustainability partners in developing interventions around 4 areas:

- Grafting
- Farmer Managed Natural Regeneration
- Development of Local Conventions and Bylaws
- Biodiversity





Section 1

CHALLENGES OF SHEA AGROFORESTRY PARKLAND MANAGEMENT

1. Challenges Of Shea Agroforestry Parkland Management

The system of agroforestry management for the trees are entirely managed by farmers. The challenges of shea parkland management are:

1.1. Lack Of Traditional Planting Practices

Rural African communities do not usually plant local species, including shea because of the long propagation period for these trees .

1.2 Land Regulation

In most shea-producing countries, there are laws that prohibit the cutting of shea trees for firewood or charcoal production. However, illegal logging is common. The laws regulating tree cutting are normally for matured trees and not younger trees regenerations. Farmers and land owners therefore destroy regenerated trees during land preparation for agriculture. Since farmers manage these parklands, they decide which tree to cut and which one to protect, if they consider that tree distribution is too dense, farmers will pull out the young plants not covered by the laws rather than cutting the older trees.

1.3 Land Tenure

Generally, in rural areas, land and trees belong to men (with some exceptions), while the shea kernels are traditionally used by women. While women are the main actors in the value chain, during harvest, processing and marketing, they have less influence with regards to land and natural resources management in their communities. Women are also not allowed to take initiatives even though they are directly affected by shea tree conservation bad practices. On the other hand, densification of the shea trees fields often conflict with the space required for traditional crops (shading, spacing to allow passage of the plow).

1.4 Low Fallow System

Decline in fallow systems is a major contributor to the degradation of parklands as there is no natural regeneration. According to INERA, 65% of farmers in southern Burkina Faso no longer practice fallow system because of lack of arable land. They continue to till the land on an annual basis leaving no room for natural regeneration. When the land is left for a period of 3 years, there is a high rate of natural regenerations as show below in Burkina Faso.



Zero Fallow Parkland in Southern Burkina Faso



Regeneration in a three-year fallow for a self own or farmer selected



Healthy Parkland



Unhealthy Parkland



Healthy Tree



Unhealthy Tree



Section 2

RECOMMENDED STEPS FOR PARKLANDS MANAGEMENT TRAINING

2. Recommended Steps For Parklands Management Training

Six major steps are required to implement trainings in shea agroforestry parklands.

Step 1: Problem Identification & Consultation of Local Stakeholder

Step 2: Problem Diagnosis

Step 3: Develop interventions

Step 4: Develop implementation strategy

Step 5: Conduct Training

Step 6: Monitoring and Evaluation

2.1. Problem Identification

Before a training or technical intervention is developed for parkland related trainings, it is important to understand what the problem is, what triggers it and how it is affecting the community and the ecosystem. It is recommended that, the community, especially the women collectors are consulted during this phase and their perspectives on the causes and effects of the problem included. In view of the relevance of culture in these communities, trainers must involve local and traditional authorities in the process in order to get their approval and commitment to such interventions.



Felling Of Shea Trees

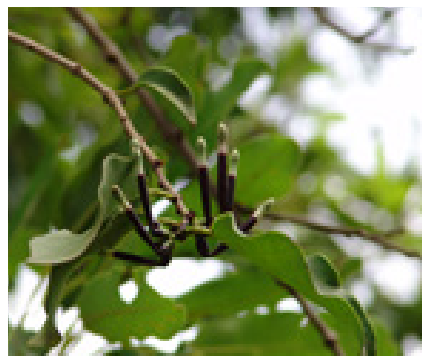
2.2. Problem Diagnostic

To fully develop interventions, it is important to diagnose the causes of the problems. For example, what causes bush fires or what motivates people to cut trees for firewood and charcoal? Use the the community's human resources such as customary authorities and village development committee so that they can give their opinion.

Causes Of Parkland Degradation



Bush Fires



Hemi parasites, pests and diseases



Commercial agriculture

2.3. Develop Technical Interventions

This step involves the development of various interventions to solve the problems identified above. They may include training models, community sensitization, conflict management, poverty reduction strategies aimed at dealing with the problem from source. The community and culture should be considered to determine what interventions work and which ones do not. It is important to consult the leadership specially the land owners to get their approval so that the women will be able to receive the trainings and execute the interventions on the fields.

2.4. Develop Implementation Strategy

This involves identifying the activities, steps and stakeholders that will help bring about the change. It also involves identifying the tools and channels to use to implement the intervention including trainings, posters, radio announcement, poverty reduction initiatives, basic education lessons among others.

2.5. Conduct Trainings

Trainings must be done at the most convenient venue and also in the most convenient language to ensure its effectiveness. The training must be structured to show the trainees what exactly the need to know. It must be simple, concise and easy to understand with pictorials. The trainings should focus on:

Sensitization

- Behavioral Change: Encourage the community to abandon bad practices: bush fires, tree cutting, unripe fruit harvesting, night harvesting. Let them understand why the benefits of keeping the trees and the agroforestry parklands sustainable.
- Importance of parklands to the community and ecosystem: Revenues from shea support community development including education, health and poverty alleviation. Keeping the parklands strong and sustainable will ensure the prosperity of the community and their their generations.
- Importance of shea in the communities: Emphasize local use including economic, food, nutritional, medicinal, and environmental value to the community and its inhabitants.

Audience

The audience must include all stakeholders in the community and local government that have direct interest or responsibility to the parklands. A list of stakeholders to invite include:

- Women collectors and their husbands
- Local and regional authorities
- Customary and religious authorities
- Youth groups and community-based organizations
- Government services



2.6. Monitoring And Evaluation

This step involves following through on the trainees to ensure they utilize the trainings received. It also involves providing extension services to trainees to ensure they fully understood what they learnt and are able to apply it on the field. The M&E will also enable the team collect data on the implementation strategy to advice future program development and implementation strategies.



Section 3

BEST PRACTICES ON SHEA GRAFTING

3. Best Practices On Shea Grafting

3.1. Introduction

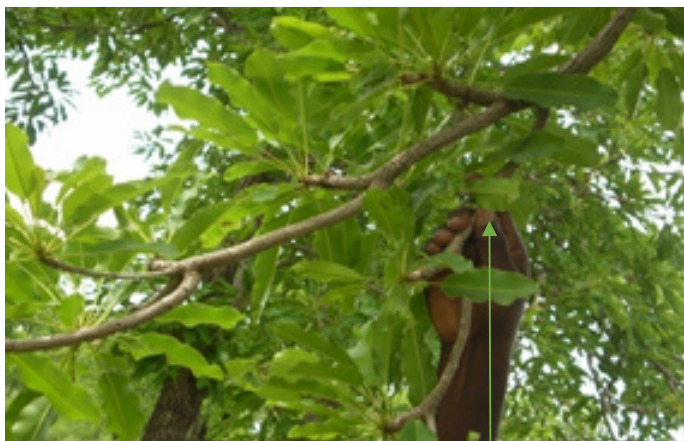
Grafting is a common method of vegetative propagation that is used primarily for tree crops. It consists of joining together a piece of tree branch (containing series of buds) known as the scion and an established root stock so that they may grow together as a single plant. It is also the process of inserting a piece of soil wood with several buds into a rootstock so that the two pieces can grow together as a unit. In the general sense therefore, grafting consists of preparing and placing together plant parts so that they may grow together. One can therefore talk of grafting when a single bud is used in the grafting operation. The practice of grafting on shea can help reduce the long gestation (maturity) period of the tree. Success in forming a permanent graft union between plants or plant parts depends upon two things. Intimate affinity or relationship often referred to as compatibility between stock and scion joined together. Contact between the cambial surfaces of the two plant parts. The continuous cambium and related elements in the dicotyledons lend themselves to the grafting process. On the other hand, the scattered management of the vascular bundles in the monocotyledons and the absence of secondary thickening make grafting in these subjects more difficult.

3.2. Reasons For Grafting

- To propagate or assist in propagating plant varieties not otherwise conveniently propagated.
- To substitute one part of a plant for another.
- To join plants each selected for special properties of disease resistance or adaptability to special conditions of soil or climate.
- To repair damage, overcome scion-stock incompatibility and to invigorate weak plants.
- To enable one root system to support more than a single variety or one branch system to derive from more than one root system.

3.3. Components Of A Graft

Scion: the scion is the part of a plant used for grafting up on the stock plant. It may be a bud or scion-stick.



Normal shoot



Epicormic shoots



Rootstock: this portion of a graft is the root-bearing plant on which the scion is grafted

3.4. Important Considerations For Successful Grafting

For any successful union, the two cambial surfaces must produce callus. Callus is a term applied to the mass of undifferentiated or parenchymatous cells that develops from and around wounded plant tissue. In a general sense, it is important to bear in mind that a grafting operation essential involve making a wound or wounds in the subjects under consideration. Callus occurs at the junction of a graft union and arises from the living cells of both scion and stock. The graft-take or healing process involves the interlocking of these parenchyma (callus) cells across the graft union. Other cells differentiate from these callus cells to give rise to the various elements in the union anatomy. For any successful grafting operation, the following five important requirements must be fulfilled.

1. The stock and the scion must be compatible i.e. they must be capable of uniting. Usually, closely related plants can be grafted together but this is not always so. Distantly related plants e.g. mango and orange cannot be successful grafted.
2. The cambial region of the stock and scion must be in close juxtaposition with the cut surface being held tightly together by wrapping. Rapid healing of the graft union is necessary to prevent the scion from wilting.
3. The grafting must be carried at a time when the stock and scion are in the proper physiological state. The scion bud must be dormant. The rootstock plant may be dormant or active growth, depending upon the grafting method used. In Ghana, best results are obtained when the stock is in active growth soon after favorable weather.
4. Immediately after the grafting operation is completed, all cut surfaces must be carefully protected from desiccation or entry of water. In difficult subjects, this will mean covering the graft union with melted wax or candle.
5. Proper care must be given to the grafts for a period of time after grafting. All shoots originating from below the graft union must be removed and the scion given every chance to develop.

3.5. Required Environmental Conditions Are Necessary For Successful Formation Of Callus Tissue:

1. Temperature has an important part to play in union formation. Callus formation is slow under very cold conditions but quickens when the weather is warm. Unless performed under unusually cold condition, such as may be found at Aburi and other places for instance rainy weather, callus formation under Ghanaian weather conditions will proceed normally and quickly.
2. Oxygen supply to the graft is also necessary for the process of callus information. The usual tying material (raffia) used for securing the graft union allows ample supply of oxygen to the development of the callus cells for a successful union. It is however necessary to tie the union firmly during the first two weeks or so to ensure that the cut surfaces are in very close contact to facilitate the callus bride development and to exclude water from cut surfaces.

3.6. Timing Of Grafting

The best month to graft shea trees is between April and June. It should be done either early morning or late afternoon. Scion size: 6 - 12 cm long ; 2 - 3.5 cm thick

3.7. The Steps To A Successful Grafting

Step 1 – Prepare The Scion



1 Select and cut a desirable scion from a mother tree



2 Prepare the scion by removing the leaves



3 Peel off the side that will be grafted unto a stump



4 Prepared scion ready for grafting

Step 2 – Prepare The Rootstock To Graft

There are two ways to prepare the root stock for grafting: Top Grafting and Side Grafting

• Top Grafting



1 Cut off the crown of scion to about 5-15cm from ground level to form a short smooth edge



2 With a sharp knife, make a vertical incision across and into the top of the remaining root stock



3 Shaped scion is fitted into the incision and driven into the rootstock



4 The fitted area is bound with a binding tape to make the fitting water proof



5 Grafted scion on a stump

• Side Grafting



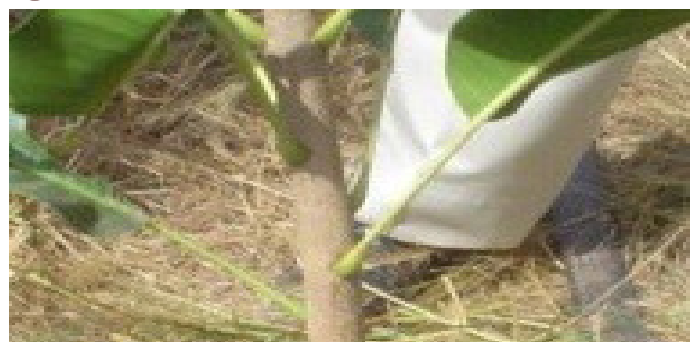
1 Make a slanting cut into the rootstock at about 1/3 the height from ground level



2 Ensure that cut portion will fit with the scion



3 The place of contact is covered tightly with binding tape to make it water proof



4 A side grafted tree

3.8. Tools And Accessories

Of the tools employed by a nurseryman, knives come first in importance. There are other tools required for grafting including shears, saws, pruning knives, stropping leather. There are different type if knives.

- **Knife for general grafting:** Should be of good quality, have a straight edge blade strongly set in a handle large enough to afford a comfortable grip. The blade is about 7.5cm long, set a handle of 10 – 12cm.
- **Double-bladed knives:** these are special knives used for patch budding.
- **Pruning and trimming knives:** The grafter should preserve these knives for the operations for which they are made. A generally useful knife is the ordinary curved-bladed pruning knife.
- **Budding knives:** Budding knives are made to be sharpened to give a thin sharp edge for making incisions in the rootstock or for cutting bud for budgrafting. These types of knives are usually not beveled in any special way but are made to be sharpened at angle in either the forward or backward strokes.
- **Grafting knives:** Grafting knives are beveled so that the unbevelled side remains always flat on the sharpening stone on the back stroke. This is to ensure that the flat surface remains always flat in order to produce perfectly smooth graft surfaces during the grafting operation.

CARE OF TOOLS

The whole grafting blade should be kept clear of dirt and congealed plant juices by scrapping and polishing as necessary. Tools not in use should be oiled prevent rusting. Grafting knives should only be used for the purposes for which they have been procured remembering that they have to be obtained at much greater cost than any ordinary knife. Tools such as shears, saws, pruning knives, stropping leather, if available, and any other horticultural tools and equipment used by a nurseryman, should be kept in a safe place at all times.

- **Technique of sharpening:** The knife should be held to the stone at an angle of between 20 and 25 and moved with slight pressure against the cutting edge. A correctly sharpened knife will retain a sharp edge for many days' work and during it, only stopping on leather to retain a perfect edge will be required.

3.9. Maintaining The Grafted Trees

- Prune off all side shoots from rootstock regularly
- Prune off low branches from scion until the scion is about 1m tall
- Protect from bush fire
- Control weed growth



Section 4

FARMER MANAGED NATURAL REGENERATION

4. Farmer Managed Natural Regeneration

Farmer Managed Natural Regeneration (FMNR) is a simple concept of systematically regenerating mainly tree species in the natural from living tree stumps, roots or seedlings. It involves a process of selecting healthy and vigorous natural seedlings and removing by cutting off through proper pruning of the unwanted ones. With this concept, farmers with simple farm implements such cutlass or pruning shears could be trained on how to maintain and healthy shea population with the African Savanna.

Zero Fallowed Parkland: FMNR is also a rapid, low cost and easily replicated approach to restoring and improving agricultural, forested and pasture lands on which shea plantations are found. FMNR is based on encouraging the systematic re-growth of existing trees or self-sown seeds. It can be used wherever there are living tree stumps with the ability to coppice (re-sprout) or seeds in the soil that can germinate. The vast Savanna Parklands still have coppiced shea tree trunks, shea stumps and shea seeds in the ground from which there is potential for FMNR.



Zero fallowed parkland



Two year farmer managed natural regeneration

4.1. Management Of The Shea Tree For A Healthy Population

- Control of weeds around young seedlings
- Thinning out of shea saplings
- Pruning of shea sapling
- Protection from bush fires
- Encourage regeneration of saplings
- Encourage fallow parklands
- Control of diseases; most common is the mistletoe (cutting off a whole infected branch)
- Pruning of unyielding and dry branches
- Coppicing of shea tree especially when yield is declining.
- Protection from bush fires

4.2. How Does The Concept Of Fmnr Work On Shea Parklands?

The FMNR project model involves both awareness creation and behaviour change components, along with the physical practice of restoring and managing tree growth shea parklands. The physical methodology of FMNR practice is extremely simple. The basic concepts are as follows:

- Shea tree stumps, naturally growing shea saplings and coppiced shea trees that are re-sprouting are selected.
- Those young shea trees which are to be managed through FMNR are then pruned, leaving only a small number, sometimes even only one strong sprout. This can then grow more quickly because it is not competing for resources.
- In vast and expanded areas of shea parklands sample sites selected should be, marked by posts, and photographed. This will provide valuable information over time for monitoring and evaluation and will provide a convincing historical record.
- Participants periodically return to the young shea trees to prune away new sucker branches so they do not drain resources from the selected branches.

4.3. Steps To Farmer Managed Natural Regeneration

- Do not automatically slash all shea tree growth. Instead, survey your farm, noting how many and what are present. Eg. Are they young shea saplings growing in a cluster? Or are they shea tree stumps?
- Select the shea tree or sapling which will be used for regeneration.
- Select the best two (or so) stems to prune, and cull unwanted ones. In this way, when a farmer wants wood, he/she can cut the stem(s) that are needed and leave the rest to continue growing.



Section 5

DEVELOPMENT OF LOCAL CONVENTIONS AND BYLAWS

5. Development Of Local Conventions And Bylaws

Mostly across the savannah zone where shea trees grow, land tenure system is a huge problem. Most lands are owned by families, communities and individuals and headed by the local chief or community leader. This makes them the owners of the trees with authority to make decisions on what happens to shea trees. However, the trees are mostly used by women who collect shea fruits and process into kernels and sometimes butter. The goal of this section is to provide guidance on the development of local by-laws to encourage community effort in protecting and presenting the parklands. This will help secure the shea parklands and attract interest by the communities in the protection, restoration and enhancement of the parklands. The steps to develop a community by-laws are:

5.1. Problem Identification And Diagnosis

Identify existing cross-cutting issues relating to parklands in the community. This should be done through questionnaires, face to face interview, community engagement that involves traditional authorities, government departments, environment agencies and women collectors. The following Steps are encouraged:

5.2. Stakeholder Engagement

This involves meeting and engaging with all relevant stakeholders including women's groups, local authorities, land owners, land administrators and the general public. The discussion should focus on developing objectives towards securing the parklands in the locality and ensuring their sustainability. This step is important to ensure that all stakeholders contribute to develop the by-laws and help implement them in their respective capacities. This process also involves defining what role each stakeholder will play and define their responsibilities. Periodic meetings between different stakeholders also need to be organized to ensure ownership, these also include technical services.

5.3. Develop A Draft Convention

This is where the by-laws are developed based on problem identification and stakeholder consultations. It is important to take into consideration the existing norms and values of the locality as well as the country's laws that regulate the parklands. Clear rules of natural resource management needs to be defined. And land conflicts needs to be anticipated. Here greater consultation with the forestry commission, institutions of research as well as the local government is crucial to ensure that the by-laws would not conflict existing regulations and also respect local norms and values.

5.4. Stakeholder Validation And Signature

When the by-laws are developed, it is important to engage the stakeholders again with the draft by-laws for their validation and adoption. This is important because it allows the stakeholders submit their feedback and reviews so that the laws are reflective of their expectations. At this stage, incorporate the stakeholder's feedback to obtain a document that is inclusive of all stakeholders' opinions. The final versions should be submitted to all stakeholders again to append their approval and adoption. To ensure ownership of the convention by municipal authorities, it is important to organize information and awareness sessions. If possible, have these by-laws gazetted by the local authorities to ensure effective implementation on the ground.

5.5. Implementation Of By-Laws

When the by-laws are fully developed and adopted by all stakeholders, it is important to implement the rules on the ground to protect the parklands. Establishment of a multi-stakeholder platform.

This includes the following:

- Establishment of a management committee and mobilize financial and human resources to enforce the provision of the convention
- Establishment of community level implementation teams and design a leader for each team
- Organize information and awareness session for each community level implementation teams
- Translation of the by-laws in local languages and dissemination
- Implementation of the by-laws, including set-up of road signs, and the application of sanctions
- Monitoring and evaluation
- Organization of regular meetings between relevant stakeholders



Section 6

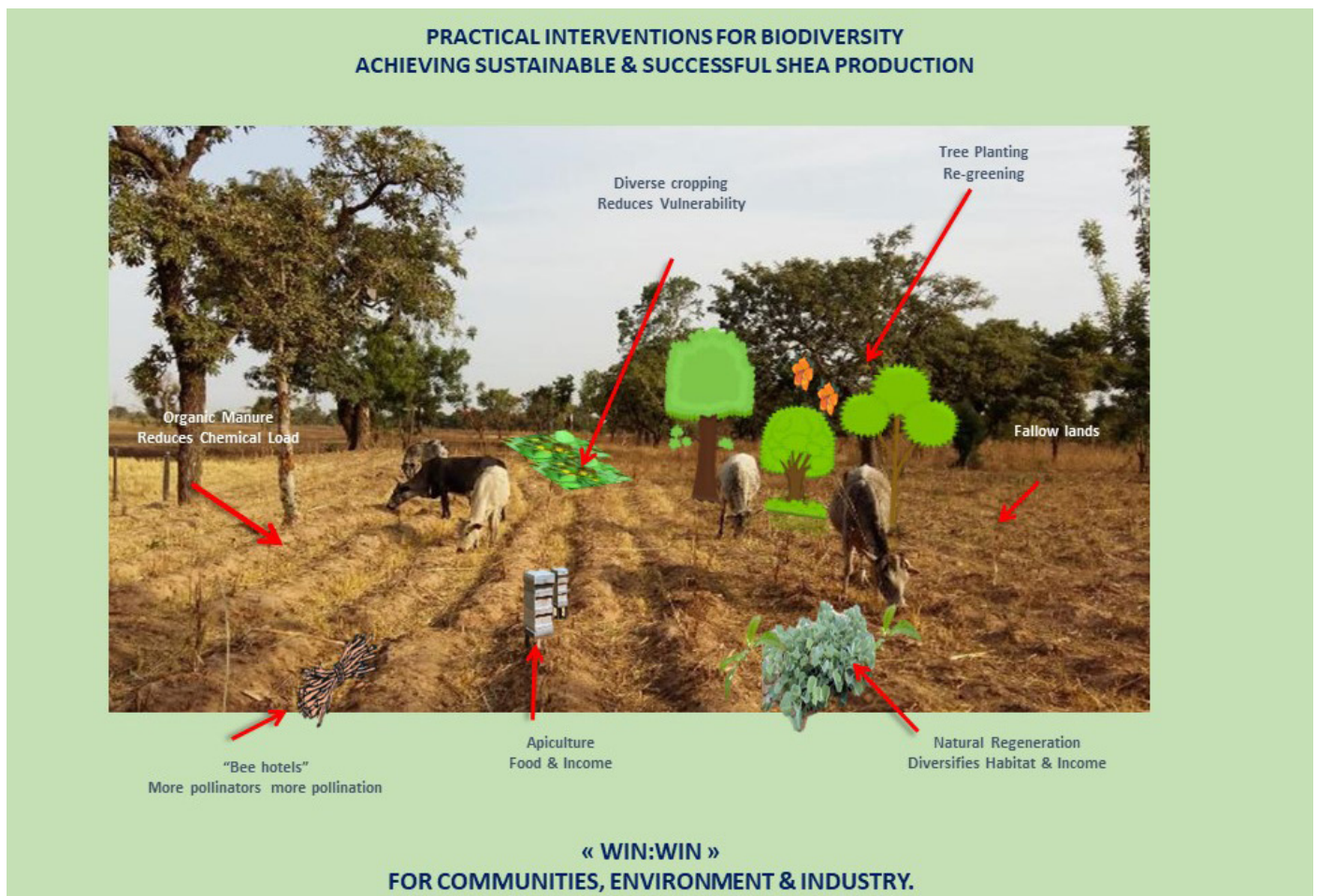
BIODIVERSITY

6. Biodiversity

6.1. Why Is Biodiversity Important On Shea Parklands And Farms?

Shea is pollinated by insects, primarily honey and stingless bees. Shea flowers once a year, typically for a few weeks only, and insect pollinators are essential to fruit formation. Research found that insect pollination can help Shea produce 2.5x more fruit, than when there are no pollinators are present. Adding extra pollinators could therefore increase yield further. The presence of pollinators, and pollination services, is dependent on having a biodiverse habitat. As bees can forage over several kilometres, it is helpful to think about the most favourable landscapes as being composed of a 'mosaic of different plants'. How can we enhance pollination for improved yield? Improving pollination services through increased habitat biodiversity can be achieved through implementing the following practices, shown in the model farm. This approach is called the Tree Bees and Birds strategy.

6.2. Farm Model



Source: BirdLife”

The agro-ecological activities which form part of the model farm include:

- Fallow land provides bee forage – an increased variety of plant species help ensure a consistent food source for insect pollinators throughout the year.
- Bee keeping– hives on farm provide not only additional pollinators, but in turn an additional source of food and medicine, and income for farmers.
- Bee hotels –dead wood and sticks provide nesting habitats for insect pollinators.
- Inter-cropping – diversifies the landscape with a greater variety of crops. This makes a more attractive habitat for pollinators, and improves crop resistance to pests and disease.
- Reduced chemical use – with associated co-benefits for human and environmental health.
- Tree planting – increases habitat diversity for birds, pollinators, and enhances water and soil retention.
- Assisted Natural Regeneration
- Mulching and Composting – protects plants and improves growth via increased provision of nutrients and water preservation.

6.3. Estimated Cost Of And Approach To Successfully Integrating These Activities On Farm

Activity	Training Costs	Equipment Costs	In-kind Contribution
Bee Forage	NA	NA	Integrated in land-use decisions. Please note that these decisions may have cost implications (e.g. diverse cropping, assisted natural regeneration (RNA), tree planting, etc.)
Bee Keeping	5 days of training for 20 farms: <ul style="list-style-type: none"> Trainer (200\$/day) Trainees (\$9-15 per farm (for coffee break and restoration)) Others (room location, Office supplies, etc..) 	5 bee-hives: \$208 <ul style="list-style-type: none"> Hive tools/frames: \$21-25 Metal support: \$83-100 Smoker: \$13-15 Bee brush: \$4-5 Water trough: \$12-15 etc. Coverall + veil: \$50 Gloves: \$12 Boots: \$12 Foundation sheet(wax): \$7 --- \$422	<ul style="list-style-type: none"> Bee-hives monitoring Honey harvesting
Bee Hotel	NA	Machetes to prune and gather dead wood	1Man/Day for 1 hectare
Inter-cropping	NA	NA	Integrated in land use decisions
Reduced Chemical Use	2 days of trainings for 20 farms: <ul style="list-style-type: none"> Trainers: 50-75\$/day Trainees (\$2 or 5 per farm (just food)) Others (room location, Office supplies, etc..). 	<ul style="list-style-type: none"> Cement to stabilize the pit: \$25 Shovel: \$8 Pickaxe \$12 --- \$45	<ul style="list-style-type: none"> Pit digging: \$83 Pit filling Maintenance (watering, periodic reversal)
Tree Planting	1 day of training for 20 farms: <ul style="list-style-type: none"> Trainers: 50-75\$/day Trainees (\$2 or 5 per farm (just food)). Others (room location, Office supplies, etc.) 	Up to \$2 per seedling, depending on the species	Pitting, plantation, periodic watering(once a week), and weeding
Assisted Natural Regeneration	1 day of training for 20 farms: <ul style="list-style-type: none"> Trainers: 50-75\$/day Trainees (\$2 or 5 per farm (just food)) Others (room location, Office supplies, etc..) 	<ul style="list-style-type: none"> Machete: \$5 Pruning shear: \$20 Daba: \$1 -- \$26	Periodic weeding and pruning

6.4. What Are The Additional Benefits Which Can Be Associated With These Activities?

Please note that these benefits are subject to seasonal / climatic / variation and possible other externalities.

Activity	Assumptions	Benefits
Increased Shea Fruit Production	<ul style="list-style-type: none"> • Pollination can improve fruit production by up to 2.5 times • Each woman collects 2 bags of \$85kg of Kernels? per season • Price / kg: \$0.2 	\$51 per farm Bonuses derived from potential improvement to quality
Honey Sale	<ul style="list-style-type: none"> • 9 dishes (3-5kg) of honey harvested in March/April by hive • An average of 2-3kg of dishes of honey harvested during August/October • Average Selling price : \$10/dish 	\$140 per year per farm Food, and topical antiseptic medicine for wounds, cuts, etc

Recognition

This initial version of the parkland management guideline was compiled with consultation and support from:

- The United States Agency for International Development (USAID);
- BirdLife International;
- ICCO Cooperation;
- Institut de l'Environnement et de Recherches Agricoles (INERA);
- Institut National des Recherches Agricoles du Benin (INRAB);
- Naturama;
- Mr. Francis Chimsah, University For Development Studies
- The Nigerian Institute for Oil Palm Research (NIFOR);
- The Sustainability Working Group
- Universite de Korhogo (Côte-d'Ivoire); and
- World Agroforestry Centre;

The manual will be updated periodically, incorporating feedback from the executive committee, sustainability partners, working groups, and the general assembly.

