

CBI Uganda Climate-Smart Coffee Project

Farmer Training Module – Shade Trees and Coffee and Banana Intercropping

Regions: Buganda (Robusta) • Western (Arabica)

Delivered by: extension agents, lead/peer farmers, or SME trainers/agronomists

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CBI



Transforming Trade Together

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A. Module Snapshot

Item	Detail
Practice	A climate-smart system of intercropping coffee, banana, and specific types of shade trees tailored to the local agro-ecological environment. This combined canopy and root system protects the soil from washing away, retains ground moisture, and reduces weeds. Additionally, trees act as nutrient pumps, falling leaves and banana stalks decay to naturally feed the soil, shielding the crop from the effects of extreme sunshine and heat.
Core message	• Adding banana and shade trees protects your coffee from heat, boosts your farm earnings, and provides food for your family. • Do not leave money on the table; protect your farm and increase your profits by diversifying.
Session length	2 hours in the field, at a real coffee garden.
Facilitator	Agronomist, Extension Agent, Lead/ Peer Farmer, or SME trainer.
Materials	1. Recommended shade-tree seedlings and/ or banana suckers (the planting material). 2. A hoe, panga or secateurs for pruning, and a rope or tape for spacing. 3. The Shade Tree Illustrated Poster. 4. The Uganda Sustainable Coffee Toolkit Charts: 2 - Manage your Coffee Tree Canopy; 11b - Business Case; 16b - Protect and Conserve your Soils; 17a - Trees on the Farm; and 17b - Recommended Shade Trees per Region 5. Flip chart or paper with markers or pens.
Key visual	Stand between a well-shaded coffee garden and a sun-scorched one or use the Shade Trees poster to illustrate best practice versus doing nothing.
Commitment	Work with the community influencers to drive commitment.

B. Introduction / Overview

When we invest in climate-smart and/or sustainable coffee production, everyone wins.

- For farmers, it reduces missed income by locking in soil moisture and nutrients, protecting the coffee trees from intense sunshine and heat damage, and boosting productivity.
- For SMEs and exporters, it secures a loyal, climate-resilient supply chain with predictable volumes and high-quality beans.
- For international buyers, it guarantees a reliable stream of fully traceable, EU-compliant coffee that meets consumer demand.

True sustainability means connecting the farmer's profitability directly to the security of the global market.

This training module focuses on shade trees and banana and coffee intercropping, one of the most income-relevant and climate-smart practices a farmer can adopt.

- The right shade protects coffee from harsh sun, heavy rain and wind, steadies the harvest through dry spells, slows cherry ripening so beans are denser with better cup quality, and feeds the soil through leaf litter.
- Shade and companion trees give a second food source and/ or income source— bananas, firewood, fodder and future timber.
- Beyond the farm-level benefits, this practice is a core requirement for entering premium markets under organic, Climate-Smart, and other sustainable coffee standards.

This training content is aligned with the Uganda Sustainable Coffee Toolkit and Charts and the MAAIF Robusta and Arabica Technical Handbooks. Facilitators must align new trainings with MAAIF and NaCORI latest recommendations and guidance.

Note for facilitators—lead with income and drought insurance, not agronomy

- Lead with the right shade → steadier harvests in dry years + better-grade beans + a second income (bananas, firewood, and timber).
- These are the benefits that drive a farmer's decision.
- Open every session with these.
- Then bring in the wider benefits—windbreak, biodiversity, nitrogen-fixing trees, and soil and water conservation—as supporting points, not the opening. Resolve the “shade cuts my yield” fear early with the spacing-and-pruning rule.
- Keep the language visual; the poster carries the technical list.

This training module has been designed with a “missed income” framework. The missed income concept was co-created with coffee farmers, where farmers revealed that their primary motivations are concrete household goals like school fees and financial independence. While farmers traditionally viewed shade trees with suspicion—fearing they reduce yield—reframing it around how much money they quietly lose each season through sun-scorched, low-grade coffee and forgone tree income triggered a powerful shift from apathy to urgency. Grounded in behavioral economics and Social and Behavior Change (SBC) principles, this approach leverages loss aversion: the reality that people are twice as motivated to avoid a loss as they are to achieve a gain. By framing farms without shade as “income walking off the land,” the training makes the invisible, cumulative cost of inaction feel immediate, personal, and emotionally proximate, capturing farmers' attention far better than standard agronomic best practices.

Farmer Spotlight — [Name], [Village, Subcounty, District]

- What this farmer did: [e.g. shade species planted, spacing used, coffee-banana intercrop]
- Result: [e.g. steadier harvest in drought, grade/price increase, regular banana/firewood income]
- SME homework: Identify one local shade tree/banana coffee intercropped champion. OR Prepare a one-page spotlight (photo + 3 sentences) to share during training. Optional, but significantly boosts credibility.

C. Facilitator session plan: the 5-part arc (2 hours)

Part 1: Reflect (10 min)

Introductions between the facilitators and farmers.

Stand the group between a well-shaded coffee garden (e.g. coffee in a banana plantation at correct spacing) and a sun-scorched one (or hold up the Shade Tree Illustrated Poster).

Let farmers answer first; do not correct yet.

Ask

- What differences do you notice between the two gardens?
- Which one looks closest to your own?
- Who do you think earned more, and why?
- Whose coffee survives a hard, hot, dry season, the shaded one or the bare one?
- In your village, whose coffee garden has trees and bananas, and what else do they earn from it?

Lead/peer-farmer version (If the session is facilitated by a lead/peer farmer)

- Open with your own story.
- Show your own garden, how your shaded coffee held up in the last dry season, and what you earn from your bananas and trees.

Part 2: Discussion on benefits, myths & gender (20 min)

Ask

- What stops you from planting shade trees?
- What have you heard about shade and coffee?

Let the myths come out, especially “shade reduces my yield”—then answer each one a farmer raises by name. (Full responses in the Annex.)

Then state the poster’s benefits plainly:

- Protects coffee from high sun, heavy rain, hail, and wind (a windbreak) → fewer losses.
- Slows cherry ripening, resulting in denser beans, better cup quality, and grade.
- Leguminous trees (e.g., Albizia) fix nitrogen; leaf litter acts as mulch and feeds the soil.
- Increases biodiversity—birds, pest predators, and pollinators → better fruit formation.
- A second income—weekly bananas, firewood, fodder, and future timber—is met with organic/climate-smart market requirements.
- Carbon sinks

Gender triggers

Ask the group questions first, then reinforce:

- For the men here:
 - What would it mean for your coffee to hold a steady, good-grade harvest even in a hard, dry year—and to have timber growing as a long-term asset?
- For the women here:
 - What would shade and a cooler garden mean for your work?
 - What would weekly banana income and future timber mean for the family?
- For the Youth

- o What would it mean for your coffee to hold a steady, good-grade harvest even in a hard, dry year—and to have timber growing as a long-term asset?
- o What would weekly banana income and future timber mean for you?

Reinforce after the group responds

- Men: yield stability in dry seasons, improved quality, reduced risk of poor harvests, cooler air, and timber value.
- Women: shade comfort, sun protection for the crop, weekly banana income, and future timber income.
- Youth: yield stability in dry seasons, improved quality, reduced risk of poor harvests, cooler air, and timber value.

Part 3: Missed-income comparison (20 min)

Hold up the illustrated story poster and walk through the two farmers' experiences.

Run the interactive income calculation with a lead farmer from the group.

Simple math

1 acre of coffee = 450 trees

For each ecological zone, we anticipate 2 seasons.

- Season 1 = 2 Kgs per tree of FAQ
- Season 2 = 5 kgs per tree of FAQ

If a farmer has 2 acres

Their average income is (Number of trees x average kgs per tree x Price per kg) x 2 acres

- $(450 \times 3.5 \times 12000) \times 2 = \text{UGX } 37,800,000$

Ask the farmers

- Who has 2 acres?
- How much are they making at the end of every season?
- How much money are they leaving on the table? Each year
- How much have they left on the table for a 10 year period?

Engage them in discussion

- What is their 10-year plan
- Will they be able to achieve it with their current income?
- What do they need to do to achieve their plans?

Then the poster's link question and the goal question.

Ask

- In this situation, what will the farmer who skipped shade lose—this season, effects after this dry spell and every dry season after?
- If the right shade gave you a steadier, better-grade harvest and a second income, what is the one thing that extra money would go toward?

Part 4: Demonstrate + practise (30 min)

Before demonstrating

Ask

- Which trees do you already have on or near your farm and which bananas do you grow?

Let farmers name what they have first, then confirm or supplement from the recommended list.

State the guidelines aloud first (Annex 1): the recommended species, the spacing (about 20 m × 20 m for large trees), the height to keep (4–5 m), and pruning at the start of the rains.

Demonstrate in the garden, narrating each step:

- a. Choose a recommended species for the coffee type (see Annex 1) or use bananas for quick shade.
- b. Mark the spacing: pace or use a rope or tape to measure 30–30 meters on flat land between large shade trees by canopy size and 15m-15m on sloppy places.
- c. Plant the seedling well (good hole, firm soil, water if dry); plant shade a year before coffee where possible.
- d. On an existing shade tree: prune at the start of the rains to let in light and aim for moderate and even shade.
- e. Keep trees to about 4–5 m for aeration and easy management.
- f. Leave permanent trees (e.g., indigenous, deep-rooted, long-term canopy trees such as Mvule, Cordia, and Albizia) to grow—do not cut them in accordance with Climate-Smart Coffee and Sustainability guidelines

Farmers practise in pairs: each pair marks correct spacing for one tree and either plants a seedling or prunes one existing shade tree.

Agent checks 3 points and corrects kindly:

- Is the spacing right for the canopy (not too dense)?
- Is the species a recommended, non-competing one?
- Is the shade moderate and even after pruning (not too heavy and not too open)?

Common mistakes:

- planting trees too close (heavy shade)
- choosing competing or inappropriate species for the agro-ecological environment
- over- or under-pruning; cutting permanent (indigenous, deep-rooted, long-term canopy) trees that should be kept.

Note: Peer/ farmer version: demonstrate in the lead farmer's own coffee-banana garden, referencing how the coffee held up last dry season and the weekly income from the bananas and trees.

Part 5: Commit + agree monitoring (15 min)

This is a distinct step, not part of the demonstration. Every farmer leaves with a specific commitment.

- Each farmer states (or writes) how many shade trees (and/or banana suckers) they will plant, which recommended species, at what spacing, and by what date in the planting season; or which trees they will prune at the start of the rains.
- Agree as a group: Who will ask, "Who has planted or pruned their shade trees?"
- The facilitator records commitments and sets the follow-up date.

Bonus session: Questions and Answers (20 min)

In this session, the farmers can engage with the facilitators with their questions about any other CSC practices.

End of Session: "Give your coffee the right shade — it will keep your harvest and earn you a second income for years."

Annexes

1. Technical must-knows (MAAIF-aligned)

Remember the line: “Right species → space 20–40 m (about 20 × 20) → plant a year before coffee → keep 4–5 m tall → prune at the start of the rains → keep moderate shade.”

Must-know	Rule of thumb	Visual / demo cue
Species	Plant government-recommended, non-competing, long-lived, multi-use trees. Leguminous trees (Albizia) fix nitrogen. Bananas give quick shade + regular income. Note: Agronomist/ Extension Agent to confirm local availability.	Show the recommended-species list (below) and point to good examples in the garden.
Spacing	Space shade trees 30–30 m apart depending on canopy size — about 15 m × 15 m for large trees. Aim for moderate, even shade. The spacing depends on the trees species	Pace or use a rope or tape to mark the spacing at the demo tree. The Uganda Sustainable Coffee Toolkit Chart 2 - Manage your coffee tree canopy illustrates this.
Timing/ planting	Plant shade trees about one year before coffee, where possible, in the planting (rainy) season. Note: the Facilitator to confirm exact months per district (Buganda & Western).	Tied to the local rain calendar.
Height	Keep shade trees to about 4–5 m high for proper aeration and easy management.	Show the target height; point to a tree that is too tall.
Pruning	Prune regularly at the start of the rains to avoid excessive shade and keep the optimum shade ratio.	Demonstrate a pruning cut on an existing shade tree.
Permanent trees	Indigenous, deep-rooted, long-term canopy trees such as Mvule (<i>Milicia excelsa</i> (African Teak), Cordia (<i>Cordia africana</i> or Large-leafed Cordia / Mukebu), and Albizia (<i>Albizia coriaria</i> / Mugavu) should not be cut — leave them to grow.	Identify any permanent trees in the garden.
Why shade pays	It protects coffee from sun, rain, hail and wind; slows ripening (results in denser, better-grade beans); feeds soil via leaf litter. Beyond the farm-level benefits, this practice is a core requirement for entering premium markets under organic, Climate-Smart, and Sustainable coffee standards.	Compare a shaded versus sun-scorched tree. (Use photos that demonstrate this clearly.)
What NOT to do	- Do not plant trees too close (heavy shade results in reduced yield). Do not use competing or inappropriate species for your agro-ecological area. - Do not leave shade unpruned. - Do not cut permanent trees.	Physically show an over-shaded plot, then the corrected spacing. Alternatively, use photos that clearly demonstrate the point.

MAAIF Recommended Shade-Tree species

Ask farmers which trees they already have first, then match to the recommended species for their coffee type:

Robusta Coffee	Arabica Coffee
Mutuba (<i>Ficus natalensis</i>)	Charreada / Ekitooma (<i>Ficus natalensis</i>)
Mugavu, Musisa (<i>Albizia coriaria</i>) — nitrogen-fixing	Musisa, Murongo, Muyenzayenze (<i>Albizia coriaria</i>) — nitrogen-fixing
Mukunyu, Kabalira (<i>Ficus mucoso</i>)	Mukunyu (<i>Ficus mucoso</i>)
Note: Always check with the latest recommendations by MAAIF or NaCORI for approved species and spacing.	

Add a table with Regional trees

Below are tree species recommended for both regions from the sustainable tool kit.

- *Albizia coriaria*
- *Ficus mucoso*
- *Ficus natalensis*

Climate-smart Functions of Recommended Tree Species

6. Optimal Shade: Mutuba (*Ficus natalensis*)

These trees are fast-growing and have an easily controllable canopy that regulates farm microclimates. They produce wide, spreading, and dense branching systems that are easily pruned. Mutuba can be propagated easily from large cuttings, meaning a farmer gets immediate, rapid shade to shield young coffee bushes during dry spells.

7. Soil Fertility: Mugavu (*Albizia coriaria*)

Mugavu is the gold standard for climate-smart soil health in Ugandan coffee farming. It is an indigenous leguminous tree that forms a symbiotic relationship with soil bacteria to pull nitrogen from the air and fix it into the soil, acting as a free, organic fertiliser factory for the surrounding coffee. Its umbrella-shaped crown naturally creates a light, feathery shade structure. This allows sunlight to filter through without the need for constant, heavy pruning, while its shedding leaves create a nutrient-rich organic litter layer.

8. Food: Banana

Banana and coffee intercropping at the correct spacing is a climate-smart system: bananas give quick, moderate shade, regular income, and their trash feeds the soil while permanent shade trees mature. This is the picture that the poster's Farmer A shows.

Note: MAAIF handbooks explicitly warn farmers to avoid trees like

- Eucalyptus (which aggressively suck moisture out of the soil)
- Avocado (which acts as a host for the destructive Black Coffee Twig Borer)
- *Grevillea robusta* (which can sometimes attract unwanted pit sawyers onto the land).

Spacing-by-Canopy

MAAIF recommends a three-layer "sandwich" system to protect coffee farms from climate change.

9. The Bottom Layer (Coffee): Coffee bushes are planted at regular spacing—usually 10 feet by 10 feet for Robusta or 2.44 meters by 2.44 meters (8 feet by 8 feet) for Arabica.
10. The Middle Layer (Banana): Bananas are mixed into the coffee rows at a wider spacing, usually placing one banana plant for every four coffee bushes (20ft-20ft). Because bananas have shallow roots and big leaves, they provide quick shade and excellent mulch without diverting too much water from the coffee.

11. The Top Layer (Shade Trees): Large, deep-rooted local trees like Mugavu or Mutuba are planted far apart (about 30m to 30 meters apart. Their deep roots don't fight with the coffee for food, and their high branches create a light, filtered shade.

By spacing these three different plants correctly, the farm stays up to 3°C cooler, holds onto soil moisture much better, and keeps all three crops healthy and productive.

2. Commitment & follow-up

Commitment is a distinct step in the session (Part 5). During this engagement, utilize community structures, i.e., lead farmers, group leaders, internal inspectors, extension farmers, and cooperative agents to get commitments from the farmers.

Follow up visit checklist

- Have the pledged shade trees (and/ or bananas) been planted?
- Are recommended, non-competing species used?
- Is the correct spacing (moderate shade, not too dense) been used?
- Are existing shade trees pruned and about 4–5 m tall?
- Are permanent trees (i.e., indigenous, deep-rooted, long-term canopy trees) such as Mvule, Cordia, and Albizia left standing?
- Any myths or barriers encountered (e.g. “shade cuts yield”, or “no seedlings”)?
- Next follow-up date agreed?

12. Reinforcement kit

Shade trees illustrative story poster or video

Well-shaded garden ✓	Sun-scorched garden ✗
Coffee protected from sun, rain, hail and wind	Coffee burnt by the sun, and/ or battered by storms
Steady harvest even in a hard, dry season	Big losses in dry spells; unreliable income
Slower ripening → denser = better-grade beans	Heat stress → light = low-grade beans
Second income: bananas, firewood, timber, allows for more investment in the farm and better quality coffee = access to premium markets	No tree income; may fail Organic, Climate-Smart, Sustainable coffee premium markets
Leaf litter + nitrogen feed the soil = moist rich soil for better quality crops and higher yields.	Bare, exposed, eroding soil → poor quality crops and low yields = missed income

Poster integration tip: Use together with the Mulching, Manure and Trenching Illustrated Posters. Use alongside the Uganda Sustainable Coffee Toolkit.

Note: Confirm seasonal variations in the relevant district as timing differs in the different agroecological coffee-growing zones across Uganda.

4. Trainer preparation notes

This section is trainer preparation material — not plenary content.

Study Annex 4 before your session so you can answer objections confidently as they arise in Parts 1–2, especially the “shade cuts my yield” fear. This content is best covered in a Trainer-of-Trainers (ToT) session, not read aloud to farmers.

4.1. Barrier and enabler responses (COM-B framework)

The COM-B framework organises barriers into three domains:

- **Motivation:** beliefs about whether shade is worth it (fear it cuts yield, peer pressure, trees “take too long”).
- **Capability:** knowledge and skill (which includes species, spacing, height, and pruning).
- **Opportunity:** access to seedlings, labour, and land.

Barrier (what farmers say)	COM-B domain	Facilitator response
“Shade reduces my yield.”	Motivation	Too much shade does — that is why we use moderate shade at the right spacing (20–40 m) and prune at the start of the rains. Correct shade steadies your harvest in drought and improves your coffee quality grade. Point to a well-shaded champion’s garden whose coffee survived the dry season.
“I don’t know which trees or spacing.”	Capability	Use the MAAIF-recommended species for your coffee type; space 20–40 m by canopy size (about 20 × 20 m); keep trees 4–5 m; prune during the rainy season. We mark it out together in the demo so you can see it.
“I can’t get seedlings.”	Opportunity	Order recommended seedlings through the cooperative or a nursery as a group or raise your own from seed. Intercrop bananas for quick shade and regular income while the trees grow.
“Trees will compete with my coffee for water and nutrients.”	Motivation/ Capability	We choose non-competing, deep-rooted recommended species; leguminous trees (Albizia) feed the soil with nitrogen instead of consuming it, and leaf litter provides mulch and feeds the soil. Pruning keeps a balanced moderate shade.
“Trees take too long to give a benefit.”	Motivation	Plant shades a year before coffee where you can; intercrop bananas for quick shade and regular income while permanent trees (indigenous, deep-rooted canopy providing) mature into your timber asset.
“My neighbors don’t plant shade.”	Motivation	Look at the farmers whose coffee survives the dry season and who earn regularly from bananas and timber — that is the example. The practice is a core requirement for producing certified organic, Climate-Smart, and Sustainable coffee.

Note: Consider a dedicated Trainer of Trainers (ToT) session to build agents' confidence in handling barriers and objections. Agents who have practised responses out loud perform significantly better in the field than those who have only read a table.

Adaptation and gender notes

Reinforce after the participatory questions in Part 2, don't deliver as statements.

Group	Triggers to use
Men	Yield stability in dry seasons; improved coffee quality and market grade; reduced risk of poor harvests; cooler air; timber as a long-term asset and legacy.
Women	Shade comfort and a cooler garden to work in; sun protection for the crop; regular short and medium-term income from banana and timber
Youth	Nursery and seedling-sales enterprise; timber as a long-term asset; framing shade trees and coffee and banana intercropping as modern, Climate-Smart and Sustainable coffee production and comply with core requirements of premium markets. .

5. Facilitator self-check + M&E

5.1. Facilitator self-check (after each session)

Question	✓ / ✗
Did I open from the two gardens/ the farmers' own words, not a lecture?	
Did farmers talk more than I did in Parts 1-2?	
Did I answer every myth a farmer raised — especially “shade cuts my yield” — by name?	
Did I run the interactive income calculation with a Lead Farmer?	
Did I make the missed income concrete (lost coffee + second income from trees)?	
Did I show correct spacing and a pruning cut, not just describe them?	
Did I ask farmers which trees/ bananas they have before listing species?	
Did every farmer practise marking spacing and planting or pruning a tree?	
Did I use gender-specific trigger questions (not just statements)?	
Did each farmer commit (number, species, spacing, date)?	
Did I record commitments and agree on the VSLA check-in and follow-up date?	

3 or fewer ticks → review the session plan before the next training.

5.2. Adoption indicators (for SME M&E)

Indicator	Lead or Lag?
Number of farmers attending the session	Lead
Number of farmers making a specific commitment	Lead
% of farmers who have planted or pruned pledged trees at follow-up	Lag
Quality at follow-up (recommended species, correct spacing, pruned, 4–5 m)	Lag
Number of coffee and banana intercropping	Lag
Coffee condition in dry season (shaded versus Unshaded in the same area)	Lag
Number sourcing seedlings via cooperative, nursery or own nursery	Lag

Key

Lead versus Lag indicators

- Lead indicators: reach and intention are immediate (lead indicators).
- Lag indicators: planting/pruning uptake, quality, and dry-season coffee condition show real behaviour change; weight lag indicators more heavily when assessing module effectiveness in the pilot.