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Project: Regenerative Garden Ejisu Community Plot (5 m × 5 m)

A. Quick site context (assumptions)

- Plot size: ~5 m × 5 m (25 m²) can be scaled up/down.
- Climate context: tropical/Guinea savanna edge (warm, seasonal rains).
- Soil baseline: moderately fertile but compacted top layer (typical of small community plots).
- Goal: build living soil, increase biodiversity, provide food and biomass, capture carbon, and demonstrate low-input regenerative methods.

B. Plant selection (6 plants) names, short notes, and benefits

1. Moringa oleifera (Moringa / "drumstick tree")

- Why chosen: Fast-growing, deep roots, multipurpose (highly nutritious leaves, light shade, biomass from pruning).
- Benefits for soil/climate/people: Deep roots mine nutrients and help break compacted layers; frequent pruning provides high-nitrogen leafy mulch/green manure that feeds soil microbes and adds carbon to stable organic matter; edible leaves boost local nutrition; trees sequester carbon long-term.

2. Cajanus Cajan (Pigeon pea)

- Why chosen: Drought-tolerant, perennial/long-lived shrub legume that fixes atmospheric nitrogen.
- Benefits: Biological nitrogen fixation reduces need for synthetic fertilizers and builds soil N; provides flowers that attract pollinators; biomass (prunings) is good green manure and mulch.

3. Vigna unguiculata (Cowpea / black-eyed pea)

- Why chosen: Fast-growing edible legume groundcover.
- Benefits: Fixes nitrogen, covers soil to suppress weeds and reduce evaporation, provides edible pods for the community, and supports beneficial insects.

4. Ipomoea batatas (Sweet potato)

- Why chosen: Excellent groundcover, edible roots and leaves, protects soil from erosion.
- Benefits: Dense vine cover shades and cools soil, reduces erosion, adds organic matter when vines are cut and left as mulch, provides staple food.

5. Hibiscus sabdariffa (Roselle / local: sobolo source)

- Why chosen: Edible/marketable calyces (drink), attractive flowers, annual/short-lived shrub that supports pollinators.
- Benefits: Flowers attract bees and beneficial insects; biomass and leaf litter feed soil microbes; provides cash/food value to community.

6. Helianthus annuus (Sunflower) or Tithonia divers' folia (Mexican sunflower)

choose Tithonia if seeds/seedlings available locally.

- Why chosen: Fast-growing, high-biomass flowering plant.
- Benefits: Excellent "chop-and-drop" biomass (Tithonia especially), attracts pollinators, produces nutrient-rich green manure for compost, helps build bulk organic matter for soil carbon.

C. Why these plants work together (companion & functional design)

- Legumes (pigeon pea, cowpea) fix nitrogen and support neighboring heavy feeders (sweet potato, hibiscus).
- Moringa and pigeon pea provide vertical structure shade, mulch biomass, and support biodiversity.

- Groundcovers (sweet potato, cowpea) suppress weeds, protect soil moisture and reduce erosion.
- Flowering species (hibiscus, sunflower/tithonia) attract pollinators and beneficial insects (predators of pests).
- Rapid biomass producers (tithonia/moringa cuttings) feed compost piles or are used directly as mulch to feed soil organisms.

D. Three (plus) regenerative practices descriptions & benefits

1) Mulching & Chop-and-Drop (continuous organic cover)

What: Leave crop residues, prune moringa/pigeon pea and immediately spread the cuttings as mulch or chop tithonia into the soil surface. Cover bare soil with living or dead mulch (sweet potato vines, leaves).

How it improves soil & biodiversity: Mulch moderates soil temperature, reduces evaporation, prevents erosion, and feeds soil microbes as it breaks down. It fosters fungal and bacterial communities that stabilize soil aggregates and store carbon. Mulch also increases habitat for insects (including beneficial predators) and earthworms.

2) Legume integration & cover cropping (nitrogen-fixation)

What: Interplant cowpea and pigeon pea as living green manures between rows/patches of sweet potato and hibiscus; periodically cut and incorporate biomass or let it decompose on the surface.

How it improves soil & biodiversity: Biological N reduces need for synthetic fertilizer, improves plant growth, and feeds microbial communities. Cover crops also reduce weeds, suppress erosion, and provide floral resources for pollinators.

3) Compost systems + compost tea (closing the nutrient loop)

What: Build a small windrow or bin compost using kitchen scraps, plant prunings (tithonia, moringa leaves), and dry matter (straw, dry leaves). Use compost in planting holes and as a top dressing. Optionally brew compost tea to spray on plants as a microbial inoculant.

How it helps: Compost returns stable organic matter to soil, improves structure and water-holding capacity, supplies slow-release nutrients, and increases microbial diversity all essential for healthy, resilient soil and carbon storage.

4) No-dig / minimal tillage & lasagna bed layering

What: Avoid deep tillage. Build raised lasagna beds: layer cardboard (to suppress grass), wet organic matter, compost, and topsoil. Plant directly into the finished bed.

How it helps: Preserves soil structure and mycorrhizal networks, prevents carbon loss from oxidation, encourages earthworms and soil fauna, and gradually builds topsoil depth.

5) Water-harvesting & infiltration (micro-catchments / swales / mulched basins)

What: Shape small basins around trees, use mulch to slow runoff, and place simple contour berms or swales to keep rainwater on-site. Use rain barrels for irrigation during dry spells.

How it helps: Increases infiltration, reduces erosion, improves drought resilience, and helps maintain microbial activity and plant growth all improving long-term soil carbon and food security.

6) Diversity & habitat flower strips and hedgerows

What: Maintain a flowering strip (hibiscus, tithonia, sunflower) and a mixed-species hedgerow to provide continuous nectar and shelter for pollinators and predators.

How it helps: Increases beneficial insect populations, reduces pest outbreaks naturally (biocontrol), and supports broader biodiversity.

E. Planting plan & spacing (practical details)

- Moringa: 1 tree at the plot's north or west edge (to cast light shade without shading entire plot). Space: 2–3 m from center to nearby plants. Prune regularly to create usable biomass.
- Pigeon pea: 2–3 shrubs along the back or in corners as nitrogen banks and structural elements. Spacing: 1–1.5 m apart.

- Cowpea: interplanted as rows or scattered patches between sweet potatoes; sow thickly (30–40 cm between rows).
- Sweet potato: vines planted in mounds or beds; spacing 30–40 cm within rows, rows 60–75 cm apart. Use as living mulch.
- Hibiscus (roselle): 6–8 plants in a small block/flower strip (20–30 cm between plants).
- Tithonia / Sunflower: 6–8 plants along edges and near compost to attract pollinators; also used for chop-and-drop.

F. Simple text sketch / layout (5 m × 5 m)

Legend: M = Moringa, P = Pigeon pea, C = Cowpea, SP = Sweet potato, H = Hibiscus, T = Tithonia/sunflower, CC = compost/companion

Top (north)

[T] [T] [H][H][H] (flower strip)

[P] [SP][C][SP][C]

[M] central small path (0.5 m)

[P] [SP][C][SP][C]

[T] [T] [H][H][H]

Bottom (south)

Compost & rain barrel at SE corner

- Place Moringa (M) at the north-west corner (or one corner) to shade lightly and provide biomass.
- Pigeon peas (P) at back corners to act as nitrogen banks.
- Sweet potato (SP) covers ground in beds between shrubs.

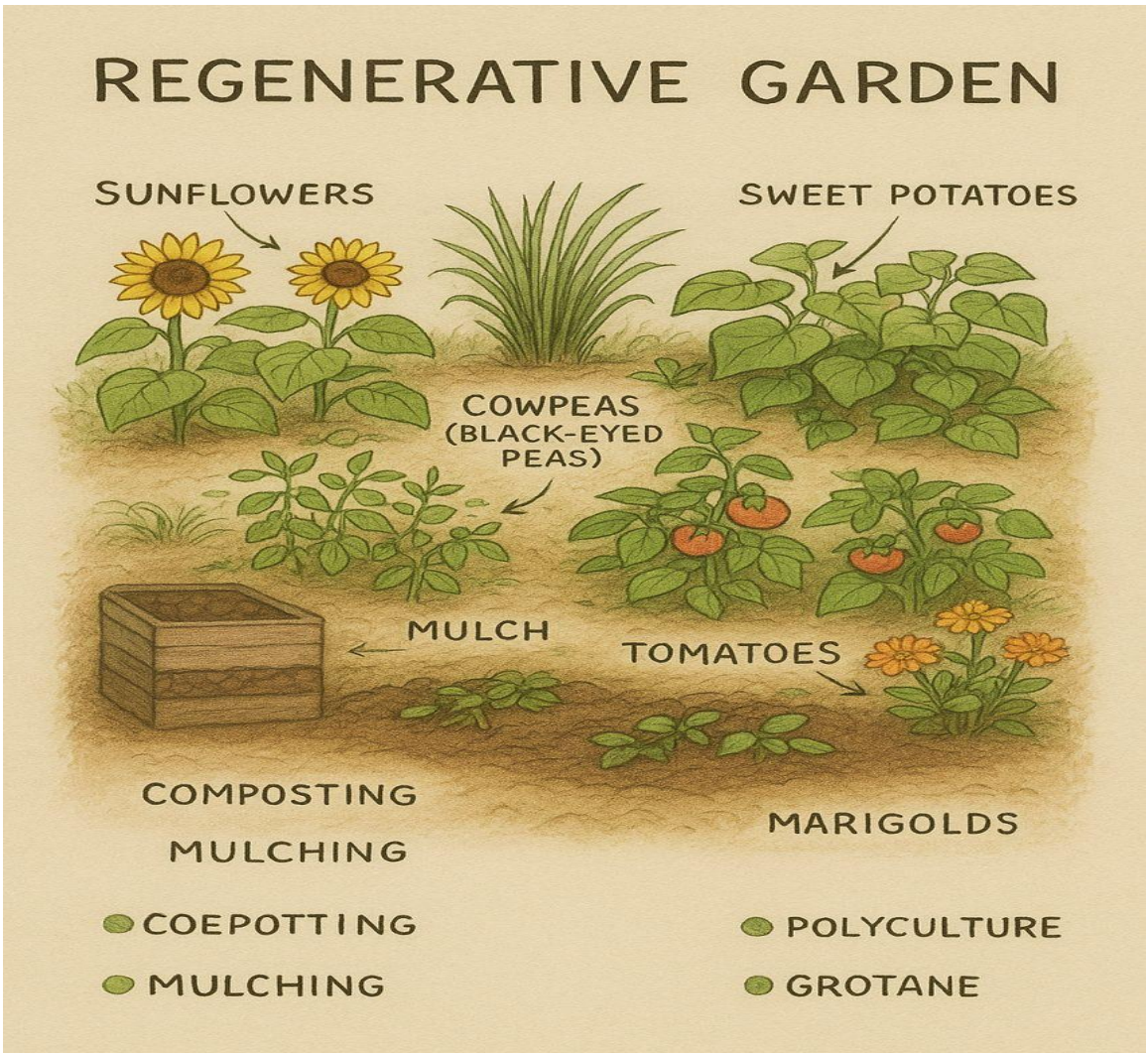
- Cowpea (C) interplanted as nitrogen groundcover.
- Flower strip (H + T) along one edge to attract pollinators; place compost pile on the sunnier corner near tithonia to speed green manure use.
- Leave a small 0.5 m central path for access and harvesting.

G. Year 1 timeline / maintenance (concise)

- Month 0 (setup): Build lasagna bed / remove grass with cardboard, add compost, plant moringa seedling, sow pigeon pea and cowpea, plant sweet potato slips, and place tithonia seedlings around compost. Install rain barrel and dig small mulched basins.
- Months 1–3: Mulch heavily; water regularly until established; side-dress with compost. Prune moringa/pigeon pea for first chop-and-drop at 3–4 months (small prunings).
- Months 4–12: Rotate chop-and-drop, remove seed heads for harvest (hibiscus, cowpea), maintain mulch, add compost annually, and keep flower strip blooming to maintain pollinators. Evaluate soil changes (structure, earthworms, moisture retention).

H. Expected impacts (what you'll achieve)

- Soil: Increased organic matter, better structure and aggregation, more earthworms and fungi, improved water-holding capacity, and reduced compaction.
- Climate: Increased carbon inputs into soil through biomass and root systems; reduced need for synthetic N (lower emissions).
- Biodiversity & people: More pollinators, beneficial insects, local food (leaves, legumes, tubers), and educational demonstration value for the community



“Turning a 5×5 m corner in Ejisu into a regenerative food garden mulched bed, nitrogen-fixing legumes, moringa for biomass, and pollinator flowers I’m most excited to see the soil come alive and feed our community. 🌱✨ #PGC2025 @turninggreenorg @eoproducts @rewildyourcampus @KissTheGround”