



Cacao and Coffee Comparison

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Coffee and Cacao Similarities / Differences

Similarities

- Both coffee and cacao are grown largely by **smallholder farmers** in Mindanao. da.gov.ph+2minda.gov.ph+2
- Both crops benefit from **agroforestry / shade or moderate-shade systems**, often integrated with other trees or forest cover, which helps maintain soil health, moisture, and biodiversity. Open JICA Report+2bimp-eaga.asia+2
- For both, **market demand and export / domestic consumption** make them high-value crops relative to many staples; they are considered “high-value” crops by national agriculture initiatives. Philstar.com+2minda.gov.ph+2
- Both require **post-harvest processing** (drying, fermentation/curing, grading) to produce market-ready beans — quality of post-harvest handling strongly affects final bean value. Open JICA Report+2USAID PDF+2

Differences

- **Maturity & yield tempo:** Coffee (especially robusta) can yield green beans earlier, after ~3 years, and under improved practices may reach ~1 metric ton/ha or more. SunStar Publishing Inc.+2BusinessMirror+2 Cacao tends to give lower per-tree yield; many smallholders in Mindanao report ~1.2–1.3 kg dried beans per tree per year under actual conditions. Scribd+2minda.gov.ph+2
- **Stability & productivity trend:** According to a 2025 study, cacao yield per hectare in Mindanao has **declined** over recent years (from ~0.4 t/ha to ~0.2 t/ha) despite more area planted. minda.gov.ph+1. For coffee, renewed support (e.g. by Nestlé Philippines along with local agencies) has raised yields significantly in many farms: some farmers reportedly boosted yield from ~300 kg/ha to ~900 kg/ha (even up to 1 t/ha), a three-fold increase. BusinessMirror+2Context.ph → Context.ph+2
- **Market demand and buyer infrastructure:** Coffee appears to have more established supply-chains, especially for Robusta (instant coffee, soluble) with demand from large firms, which provides more stable market access. Open JICA Report+2SunStar Publishing Inc.+2 For cacao, despite interest and rising global prices, many smallholders still struggle with post-harvest quality, soil/climate constraints, and weaker aggregation/processing infrastructure — limiting ability to reliably market high-value beans. minda.gov.ph+2bimp-eaga.asia+2



Comparison of Growing, Maintenance, and Production

Attribute / Phase	Robusta Coffee	Cacao
Tree / Plantation Establishment	Plant coffee seedlings; tree begins bearing in ~3 years (for Robusta). SunStar Publishing Inc.+1	Plant cacao seedlings/clones; tree bears pods after ~3–4 years, but yield and consistency vary. Scribd+1
Shade / Agroforestry Suitability	Coffee benefits from shade or agroforestry background; more flexible to intercropping. Open JICA Report+1	Cacao also compatible with shade/forest-like environment; thrives under partial shade and in agroforestry systems. bimp-eaga.asia+1
Maintenance / Management Needs	Requires pruning, weeding, fertilization, good agricultural practices to maximize yield; recent projects include training, improved inputs, regenerative soil care. BusinessMirror+2Context.ph → Context.ph+2	Requires soil fertility management, proper post-harvest (fermentation, drying), shade or soil conservation in sloped/upland areas, and good farm practices. minda.gov.ph+2USAID PDF+2
Typical Yield per Hectare	With improved practices: ~1,000 kg (1 t) per ha is a realistic target; some farms report ~1,200 kg green beans/ha. SunStar Publishing Inc.+2Philstar.com+2	Reported small-holder yield declining: ~0.2 t (200 kg) dry cacao beans per hectare in recent surveys. minda.gov.ph+1
Typical Yield per Tree	Varies by variety/management; robusta in poor farms may be low, but under good care yields increase. Historical data globally show robusta strong; local Philippine data yield per-tree often low without good care. Open JICA Report+1	Typical yield under older data ~1.3 kg dried beans per tree. Scribd+1 Industry hopes for 2–3 kg/tree under good practices. minda.gov.ph+1
Gross Revenue per Hectare (approximate, depending on yields & bean price)	Inspiration and Motivation If 1,200 kg/ha × bean price (example P84/kg local price) → ~P100,000+ gross income per hectare (for green beans) under good conditions. SunStar Publishing Inc.+1	Using 200 kg/ha (current average) at good bean price might give lower gross — but under optimized systems some projects report much higher profitability per hectare (see below) bimp-eaga.asia+1
Gross Revenue per Tree (approximate)	Hard to generalize (depends on tree spacing, yield). If farm ~1,200 kg/ha with e.g. 1,500 trees/ha → ~0.8 kg per tree (green bean) — rough.	At 1.3 kg dried beans per tree (older data), revenue depends on bean price; yield potential under good practice could double/triple.

Note on Cacao high-performance case: One recent project in Mindanao reported that, with improved soil and farm management, farmer-cooperators had **net incomes** of ~₱232,752 to ₱551,499 per hectare per year from cacao. [bimp-eaga.asia](#) Because “net income” is after costs, gross revenue in such cases likely was substantially higher (though cost breakdown isn’t publicly detailed).

Findings – What This Means for a Grower in Mindanao

- If you focus on **coffee (especially Robusta)** and adopt improved farm practices (good inputs, pruning, harvesting, possibly support from programs like Nestlé-GIZ Project Coffee+), coffee offers **faster returns** (after ~3 years) and potentially **higher and more stable yield per hectare** than typical smallholder cacao.
- **Cacao**, under many smallholder conditions, yields much lower per hectare — but **with good soil/farm management, attention to processing (fermentation/drying), and possibly access to better clones or agroforestry systems**, cacao can become **profitable** and may offer additional value through chocolate / bean-to-bar or specialty markets.
- The fact that cacao yield per hectare has declined over recent years in many Mindanao areas — **despite rising global demand and price** — suggests a structural challenge: soil fertility, farm management, and processing infrastructure must be addressed. On the other hand, coffee seems to benefit from renewed institutional support.
- From a risk-diversification standpoint, combining **coffee and cacao** (or using agroforestry / intercropping) may offer **hedging** — if one crop suffers (price drop, disease, weather) the other may compensate.

Summary & Recommendations

1. **For short-to-medium term return:** Coffee (especially Robusta) tends to be more reliable and faster-yielding. With current support programs, soils and climate in many Mindanao areas — including upland and lowland — suit coffee well.
2. **For long-term value and potential premium market:** Cacao could be worthwhile — but only if you invest in good agroforestry design, soil management, quality post-harvest processing, and possibly network with cooperatives or specialty buyers.
3. **Consider mixed/farm-level diversification:** Planting both coffee and cacao (and perhaps shade-trees / intercrops) may provide resilience against market fluctuations, climate risk, and biological challenges.
4. **Access institutional support & training:** Programs like Nestlé's coffee project show that yield improvements are possible. For cacao, soil-management and sustainable-agriculture interventions (as per recent projects) can raise yields and income dramatically. BusinessMirror+2bimp-eaga.asia+2
5. **Monitor quality, not just quantity:** For both coffee and cacao, bean quality, post-harvest practices, and traceability increasingly matter — especially if targeting domestic specialty markets or exports.

Economics

Key baseline data & assumptions

- Cacao: According to the national industry data, many cacao farms have **average yield ~ 1.3 kg dried beans per tree / year** under standard conditions. [Scribd+2PhilArchive+2](#)
- Some estimates/projected potential give up to ~ 2–3 kg/tree if properly managed and productive. [da.gov.ph+2da.gov.ph+2](#)
- Farmgate price for dried cacao beans recently in Philippines appears to be around **₱250–₱320/kg** (depending on region, quality, demand). [Selina Wamucii+1](#)
- Coffee (green beans): Recent data (2025) from PSA show farmgate price for Robusta green coffee beans ~ **₱265.75/kg**. [SunStar Publishing Inc.+1](#)
- Yield per coffee tree is more variable; in a recent survey many coffee farmers report **0.75–0.80 kg/tree/yr** under good conditions; but many also report far less: ~0.2–0.3 kg/tree in poorly managed or old farms. [Preprints+1](#)

BECAUSE THAT YIELDS AND PRICES VARY WE SHOW SCENARIOS FOR “LOW / AVERAGE / GOOD” YIELD LEVELS.

Per-Tree Gross Revenue Comparison

Crop / Scenario	Yield per tree (kg/year)	Price (₱/kg)	Gross revenue per tree (₱/yr)
Cacao – conservative	1.3 kg	280	~ ₱364
Cacao – moderate	2.0 kg	280	~ ₱560
Cacao – optimistic / managed good	3.0 kg	280	~ ₱840
Coffee – low yield (old or poorly managed)	0.2 kg	266	~ ₱53
Coffee – typical / modest yield	0.75 kg	266	~ ₱200
Coffee – above-average / well-managed	0.80 kg	266	~ ₱213

Interpretation:

Under typical conditions, a cacao tree generates **substantially higher gross revenue per tree** than a coffee tree — roughly **2–4x more** (₱360–840 vs ₱50–210), assuming average to good cacao yield. Even under moderate cacao yield (2 kg/tree), revenue per tree is more than double a well-managed coffee tree (0.8 kg/tree).

Important Caveats & Risks in Comparison

- Actual yield per tree for both crops fluctuates widely depending on age of tree, care, soil fertility, pests/diseases, and post-harvest handling.
- For cacao, reaching 2–3 kg/tree may require good variety/clone, adequate maintenance, pest/disease control, and proper pod/bean selection; many farms report much lower yield. da.gov.ph+2Scribd+2
- For coffee, yield per tree depends heavily on variety, age, pruning, fertilization, and overall farm management. Surveys show many trees produce only 0.2–0.3 kg/year under suboptimal conditions. [Preprints](#)
- Prices vary over time and with quality (e.g. bean grade, dryness, fermentation). Farmgate price may go up or down depending on supply-demand, seasonality, and market competition.

What This Means in Practice (for Farmers / Planners)

- If managed properly, **cacao offers higher per-tree gross revenue potential**. This makes it attractive especially on per-tree basis, which can be a strong incentive for smallholders.
- However, maximizing cacao's yield per tree requires **good agronomic practices, pest management, consistent maintenance, and careful harvesting/processing** to achieve 2–3 kg/tree.
- Coffee — while more stable and more familiar — may yield lower per-tree returns under many local conditions; but aggregated over many trees per hectare, and with good farm practices, coffee still remains viable and may be preferred if resources/management capacity for cacao are lacking.
- For small farms, considering **income per tree (not only per hectare)** can support decisions: e.g. mixing coffee + cacao; rotating; replanting; or using cacao where shade/intercropping is feasible for higher per-tree returns.





Planting Guide and Consideration

- **Coconut:** Primary canopy, $9 \times 9 \text{ m}$ ($\approx 123 \text{ trees/ha}$). Tall, deep-rooted.
- **Secondary canopy crops:** Coffee or cacao, which tolerate partial shade and need moderate spacing.
- **Goal:** Avoid root competition with coconut, ensure enough light for coffee/cacao, maintain air circulation, and allow maintenance access.

Planting Distance Guide for Jessie's Sunshine Farm

1. Cacao (*Theobroma cacao*)

- **Shade requirement:** Prefers **30–50% filtered sunlight**, can tolerate partial shade under coconut canopy.
- **Optimal planting distance:** $3 \times 3 \text{ m}$ to $3.5 \times 3.5 \text{ m}$ between cacao trees.
- **Calculation under square and triangle coconut grid:**

Coconut spacing	Cacao spacing	Trees per coconut “cell”
$9 \times 9 \text{ m}$ ($\approx 81 \text{ m}^2$ per coconut, square)	3.0 m in row	6 cacao trees per coconut square (3 m row distance inside each coconut square, (2 interlines but not in line))
$9 \times 9 \text{ m}$ ($\approx 70 \text{ m}^2$ per coconut, triangle)	3.0 m in row	6 cacao trees per coconut square (2.6 m row distance inside each coconut triangle, (2 interlines but not in line))

2. Robusta Coffee

- **Shade requirement:** Moderate shade preferred, tolerates up to 50% filtered sunlight.
- **Optimal planting distance:** $2 \times 2 \text{ m}$ to $2.5 \times 2.5 \text{ m}$ between coffee trees.
- **Calculation under $9 \times 9 \text{ m}$ coconut grid:**

Coconut spacing	Coffee spacing	Trees per coconut “cell”
$9 \times 9 \text{ m}$ ($\approx 81 \text{ m}^2$ per coconut, square)	2.25 m in row	8 coffee trees per coconut square (3 m row distance inside each coconut square, (2 interlines but not in line))
$9 \times 9 \text{ m}$ ($\approx 70 \text{ m}^2$ per coconut, triangle)	2.25 m	8 coffee trees per coconut square (2.6 m row distance inside each coconut triangle, (2 interlines but not in line))

Recommendation: staggered both trees within the coconut square for air circulation, maintenance, and adequate sunlight.

Practical Layout Tips

1. **Stagger the secondary crop rows** relative to coconut trunks to minimize shading dead spots and root crowding.
2. **Leave a 3 m access lanes** every few rows for harvesting, pruning, and pest management.
3. **Consider mixed planting:** Alternate cacao and coffee in the same coconut square for diversification and staggered income streams.
4. **Soil & fertilizer management:** Coconut roots are deep, cacao/coffee shallow. We must ensure supplemental fertilization for secondary crops.



Key Observations

- Both crops require **careful maintenance** (weeding, pruning, pest management) and **controlled post-harvest** steps to ensure quality.
- **Cacao** has a longer, more sensitive post-harvest process (fermentation of pods) compared to coffee, which can tolerate dry processing but is also quality-sensitive.
- **Robusta coffee** tends to produce **green beans** that are sold immediately after drying and hulling, whereas **cacao beans** require fermentation **before drying**, which is labor-intensive but crucial for flavor.
- **Shade and intercropping:** Both benefit from partial shade under coconut or other trees, but cacao is more shade-tolerant than Robusta coffee.



Production Steps: Cacao vs Robusta

Production Stage	Cacao (<i>Theobroma cacao</i>)	Robusta Coffee	Key Considerations
Land Preparation	Clear undergrowth, maintain partial shade, prepare raised/flat beds, incorporate organic matter	Clear weeds, prepare planting holes, amend soil with compost/fertilizer	Both benefit from agroforestry; avoid soil compaction
Planting	Plant seedlings or grafted clones; spacing 3 x 3 m (or 3 x 2.6 m)	Plant seedlings; spacing 2.25 x 3 m under coconut or shade	Ensure seedlings are disease-free; plant during rainy season
Shading / Canopy Management	Maintain 30–50% sunlight; prune shade trees	Moderate shade preferred; prune coffee and shade trees	Stagger planting to avoid excessive shading and competition
Fertilization / Soil Care	Organic + inorganic fertilizer; mulch to conserve moisture; soil test annually	Balanced NPK, organic matter, occasional foliar spray	Soil fertility critical for yield; cacao more sensitive to nutrient imbalance
Weeding / Ground Maintenance	Manual or mechanical weeding; mulch reduces weeds	Regular weeding; cover crops can reduce weeds	Both crops benefit from mulching to retain soil moisture
Pruning / Canopy Management	Prune old, dead, diseased branches; maintain 2–2.5 m tree height for harvesting	Prune lateral branches to improve sunlight penetration and airflow	Proper pruning reduces disease, improves pod/bean quality
Pest / Disease Control	Black pod, mirids, termites; integrated pest management (IPM)	Coffee berry borer, leaf rust, nematodes; IPM	Regular monitoring critical; early intervention reduces losses
Flowering / Pollination	Hand or natural pollination; flowers ~3–4 yrs after planting	Flowers ~3 yrs after planting; self-pollinating	Flower set determines yield; cacao flowers delicate, need pollinators
Harvesting	Pods harvested manually when ripe (every 1–2 weeks)	Cherries harvested manually or mechanically when red/ripe	Frequent harvesting ensures high-quality beans
Post-Harvest / Processing	Pod breaking → ferment 5–7 days → sun or mechanical drying to 6–7% moisture → sorted & bagged	Pulped & fermented (wet or dry process) → washed → sun or mechanical drying → hulled → green beans sorted & bagged	Fermentation critical for flavor; drying moisture affects storage and quality
Storage / Transport	Store in ventilated, dry sacks; avoid humidity	Store green beans in dry, ventilated area; maintain moisture 10–12%	Both sensitive to mold; maintain traceability if targeting specialty markets
Finished Product	Dried fermented cacao beans, ready for sale / chocolate processing	Green coffee beans, ready for roasting / sale	Farmgate price depends on quality, fermentation, drying, bean grade

Drying Process: Cacao vs Robusta Coffee

Step / Aspect	Cacao (Dried Fermented Beans)	Robusta Coffee (Green Beans)	Notes / Key Considerations
Timing / Start Point	After fermentation (typically 5–7 days in boxes/baskets)	After pulp removal (wet process) or harvest of cherries (dry process)	Beans must be sufficiently fermented (cacao) or depulped (coffee) before drying
Initial Moisture Content	~60% moisture immediately after fermentation	Wet-processed coffee: ~60% moisture; Dry-processed coffee cherries: ~50–60%	High moisture content must be reduced gradually to avoid mold or fermentation issues
Drying Method	Sun drying on racks, mats, or concrete floors; sometimes mechanical dryers if available	Sun drying on raised beds, patios, or mechanical dryers	Sun drying is most common in Mindanao; mechanical dryers shorten drying time and improve quality
Layering / Turning	Spread beans in thin layers (~5–10 cm); turn beans 2–3 times daily	Spread beans in thin layers (~3–5 cm for coffee); rake/turn regularly	Turning ensures uniform drying, prevents mold growth, and preserves flavor
Duration	Typically 5–7 days , depending on sunlight intensity and weather	Wet process: ~5–7 days; Dry process: up to 2–3 weeks depending on sun exposure	Avoid over-drying (beans crack) or under-drying (risk of mold, fermentation)
Final Moisture Content	~6–7% moisture	~10–12% moisture	Critical for storage; cacao slightly lower moisture than coffee to prevent spoilage
Indicators of Proper Drying	Beans feel hard , break with snap , slight sheen	Beans hard , brittle , no sticky pulp	Check with hand or moisture meter if available
Post-Drying Handling	Beans are sorted, bagged, stored in ventilated, dry sacks	Beans husked / hulled (if wet process) then sorted and bagged	Store in cool, dry, ventilated conditions; avoid humidity and pests



Key Differences

1. **Moisture target:**
 - a. Cacao: ~6–7% (lower than coffee, more sensitive to mold).
 - b. Coffee: ~10–12% for green beans.
2. **Post-fermentation requirement:**
 - a. Cacao must be **fermented first**, otherwise drying will not develop chocolate flavor.
 - b. Coffee can be dried immediately after de-pulping (wet process) or directly from cherries (dry process).
3. **Layer thickness and turning frequency:**
 - a. Cacao layers are thicker (5–10 cm) and turned less frequently (2–3x daily).
 - b. Coffee layers thinner (3–5 cm) and turned more frequently to speed drying and prevent fermentation in wet beans.
4. **Equipment options:**
 - a. Both benefit from sun-drying, but mechanical dryers can reduce weather risk, speed up the process, and improve uniformity.

Practical Tips for Farmers

- **Avoid rain exposure:** Cover beans with tarps or move under shed if sudden rain occurs.
- **Monitor daily:** Turn beans at least twice for cacao, 3–4x for coffee, more if sun is strong.
- **Check moisture:** Hand feel test or portable moisture meter ensures beans reach correct final moisture.
- **Storage readiness:** Once dried, beans must be **cooled and bagged** in ventilated sacks to prevent condensation and mold. **Need of cooling facility.**