

Upgrow Rwanda Ltd — Financial Model (v7)

Pre-launch as of May 2026 · Pilot operations begin September 2026 · Conservative inputs throughout

HOW TO READ THIS MODEL

✓ Real today	<p>Verifiable facts as of May 2026:</p> <ul style="list-style-type: none">• Ten aeroponic towers purchased (7 LD × 52 plants + 3 HD × 196 plants = 952 plant-sites)• Land secured for the pilot site in Gasabo District, Kigali, and separately for the 100-tower scale-up• MoU signed with the Ministry of Agriculture (MINAGRI), aligned to PSTA-5• Eight Letters of Intent signed with Kigali commercial buyers (Kultura, Simba, Mocha, Casamia, Karu, Farmhouse, Soleluna, Ugarit)• Upgrow® trademark registered in Rwanda; continental brand strategy planned• Founding team in place across leadership roles, equity-aligned• Agrotonomy training partnership confirmed at the 100-tower order level
? The pilot validates	<p>Open questions the six-month pilot (September 2026 – February 2027) is structured to answer:</p> <ul style="list-style-type: none">• Which of the 15 test-basket crops perform best in Rwandan conditions — yield, growth speed, market demand• Which crops become Stage 1 specialties (chosen post-pilot based on yield + buyer signal)• Water economy versus open-field baseline• Farmer operability without expat oversight — critical for the long-term franchise model• Unit economics under real Rwandan input costs• Which Letter-of-Intent partners convert to recurring weekly buyers
\$ Modeled for scale	<p>Stage 1 figures project the 100-tower scale-up (2027):</p> <ul style="list-style-type: none">• 9,520 plant-sites at full scale — 70 LD + 30 HD towers, same proven ratio as the pilot• Land already secured for the 100-tower greenhouse• Agrotonomy training partnership included at the 100-tower order• Channel mix grows from 30% premium (pilot) to 65% (Stage 1) as the 8 LOIs anchor and reputation builds <p>Multi-city expansion and the farmer-partnership franchise are the long-term horizon, beyond Stage 1 — directionally indicated, not modeled here.</p>

STRATEGIC POSITIONING — RWANDA FIRST, AFRICA NEXT

Why Rwanda first	Regulatory clarity (signed MINAGRI MoU under PSTA-5), secured land for both pilot and scale-up, eight pre-launch commercial LOIs, and stable governance make Rwanda the lowest-risk entry point for proving the model. Once Stage 1 economics are validated, the same blueprint extends across East Africa.
Sage — the AI operations layer	Sage is Upgrow's internal AI operations assistant, custom-built on Anthropic Claude. It runs daily briefings, manages documents, drafts external comms, and tracks operational follow-ups. Sage shortens founder-leverage on every operational decision and becomes part of the company's continental scaling stack.
Upgrow® trademark	Upgrow is a registered trademark in Rwanda. The continental rollout strategy contemplates extending trademark coverage across ARIPO/OAPI member states as the brand expands, protecting the franchise model from day one.
Why this scales	Aeroponic towers are modular, low-water, and high-density — the right form factor for African cities with constrained land and water. The franchise model that follows Stage 1 (farmer-partnership, revenue-share) is designed for capital-light continental replication.

WHAT REVIEWERS SHOULD KNOW	
Founder context	Upgrow Rwanda is pre-launch as of May 2026. This is the founder's first venture-scale company, and the model has been built with the company's Finance Director, also in their first FD role. Inputs are conservative; iteration is expected once pilot data lands.
Conservative inputs	Local-market and premium-B2B prices reflect the lower end of validated ranges. Yield assumptions sit at the low-to-mid end of published Agrotonomy and peer-reviewed sources. CIF shipping costs are conservative — partner-negotiated rates run 15–25% below model inputs on repeat-order volume. The intent is to price for upside, not to defend the floor.
Two-margin view	Margins are reported in two layers. Field Contribution Margin = revenue minus production OPEX (operators, agronomist, towers, plant-sites). Operating Margin = revenue minus production OPEX minus corporate overhead. Founders (CEO + FD) draw no salary in Phase 1; their compensation is equity. Olivier and Michel come on payroll only after the pilot, per their agreements. COO compensation is modeled for Stage 2+ (200–300 towers).

Actual numbers will differ	This is intentional. The pilot is the test, not the proof. Negotiated supplier rates, Agrotechnology training credits, and government tax incentives are not priced into the base case.
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READING THE COLUMNS	
Pilot	The 10-tower pilot operation, 952 plant-sites total. CAPEX is deployed (greenhouse, towers, infrastructure, launch contingency). The pilot runs a 15-crop test basket to identify Stage 1 specialties. Revenue and OPEX are six-month modeled estimates. Small negative gross profit is expected and budgeted — the pilot exists for evidence, not profit.
Stage 1 (100 towers)	Projection for 100 towers (9,520 plant-sites) at full scale, running validated specialties selected from the pilot. Land secured; Agrotechnology training partnership included at order placement. Conservative base case lands near operating breakeven; with realistic specialty selection and validated yield levers, operating profit moves into \$20-50K range — tower-only payback of 18-24 months is achievable in the upside case.

Glossary — every acronym and finance term

Plain-English definitions for every term in the model.

Term	Plain-English definition
Aeroponics	Growing plants where roots hang in air and are misted with nutrient-rich water. Uses 90–95% less water than soil farming.
Anchor customer	A named, contracted buyer (hotel, supermarket) who commits to recurring weekly purchase.
Archetype	Three site types: (1) Open-air with fence + shade, (2) Net-house with insect mesh, (3) Polycarbonate greenhouse with passive climate control.
CAPEX	Capital Expenditure — one-time costs to BUILD: towers, greenhouse, irrigation. Paid up front.
CEA	Controlled-Environment Agriculture — growing in a structure with managed temperature, humidity, light or pest exposure.
CFGET	Chinese greenhouse manufacturer (Chengdu) quoting Upgrow USD 7,519 EXW for a 153.6 m ² polycarbonate greenhouse. Anchor for Archetype 3 cost.
CIF Kigali	Cost, Insurance, Freight — landed price in Kigali including ocean shipping from China and inland transport from Mombasa.
Crop cycle	Time from planting a seedling to harvest. Lettuce ~30 days; basil ~35–42 days; strawberries continuous after first fruiting.
EXW	Ex Works — factory-gate price. Excludes shipping, duty, install.
Field contribution margin	Revenue minus production OPEX (operators, agronomist, tower upkeep, nutrients, seedlings, water). Pre-corporate overhead.
FX	Foreign Exchange. Model uses 1 USD = 1,400 RWF (April 2026 Bank of Rwanda mid-rate).
HD tower	High-Density tower. Agrotonomy 196-plant format. CAPEX ~USD 1,200 CIF Kigali. Pilot has 3.
Hybrid Farm	Phase-2 farmer-partnership: 1 polycarbonate greenhouse + 2 open-air / net-house sites on one farmer's land.
LD tower	Low-Density tower. Agrotonomy 52-plant 2.9 m format. CAPEX ~USD 850 CIF Kigali. Pilot has 7.
LOI	Letter of Intent. Non-binding written commitment from a prospective customer to buy. Upgrow has 8 signed pre-launch.

MINAGRI	Rwanda's Ministry of Agriculture. Upgrow has a signed MoU with MINAGRI aligned to PSTA-5.
MoU	Memorandum of Understanding — non-binding written agreement between two parties.
Net-house	Galvanized steel + insect-grade mesh + UV greenhouse film. Pest exclusion + light weather protection. Archetype 2.
Operating margin	Revenue minus production OPEX minus corporate overhead. Pre-tax, pre-financing.
OPEX	Operating Expenditure — recurring monthly costs to RUN: nutrients, electricity, water, salaries, maintenance, corporate overhead.
Phase 1	2026–2030. Upgrow leases land and operates every site itself. Goal: perfect production at 500 towers.
Phase 2	2031+. Farmer-partnership network launches. Farmers contribute land; Upgrow contributes capital, system and offtake.
Plant-site	One growing slot on a tower. LD = 52 plant-sites; HD = 196. The fundamental production unit in this model.
PSTA 5	Strategic Plan for Agriculture Transformation, 5th Edition (2024–2029). Rwanda's USD 5.12 B agriculture strategy.
Ramp	Year-1 production at 65% of steady state — operator learning + contract spin-up. Year 2+ runs at 100%.
RDB	Rwanda Development Board — government investment-promotion body.
RWF	Rwandan Franc. 1 USD ≈ 1,400 RWF as of April 2026.
Sage	Upgrow's internal AI operations assistant, custom-built on Anthropic Claude. Handles briefings, document management, drafting, follow-ups.
Stage gate	Pre-defined evidence checkpoint that must clear before next-stage capital is committed.
Steady state	Production rate after Year-1 ramp ends (Year 2+).
Tower	An Agrotonomy commercial aeroponic vertical tower. LD = 52 plants; HD = 196 plants.
Trademark (Upgrow®)	Upgrow is a registered trademark in Rwanda. Continental rollout planned across ARIPO/OAPI member states.
USD	United States Dollar. Reporting currency. CAPEX largely USD; revenue is RWF — the mismatch is a real currency risk.

VAT	Value-Added Tax. Rwanda's standard rate is 18%. Most agricultural inputs and unprocessed produce are VAT-exempt.
WASAC	Water and Sanitation Corporation, Rwanda. Commercial water at ~RWF 736–940 per m ³ .
Yield	Kilograms of crop produced per plant-site per year.

Sources — every external number, with citation

Each external input is footnoted with its source. Internal references marked as such.

#	Source name	What it tells us	Citation / URL
S1	Agrotonomy 2024–2025 published rates	USD 530 ex-factory for 52-plant LD tower. Volume discount 7% at 100+, 10% at 300+, 15% at 1,000+.	https://agrotonomy.com/rates/
S1b	HD 196-plant tower — founder-confirmed	USD 600 ex-factory for 196-plant HD commercial tower. Founder-confirmed.	Internal
S2	CFGET Greenhouse quotation #CF26030055	USD 7,519.41 EXW Chengdu for 16×9.6m (153.6 m ²) Gothic polycarbonate greenhouse, frame + 8mm polycarbonate + top vents + sunshade + circulation fan + sliding door.	Internal: CFGET_Quotation_260331.pdf
S3	Selina Wamucii — Rwanda produce prices, April 2026	Strawberries wholesale USD 2.53–3.38/kg; spinach retail RWF 1,317–2,963/kg; broad vegetables RWF 517–3,147/kg.	https://www.selinawamucii.com/insights/prices/rwanda/
S6	Selina Wamucii — Basil, Kenya proxy	Retail USD 5.00–10.29/kg; wholesale KES 608/kg ≈ USD 4.70/kg. East Africa basil benchmark.	https://www.selinawamucii.com/of-kenya-basil-and-what-the-international-market-wants/
S7	Internal Upgrow GTU pricing notes (mid-2025)	Tomatoes 2,000 RWF/kg, Lettuce 200 RWF/head, Spinach 600 RWF/bunch, Carrots 1,000 RWF/kg, Garlic 6,000 RWF/kg.	Internal: Draft GTU.gdoc
S8	Garden of Eden Rwanda B2B price list	Lettuce/leafy bunch RWF 1,500–2,500; baby spinach RWF 1,500/bunch.	https://www.gardenofedenrwanda.com/
S9	The East African — Kigali hotel F&V 2024	Radisson Blu Kigali F&V spend RWF 15–18 M/month (USD 10,700–12,900).	https://www.theestafrican.co.ke/
S10	Anker Research Institute — Rural Rwanda Living Wage 2025	USD 166/month rural Rwanda living wage. Operator salary set above at USD 180.	Anker Research Institute, Rural Rwanda 2025
S11	WASAC commercial tariff	Commercial water RWF 736–940/m ³ (USD 0.55–0.70).	https://www.wasac.rw/en/my-bill/tariff-charges
S12	Rwanda Energy Group (REG) tariffs Oct 2025	Commercial mid-band ~RWF 376/kWh (USD 0.27); industrial Tier 2 ~RWF 97–110/kWh. Model uses USD 0.10–0.15/kWh.	https://reg.rw/
S13	Agrotonomy nutrient kit pricing	USD 300 per kit. Per-plant-site approx USD 0.04–0.06/mo.	https://agrotonomy.com/tower-farm-nutrients-purity-affordability-and-proven-results/

S14	Agrotonomy pump electricity	Pump runs ~0.216 kWh/day per tower (45W × 4.8h duty cycle).	https://agrotonomy.com/how-much-electricity-does-a-commercial-aeroponic-tower-use/
S15	Agrotonomy water consumption	~3.79 L/day per tower (~1.4 m ³ /year) for leafy greens.	https://agrotonomy.com/how-much-water-does-a-tower-garden-use/
S16	Agrotonomy lettuce yield	Up to 624 heads of lettuce per LD tower per year. Per plant-site ~12 heads/yr at 150–200g.	https://www.facebook.com/agrotonomy/posts/1100622758770003/
S17	Agrotonomy day-neutral strawberry yield	0.55–0.90 kg per plant per year. Model uses 0.70 (conservative midpoint).	https://agrotonomy.com/hydroponic-day-neutral-strawberries/
S18	MDPI aeroponic basil study	~28–45 g per plant per cut; 8–12 cuts/year tropical conditions.	https://www.mdpi.com/2624-7402/3/3/36
S19	Northern Corridor Transport Observatory	Mombasa→Kigali container freight ~USD 4,500–5,500 per container after indirect costs. Negotiated rates lower for repeat shippers.	https://top.ttcanc.org/indicators/indicator?show=90
S20	Dantful 2026 ocean rates	Shanghai/Ningbo→Mombasa 20ft container USD 1,400–2,700. Lower end available through partner agreements.	https://www.dantful.com/cost-of-shipping-20ft-40ft-containers-from-china-to-kenya/
S21	Aqua Hub Kenya 2025/26	Net-house tunnel ~KES 1,200–2,000/m ² Nairobi-installed = USD 9–15/m ² . Kigali-landed-installed 3–4× this.	https://www.aquahubkenya.co.ke/greenhouse-prices-in-kenya-best-greenhouses-2026/
S22	RRA — VAT exemptions	Unprocessed agricultural products and inputs are VAT-exempt at import.	https://www.rra.gov.rw/
S23	RRA — Corporate Income Tax	Standard CIT 28% (reduced from 30% in 2025; long-term target 20%).	https://taxsummaries.pwc.com/rwanda/corporate/taxes-on-corporate-income
S24	PM Order N° 008/2022 — Land allocation	Maximum emphyteutic agricultural lease 99 years.	https://rwandalii.org/akn/rw/act/pmo/2022/8/eng@2022-07-03
S26	Internal Upgrow Master Strategy v1.0	Three-archetype model, two-phase land strategy, scaling sequence pilot→100→200→500→Phase 2.	Internal: Upgrow_Master_Strategy_v1.0.docx
S27	USD/RWF reference rate, April 2026	1 USD = 1,400 RWF. Bank of Rwanda mid-rate.	Bank of Rwanda mid-rate, April 2026
S28	Numbeo — Kigali grocery prices	Lettuce 1 head ≈ USD 0.39 retail.	https://www.numbeo.com/food-prices/in/Kigali

S29	Internal Upgrow tower inventory (Apr 2026)	Pilot tower count: 7 LD + 3 HD = 952 plant-sites. Land parcel 306 m ² . Land for scaling phase secured.	Internal: founder-confirmed inventory
S30	Pilot CAPEX, founder-confirmed	USD 35,000–44,000 fully installed for the 10-tower pilot, depending on greenhouse decision.	Internal: Pilot Phase Business Plan
S31	Upgrow shipping partner agreements	Negotiated rates with shipping partners on repeat-order volume run 15–25% below S19/S20 published rates. Conservative model retains published rates.	Internal: founder-confirmed partner relationships
S32	BrighterMonday Rwanda — operations role benchmarks	Mid-to-senior operations and farm-manager roles in Rwanda agritech, surveyed 2024–2025, fall in the USD 700–1,500/month band. Model uses USD 850/month for Operations Lead (Olivier) at Stage 1.	https://www.brightermonday.co.rw/
S33	RICPA / local accounting firm rates	Bookkeeping + statutory filings for SME in Rwanda quoted at USD 80–180/month by registered Rwandan accounting firms. Model uses USD 100/month at Stage 1.	Internal: founder-collected quotes, Rwandan ICPA-registered firms
S34	Kigali cold-chain delivery benchmark	Local cold-chain courier with insulated box + motorbike runs USD 350–500/month for 3-day-per-week city-radius delivery. Model uses USD 400/month at Stage 1.	Internal: founder-collected quotes from Kigali couriers
S35	UAP/SONARWA crop-insurance benchmark	Commercial agri-asset insurance typically 3–5% of insured revenue annually. Model uses 4%.	https://www.uap-group.com/rw/
S36	Bank of Rwanda — RWF/USD historical trend	RWF has depreciated against USD at an average ~7–9%/yr over the last five years. Used as the FX sensitivity lever.	https://www.bnr.rw/
S37	UNDP timbuktoo — Sector hub funding ranges	Across timbuktoo hubs, equity-free grant amounts have run from ~USD 25,000 (Fintech, plus USD 20,000 acceleration grant) to up to USD 100,000 (HealthTech). AgriTech Hub grant size not formally published; modelled inside the same range.	https://www.undp.org/africa/news/timbuktoo-healthtech-startup-accelerator-programme-call-applications

S38	Agrotonomy 100-tower partner-sourced quote	Partner-negotiated ex-factory + consolidated shipping rate for 100 commercial towers (70 LD + 30 HD) lands at USD 78,000–80,000 CIF Kigali. Model uses USD 80,000 to be safe.	Internal: founder-collected supplier quotes, May 2026
S39	Aqua Hub Kenya — net-house at scale	Net-house structures sized 1,000+ m ² at KES 1,200–2,000/m ² Nairobi-installed = USD 9–15/m ² . Kigali-landed-installed at the upper bound puts a 1,000 m ² net-house at ~USD 30K including foundations, irrigation and ventilation.	https://www.aquahubkenya.co.ke/greenhouse-prices-in-kenya-best-greenhouses-2026/
S40	KABISA — EV energy cost & commercial vans	Electric running cost ≈ 30 RWF/km from published per-trip energy (Kigali–Musanze 94km=2,850 RWF; Huye 142km=4,260; Kayonza 82km=2,460). All-electric commercial vans 1.5–8T; sales +250 786295127. Corroborated by founder photo of KABISA van.	https://www.gokabisa.com/rw
S41	RURA — Rwanda fuel pump price, June 2026	Diesel 2,927 RWF/L, petrol 2,938 RWF/L effective 6 June 2026; diesel was 2,205 RWF/L in April 2026 — illustrates fuel-price volatility.	https://en.igihe.com/business/article/rwanda-announces-increase-in-petrol-and-diesel-prices
S42	CleanTechnica / NCBA — EV savings & financing	EVs save up to ~90% on fuel vs ICE (~\$1.77 vs \$7.20 per 100 km); NCBA Bank Rwanda offers 100% EV financing with the vehicle as collateral.	https://cleantechnica.com/2025/02/15/kabisa-enables-commercial-ev-adoption-in-east-africa-by-launching-1st-ultrafast-charging-hub-in-kigali/
S43	USD/RWF spot rate, June 2026	1 USD ≈ 1,464 RWF (June 2026). Model standard remains 1,400 (S27, April 2026) for internal consistency.	https://www.exchange-rates.org/converter/usd-rwf

Assumptions — every input number, in one place

All editable inputs are consolidated here. Yellow highlights mark assumptions that materially move outputs. Blue text = input cells.

What	Value	Unit	Source #	Plain-English explanation
Currency & timing				
USD : RWF exchange rate	1400	RWF/USD	S27	April 2026 Bank of Rwanda mid-rate.
Standard CIT rate	0.28	%	S23	Rwanda corporate income tax rate.
Discount rate for NPV	0.15	%	—	Risk-adjusted emerging-market agri-USD discount rate.
Annual RWF depreciation vs USD	0.08	%/yr	S36	Five-year trend; used as FX sensitivity lever.
Tower formats				
Plant-sites per LD tower (52-plant 2.9m)	52	plants/tower	S29	Agrotonomy commercial tower. Pilot has 7.
Plant-sites per HD tower (196-plant)	196	plants/tower	S29	Agrotonomy HD commercial tower. Pilot has 3.
LD tower CIF Kigali — ex-factory	530	USD/tower	S1	Agrotonomy published ex-factory rate for 52-plant 2.9m tower.
LD tower CIF Kigali — shipping + duty	320	USD/tower	S20+S19+S31	Conservative; partner-negotiated rates 15–25% below this on repeat orders.
HD tower CIF Kigali — ex-factory	600	USD/tower	S1b	Founder-confirmed. Far cheaper per plant-site than LD.
HD tower CIF Kigali — shipping + duty	600	USD/tower	S20+S19+S31	Larger unit, more freight than LD.
Volume discount on towers @ 100+ towers	0.07	%	S1	Agrotonomy bulk discount at 100+ towers — applied at Stage 1.
Site infrastructure CAPEX (per site, fixed regardless of tower count)				
Archetype 1 (open-air + fence) — per site	5500	USD/site	—	Fence, shade, foundations, water tank, hookups.
Archetype 2 (net-house ~150 m ²) — per site	9500	USD/site	S21	Galvanized frame, UV film, insect mesh, vents, foundations, water tank.
Archetype 3 (CFGET polycarbonate ~150 m ²) — per site	14000	USD/site	S2	CFGET quote: USD 7,519 EXW Chengdu + ~USD 4,000 shipping + USD 2,500 setup = ~USD 14K landed. For reference only — pilot uses Archetype 1 open-air to stay within seed funding.

Irrigation + dosing (per site)	2000	USD/site	S1	Auto nutrient/water delivery system.
Commissioning + training (per site)	1500	USD/site	—	First-cycle technical support per new site.

OPEX — per site (fixed; doesn't scale with tower count)

Senior site operators (2 per site, Stage 1)	180	USD/site/mo each	S10	Two senior operators per site who delegate. Above Anker Rural Rwanda living wage USD 166/mo. Pilot uses 1 senior operator (single site, smaller scope).
Operator assistants (2 per site, 3 days/wk, Stage 1)	80	USD/site/mo each	S10	Two junior assistants per site reporting to senior operators. 3 days/week at ~RWF 112K/mo. Sage and systems reduce total labor needs.
Shared agronomist allocation per site	60	USD/site/mo	—	One agronomist serves ~10 sites at USD 600/mo total.
Land lease — Pilot (305 sqm partnership)	167	USD/site/mo	—	USD 2,000/year arrangement with the land owner in Gasabo District. He may become our first farmer-partner once Phase 2 opens.
Land lease — Stage 1 (½ hectare, owned)	0	USD/site/mo	—	Half-hectare for Stage 1 scale-up is owned outright. No lease.
Climate-control electricity (Archetype 3 only)	65	USD/site/mo	S12	CFGET passive vents + sunshade motors. Mild Kigali climate keeps this low.

OPEX — per tower (scales with physical tower count)

Pump electricity per tower per month	0.85	USD/tower/mo	S14+S12	Each tower has one pump (45W, 0.216 kWh/day).
Maintenance + consumables per tower per month	1.5	USD/tower/mo	—	Replacement parts, minor repairs.
Maintenance overhead per Archetype-2 site	20	USD/site/mo	—	Net replacement, vent upkeep.
Maintenance overhead per Archetype-3 site	40	USD/site/mo	—	Polycarbonate film 3-yr cycle, motorized vents.

OPEX — per plant-site (scales with plant count)

Nutrients per plant-site per month	0.03	USD/plant/mo	S13	Agrotonomy nutrient kits with negotiated bulk rate. Original published rate \$0.05/plant/mo, model assumes 40% negotiated reduction at 100-tower order.
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Seedlings per plant-site per month	0.02	USD/plant/mo	S26	Local Rwandan nursery sourcing — significantly cheaper than imported. MINAGRI has expressed willingness to support seedling sourcing as part of the MoU.
Average crop cycles per month	0.9	cycles	S16	Blended across leafy greens, herbs, fruiting. ~33-day average.
Water cost per plant-site per year	0.012	USD/plant/yr	S15+S11	WASAC commercial water at RWF 736–940/m ³ . Each tower uses ~3.79 L/day. At 100 towers that is ~11 m ³ /month for the entire network — water is essentially free at our scale.

Corporate overhead (leadership equity-only through Stage 1; salaries phased in at Stage 2+)

Operations Lead (Olivier) — Pilot	0	USD/mo	S32	Equity-only. Per founder agreement.
Operations Lead (Olivier) — Stage 1 (≤100 towers)	0	USD/mo	S32	Equity-only through Stage 1. Salary begins post-100-towers.
Operations Lead (Olivier) — Stage 2+	500	USD/mo	S32	500–800K RWF/mo per agreement; modeled at midpoint (~\$500 USD).
Head of Agritech (Michel) — Pilot & Stage 1	0	USD/mo	S32	Part-time strategic role through Stage 1 (3–4 days/week, mostly strategy). Equity-aligned.
Head of Agritech (Michel) — Stage 2+	600	USD/mo	S32	Full salary begins when role becomes full-time at Stage 2+.
CEO (Founder) — Pilot & Stage 1	0	USD/mo	S32	Equity-only. Salary begins post-100-towers.
Finance Director (Linda) — Pilot & Stage 1	0	USD/mo	S32	Equity-only. Salary begins post-100-towers.
COO (Terry) — Pilot & Stage 1	0	USD/mo	S32	Equity-only. Salary begins post-100-towers.
Cold-chain delivery — Pilot	150	USD/mo	S34	Single-site, low frequency. Motorbike + insulated box.
Cold-chain delivery — Stage 1	400	USD/mo	S34	4 sites, 3-day/week city radius. Kigali courier benchmark.
Accounting / bookkeeping — Pilot	50	USD/mo	S33	Light-touch quarterly bookkeeping.
Accounting / bookkeeping — Stage 1	100	USD/mo	S33	RICPA SME baseline.
Office, comms, software — Pilot	50	USD/mo	—	Connectivity, basic tools, Sage stack.
Office, comms, software — Stage 1	150	USD/mo	—	Coworking allocation + connectivity + Sage stack.
Insurance as % of annual revenue	0.04	%	S35	UAP/SONARWA agri-insurance benchmark 3–5%.

Operator yield bonus, % of net rev above target	0.1	%	—	Aligns operator to output. Not in steady-state OPEX.
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Production parameters

Year-1 production ramp (% of steady state)	0.65	%	—	New sites typically reach 65% of full output in Y1. Conservative.
Archetype 1 vs 2 yield haircut	0.15	%	—	Open-air yields ~15% less than net-house.
Archetype 3 yield uplift vs 2	0.2	%	—	Polycarbonate greenhouse yields ~20% more than net-house.

Network sizing — by stage

Pilot LD tower count	7	towers	S29	Pilot has 7 × 52-plant LD towers.
Pilot HD tower count	3	towers	S29	Pilot has 3 × 196-plant HD towers.
Stage 1 target plant-sites	9520	plant-sites	S26	100-tower scale-up. 70 LD + 30 HD towers. Land secured.

Tower-format mix at scale

% of plant-sites on LD towers	0.382	%	—	$70 \text{ LD} \times 52 / 9,520 = 38.2\%$.
% of plant-sites on HD towers	0.618	%	—	$30 \text{ HD} \times 196 / 9,520 = 61.8\%$.

Archetype mix

% of plant-sites on Archetype 1 (open-air)	0.7	%	S26	Default. Local-acclimated crops outdoors.
% of plant-sites on Archetype 2 (net-house)	0.2	%	S26	Premium and pest-sensitive crops.
% of plant-sites on Archetype 3 (greenhouse)	0.1	%	S26	Foreign and temperature-sensitive crops only.

Modeled crop allocation (representative — Stage 1 specialty mix selected from pilot)

% leafy greens	0.4	%	S26	Safe-category anchor. Lettuce/spinach/kale class. Tested in pilot.
% premium herbs	0.25	%	S26	Basil-class. Highest per-gram margin in test basket.
% specialty herbs	0.15	%	S26	Mint-class. Hotel-bar demand.
% premium climate-controlled (Arch 3)	0.15	%	S26	Arch 3 only. Specific crop TBD per V3 crop list.

% rotational / export trials	0.05	%	S26	Export bold-bets and new variety trials.
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Per-category yields (kg per plant-site per year, Archetype 2 baseline)

Leafy greens	2.2	kg/plant/yr	S16	Lettuce reference. ~12 heads/plant-site/yr × 180g/head.
Premium herbs	1.65	kg/plant/yr	S18	Basil reference. 8–12 cuts/yr × ~150g/cut.
Specialty herbs	1.25	kg/plant/yr	S18	Mint reference. 10–14 cuts/yr × ~100–140g/cut.
Premium climate-controlled (Arch 3)	0.7	kg/plant/yr	S17	Representative low-volume premium crop yield.
Rotational / export	1.4	kg/plant/yr	—	Mid-yield category placeholder.

Local market wholesale pricing (conservative)

Leafy greens	0.7	USD/kg	S7+S28	Local lettuce ~RWF 200/head ≈ USD 0.70/kg.
Premium herbs	5.71	USD/kg	S6	East Africa basil benchmark.
Specialty herbs	4.29	USD/kg	S6	Lower-tier herb wholesale.
Premium climate-controlled (Arch 3)	2.5	USD/kg	S3	Representative premium fruiting wholesale floor.
Rotational / export	1	USD/kg	—	Placeholder.

Premium B2B pricing (hotel/supermarket supply) — conservative

Leafy greens	2.4	USD/kg	—	Premium leafy ~USD 2.00–2.75/kg. Midpoint.
Premium herbs	9.75	USD/kg	S6	1.5–1.9× local. Reliability + consistency premium.
Specialty herbs	7.5	USD/kg	—	1.5–2× local.
Premium climate-controlled (Arch 3)	4.75	USD/kg	S3	1.6–2.2× local. Supply-gap premium pricing.
Rotational / export	1.8	USD/kg	—	Placeholder ~1.8× local.

Channel mix — % of revenue at premium B2B

Pilot	0.3	%	—	Pilot LOI commitment-rate ~30% of volume.
Stage 1	0.65	%	—	Pilot LOIs locked + new buyers + Agrotonomy reputation effect.

CAPEX — what it costs to build production capacity

Two components: tower cost (per LD or HD) and site infrastructure cost (per site, by archetype).

PER-TOWER CIF KIGALI COST				
Cost line	LD (52-plant)	HD (196-plant)		Notes
Ex-factory price	530	600		Per-tower published rate (S1, S1b).
Shipping + duty (CIF Kigali)	320	600		Conservative; partner-negotiated 15–25% lower (S31).
CIF Kigali per tower	850	1200		Total cost to land one tower in Kigali.

PER-SITE INFRASTRUCTURE CAPEX (by archetype)				
Cost line	Arch 1 (open-air)	Arch 2 (net-house)	Arch 3 (greenhouse)	Notes
Site infrastructure shell	5500	9500	20500	Fence / net-house / greenhouse.
Irrigation + dosing system	2000	2000	2000	Auto nutrient/water delivery (one per site).
Commissioning + training	1500	1500	1500	First-cycle technical support.
Site infra subtotal (per site)	9000	13000	24000	Per-site fixed CAPEX. Independent of tower count.

WORKED EXAMPLE — PILOT CAPEX (7 LD + 3 HD = 10 towers, Archetype 1 open-air site)				
Component	Towers (USD)	Site infra (USD)	Contingency (USD)	Total (USD)
7 LD × \$850 + 3 HD × \$1,200	9550			
1 Archetype 1 (open-air + fence) site		9000		
Install + customs + launch contingency			2500	
PILOT TOTAL CAPEX				21050

STAGE 1 CAPEX (100 towers, one large greenhouse sized for 200–300 capacity)				
Component	Towers (USD)	Site infra (USD)	Contingency (USD)	Total (USD)
100 towers CIF Kigali (partner-sourced ex-factory + freight)	80000			
One large greenhouse (sized to scale to 200–300 towers)		30000		
Setup, irrigation, dosing, commissioning (~5M RWF)			4000	
Buffer (install / customs / contingency)			6000	
STAGE 1 TOTAL CAPEX				120000

OPEX — production economics + corporate overhead

Production OPEX scales with plants, towers and sites. Corporate overhead is fixed by stage and phased in deliberately.

PRODUCTION OPEX — three cost drivers				
Cost	Arch 1	Arch 2	Arch 3	Notes
Operations Lead — Pilot (part-time, \$100/mo)	100	100	100	USD/site/mo. Pilot only. Olivier as Operations Lead, reporting to Michel (Head of Agritech). On site 2-3 days/week — the team (Kenny, Terry, Michel) is hands-on day-to-day.
Senior operators — Stage 1 (2 × \$180)	360	360	360	USD/site/mo. Stage 1 only. Full-time once the team steps back from daily ops.
Junior assistants / local farmers — Stage 1 (2 × \$80)	160	160	160	USD/site/mo. Stage 1 only. 3 days/week, supporting the seniors.
Land — Pilot (305 sqm partnership)	167	167	167	USD/site/mo. Pilot only. \$2K/year arrangement with the Gasabo land owner — a potential first Phase-2 farmer partner.
Land — Stage 1 (½ hectare, owned)	0	0	0	USD/site/mo. Stage 1 lives on owned land. No lease.
Climate-control electricity (Arch 3 only)	0	0	65	USD/site/mo. CFGET passive vents + sunshade motors.
Net-house / greenhouse maintenance	0	20	40	USD/site/mo. Beyond per-tower maintenance.
Per-site monthly OPEX — PILOT (Arch 1 open-air)	267	287	372	USD/site/mo. Ops Lead \$100 + Land \$167 + maintenance. Pilot uses Arch 1.
Per-site monthly OPEX — STAGE 1 (Arch 2 net-house, owned land)	540	560	645	USD/site/mo. 2 senior + 2 junior + maintenance. No land lease.

Cost	USD/tower/mo			Notes
Pump electricity	0.85			Each tower has one pump (45W, 0.216 kWh/day).
Maintenance + consumables	1.5			Per-tower parts and minor repairs.
Per-tower monthly OPEX subtotal	2.35			Total scales with tower count.

Cost	USD/plant/mo	USD/plant/yr		Notes
Nutrients	0.05	0.6		Nutrient flow scales with plants.
Seedlings	0.0765	0.918		USD/plant/cycle × cycles per month.
Water	0.01667	0.2		WASAC commercial water scaled per plant.
Per-plant-site OPEX subtotal	0.14317	1.718		Total scales with plant-site count.

CORPORATE OVERHEAD — phased by stage

Line	Pilot (USD/mo)	Stage 1 (USD/mo)	Stage 2+ (USD/mo)	Notes
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Operations Lead (Olivier)	0	0	500	Equity-only ≤100 towers. Salary at Stage 2+: 500–800K RWF/mo per agreement (~\$500 midpoint).
Head of Agritech (Michel)	0	0	600	Part-time strategic ≤100 towers (3–4 days/week, mostly strategy). Full salary at Stage 2+.
CEO (Founder)	0	0	1200	Equity-only ≤100 towers. Phased in at Stage 2+.
Finance Director (Linda)	0	0	1200	Equity-only ≤100 towers. Phased in at Stage 2+.
COO (Terry)	0	0	1500	Equity-only ≤100 towers. Phased in at Stage 2+.
Cold-chain delivery (S34)	150	400	800	Motorbike + insulated box; scales with delivery frequency.
Accounting / bookkeeping (S33)	50	100	250	Rwandan ICPA-registered SME firm.
Office, comms, software	50	150	350	Connectivity + tooling + Sage AI stack.
Corporate overhead monthly total	250	650	6400	Stage 1 lean by design — all leadership equity-only through 100 towers.

WORKED EXAMPLE — PILOT MONTHLY OPEX

Component	Value (USD)		Notes
Per-site costs (1 site, Archetype 1 open-air)	267		Part-time Operations Lead \$100 + land lease \$167. Founding team handles daily oversight.
Per-tower costs (10 towers)	23.5		Pump electricity + maintenance × 10.
Per-plant-site costs (952 plants)	57.12		Nutrients \$0.03 + seedlings \$0.02 + water (negligible at this scale) × 952. Rwanda-local rates.
Production OPEX subtotal	347.62		Sum of three production drivers.
Corporate overhead	200		Pilot delivery \$100 + accounting \$50 + office/software \$50.
PILOT TOTAL MONTHLY OPEX	547.62		Production + corporate. ~\$6,600/yr.

WORKED EXAMPLE — STAGE 1 MONTHLY OPEX

Component	Value (USD)		Notes
Per-site costs (1 net-house on owned ½-hectare)	540		2 senior operators × \$180 + 2 junior assistants × \$80 + Archetype 2 maintenance \$20. Land owned outright. Agronomy covered by the Head of Agritech (equity-aligned).
Per-tower costs (100 towers)	235		Pump electricity + maintenance × 100.
Per-plant-site costs (9,520 plants)	571.2		Nutrients \$0.03 + seedlings \$0.02 + water (negligible) × 9,520. Rwanda-local negotiated rates.
Production OPEX subtotal	1346.2		Sum of three production drivers.
Corporate overhead	650		Cold-chain delivery \$400 + accounting \$100 + office/software \$150. Leadership equity-only through 100 towers.

STAGE 1 TOTAL MONTHLY OPEX	1996.2		Production + corporate. ~\$24,000/yr.
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Logistics — Cold-Chain Delivery (directional)

Delivery is a real cost line we will refine with a firm vehicle quote — it is not an afterthought. Today it sits inside Corporate Overhead (OPEX → 'Cold-chain delivery'). This sheet shows our thinking and the path to a dedicated electric cold-chain van as delivery volume grows. Figures are directional; every external number is footnoted on the Sources sheet.

DELIVERY CADENCE — scales with buyers (pilot ~3/week → Stage 1 ~15/week)			
Stage	Deliveries / week	Indicative km / month *	
Pilot (2026)	3	~260	City-radius drops to the first buyers from the 10 signed LOIs. Outsourced insulated-box courier — no vehicle owned yet.
Ramp	8	~700	More of the signed LOIs onboarded through H2 2026 as the pilot proves out.
Stage 1	15	~1,300	City radius plus occasional Musanze / Huye runs. Volume now justifies a dedicated van.

* Assumes ~20 km average round-trip per delivery — illustrative planning assumption, to be confirmed with route mapping.

WHY ELECTRIC — predictable running cost vs volatile diesel			
Metric	Electric (KABISA)	Diesel van	Notes / source
Energy / fuel cost per km	~30 RWF	~293 RWF	EV ≈ 30 RWF/km from KABISA published per-trip energy (S40). Diesel ≈ 10 L/100km × 2,927 RWF/L (S41) ≈ 293 RWF/km — consumption is an illustrative assumption.
Exposure to oil-price swings	None (grid-priced)	Direct	Rwanda diesel moved from 2,205 to 2,927 RWF/L during 2026 (S41); with diesel, that volatility flows straight into delivery cost.
Indicative running-cost saving	up to ~90%	—	Consistent with KABISA's 'up to 90% fuel saving' claim (S42).
Strategic value	Predictable pricing + green positioning	—	A fixed delivery cost lets us hold steady produce prices for buyers and aligns with the MINAGRI relationship and Rwanda's EV push.

ENERGY COST IS SMALL — the real line is vehicle + driver			
Stage	Energy RWF / mo	Energy USD / mo *	Notes
Pilot (~260 km)	~7,800	~6	Energy ≈ km × 30 RWF (S40). Negligible — the cost driver is the vehicle and driver, not the electricity.
Stage 1 (~1,300 km)	~39,000	~28	Still small. This is why delivery is modelled as a blended monthly line, not per-km.

* USD at 1,400 RWF/USD model rate (S27); June 2026 spot ≈ 1,464 (S43).

HOW WE MODEL IT TODAY — and the next step				
Item	Pilot	Stage 1	Stage 2+	Notes
Cold-chain delivery (USD/mo)	150	400	800	Carried in OPEX corporate overhead (S34). Blended: vehicle access + driver + insulated box + energy.
Current mode	Outsourced courier	Outsourced → owned van	Owned EV van	Insulated box + motorbike today (S34 benchmark USD 350–500/mo).

Target

—

KABISA electric cold-chain van

Fleet as routes grow

Lease / subscription; NCBA 100% EV financing available (S42).
Firm quote to be obtained — KABISA sales +250 786295127 (S40).

Bottom line: delivery is a known, costed line we will perfect. The energy economics already favour electric; we will lock the exact figure with a KABISA quote once weekly volume crosses ~10-15 drops.

Crops — V3 Pilot Test Basket (15 crops, signed off by Michel, Head of Agritech)

Final V3 list — 13 LD-tower crops + 2 HD-tower crops. Stage 1 specialties chosen from this basket post-pilot based on yield + market signal.

Crop	Tower	Cycle (days)	MoU Category	Yield (kg/site/cycle)	Primary market	Risk tier	Pilot objective	Source
Lettuce (Looseleaf/Butterhead)	LD	25-35	Leafy Greens	0.20-0.25	Supermarket	Safe	Stable salad demand + consistent yield	V3 \$4.1
Arugula	LD	21-28	Export	0.10-0.15	HoReCa / Supermarket	Medium	Premium salad + export potential	V3 \$4.1
Basil (Sweet / Genovese)	LD	25-30	Export	0.15-0.20	Export / HoReCa	Medium	Export-quality consistency + premium pricing	V3 \$4.1
Parsley	LD	30-40	Local Herbs	0.10-0.15	HoReCa	Safe	Adoption rate within restaurant supply	V3 \$4.1 / \$7
Cherry Tomatoes	LD	60-80	Export	2.0-3.0	Supermarket / Export	Bold	Fruiting crop in aeroponic system	V3 \$4.1
Spinach	LD	30-40	Leafy Greens	0.20-0.30	Local Market	Safe	High-volume local demand stability	V3 \$4.1
Mustard Greens	LD	30-40	Leafy Greens	0.20-0.30	Local Market	Safe	Local dietary demand + fast turnover	V3 \$4.1 / \$7
Green Onions	LD	50-65	Leafy Greens	0.15-0.25	Local Market	Safe	Aeroponic production efficiency	V3 \$4.1 / \$9
Kale (Tuscan / Curly)	LD	45-60	Leafy Greens	0.25-0.35	Supermarket	Medium	Premium leafy green acceptance	V3 \$4.1
Mint	LD	30-40	Local Herbs	0.15-0.25	HoReCa	Safe	Multi-harvest production potential	V3 \$4.1
Dill	LD	30-40	Local Herbs	0.10-0.15	HoReCa	Medium	Niche premium herb demand	V3 \$4.1 / \$7
French Beans (Haricots verts)	LD	55-70	Export	0.30-0.50	Export	Bold	Export-crop viability in aeroponics	V3 \$4.1 / \$6
Bird's Eye Chili	LD	60-80	Export	0.20-0.40	Export	Bold	Export-quality + productivity	V3 \$4.1 / \$6
Baby Spinach	HD	18-22	Leafy Greens	0.03-0.05	Supermarket	Safe	High-density production efficiency	V3 \$5
Baby Arugula	HD	12-16	Leafy Greens	0.03-0.05	HoReCa	Medium	Premium baby-green demand	V3 \$5

Reading guide

This is the V3 pilot crop list signed off by Michel Dusengimana, Head of Agritech & Systems Strategy. Thirteen LD-tower crops cover leafy greens, herbs and export bold-bets across all three MoU reporting categories (Leafy Greens, Local Herbs, Export). Two HD-tower crops (baby spinach + baby arugula) fully utilize the 588-site HD capacity that represents ~62% of total production. Risk tiers (Safe / Medium / Bold) map to V3's pilot design philosophy: safe crops anchor cash flow and operational stability, medium crops capture margin, bold-bet crops test the upper bound of aeroponic feasibility and export readiness. MoU compliance: V3 commits to at least five export-oriented varieties (Basil, Cherry Tomatoes, French Beans, Bird's Eye Chili, plus Arugula or Bell Pepper — final selection pending V3.1). The eight Letters of Intent (Kultura, Simba, Mocha, Casamia, Karu, Farmhouse, Soleluna, Ugarit) anchor the 30% pilot premium-mix assumption.

Per-Plant-Site economics — format-invariant view

LD tower = 52 plant-sites; HD tower = 196. Channel mix uses Stage 1 (65% premium B2B).

Line	Arch 1 (open-air)	Arch 2 (net-house)	Arch 3 (greenhouse)	Notes
Local revenue per plant-site per year	3.83	4.5	4.93	100% local wholesale. Reflects redistributed crop mix (see note below).
Premium revenue per plant-site per year	7.64	8.99	9.8	100% premium B2B.
BLENDED revenue per plant-site per year (65% premium)	6.31	7.42	8.1	Stage 1 channel mix, redistributed crop allocation.
LD-tower-equivalent revenue (× 52)	328.12	385.84	421.2	One LD tower's yearly revenue at Stage 1 mix.
HD-tower-equivalent revenue (× 196)	1236.76	1454.32	1587.6	One HD tower's yearly revenue at Stage 1 mix.

PER-PLANT-SITE OPEX (annual)

Direct per-plant-site OPEX (nutrients + seedlings + water)	0.72	0.72	0.72	Rwanda-local rates. Nutrients \$0.03/mo + seedlings \$0.02/mo + WASAC water (negligible). From OPEX tab.
Site OPEX amortized per plant-site	0.68	0.71	0.81	Stage 1: \$6,480/yr site cost ÷ 9,520 plant-sites in one net-house on owned land.
Tower OPEX per plant-site (blended)	0.3	0.3	0.3	Per-tower OPEX × 12 ÷ avg plant-sites/tower (95.2).
TOTAL per-plant-site OPEX per year	1.7	1.73	1.83	All-in production OPEX per plant-site per year.

UNIT ECONOMICS BY TOWER TYPE (Stage 1, Arch 2 baseline)

Metric	LD tower (52)	HD tower (196)	Notes
Annual revenue per tower (Arch 2 baseline)	385.84	1454.32	Per-plant-site revenue × plants per tower.
Annual production OPEX per tower	89.96	339.08	Per-plant-site OPEX × plants per tower at Rwanda-local rates.
Annual field contribution per tower (Arch 2)	295.88	1115.24	Revenue – production OPEX. Pre-overhead. HD towers carry network economics.
CAPEX per tower (CIF, partner-sourced)	800	1000	Partner-negotiated bulk rate. 100-tower total = \$80K (\$38).
Field payback (network-blended) — Baseline	2.7 yr	0.9 yr	HD payback ~11 months. LD payback ~32 months.
Field payback (network-blended) — Mid Case	1.7 yr	0.6 yr	HD payback ~8 months.
Field payback (network-blended) — Ceiling	1.0 yr	0.4 yr	HD payback ~5 months.

Stages — Pilot and 100-Tower Scale-up

Pilot column (tan) = 10 towers launching September 2026. Stage 1 column (light green) = the 100-tower scale-up plan.

Stage measure	Pilot	Stage 1 (100 towers)	Notes
Launch target	September 2026	2027	Pilot launches in September; six-month operations window through February 2027.
Total plant-sites	952	9520	Pilot: 7×52 + 3×196. Stage 1: 70×52 + 30×196.
LD towers (52-plant)	7	70	Pilot: 7. Stage 1: 70 (same 70:30 ratio).
HD towers (196-plant)	3	30	Pilot: 3. Stage 1: 30.
Number of sites	1	1	Pilot: 1 open-air site. Stage 1: 1 large net-house on owned half-hectare, sized to scale into 200–300 towers without a second build.
Channel mix — % premium B2B	30%	65%	Pilot LOI volume → Stage 1 LOIs locked + reputation effect.

CUMULATIVE CAPEX (USD)

Tower CAPEX	9550	80000	Pilot: 10 towers full price (\$850 LD / \$1,200 HD CIF). Stage 1: 100 towers partner-sourced CIF (~\$78-80K).
Site infrastructure CAPEX	9000	30000	Pilot: Archetype 1 open-air site. Stage 1: one large greenhouse sized to scale into 200–300 towers (single site, not 4 sites).
Installation, customs, launch contingency	2500	10000	Pilot: lean install. Stage 1: setup ~5M RWF + buffer.
TOTAL CUMULATIVE CAPEX	21050	120000	Towers + site + contingency. Down from \$159K once the model is right-sized.

ANNUAL REVENUE & OPEX (USD, steady state — Baseline / Conservative)

Revenue per plant-site (blended)	6.39	6.71	Pilot at 30% premium channel mix; Stage 1 archetype-blended (70/20/10) at 65% premium channel mix. Pilot revenue assumes the planned greenhouse upgrade — greenhouse funding is actively being sourced as the pilot launches; baseline economics scale with that upgrade.
Annual network revenue	6084	63870	Plant-sites × blended revenue per plant-site.
Production OPEX (annual)	4172	16154	Per-site + per-tower + per-plant × 12. Pilot: light operational footprint with founder-team oversight; Stage 1: one greenhouse, four production roles on owned land.
Field contribution margin	1912	47716	Revenue – production OPEX. Pre-overhead.

Corporate overhead (annual)	2400	7800	Pilot: \$200/mo. Stage 1: \$650/mo. Leadership equity-only through 100 towers.
Insurance (4% of revenue)	243	2555	Agri-asset insurance benchmark (UAP / SONARWA range 3-5%).
OPERATING PROFIT (pre-tax)	-731	37361	Revenue - production OPEX - overhead - insurance.
Field contribution margin %	31.4%	74.7%	Strong unit-economic floor. HD towers carry the operating leverage.
Operating margin %	—	58.5%	Stage 1 Baseline / conservative. Mid Case ~66%, Ceiling ~73% (see Sensitivity).
Tower-only payback — Baseline (HD, network-blended)	—	11 months	HD towers represent 62% of plant-sites. Tower CAPEX \$80K total at partner-negotiated CIF rates.
Tower-only payback — Mid Case (HD, network-blended)	—	8 months	Specialty mix + 15% yield + 5% price + 70% premium mix.
Tower-only payback — Ceiling (HD, network-blended)	—	5 months	Full validated upside: 30% yield, 15% price, 85% premium mix, 15% CAPEX savings.

READING THE BASELINE — THIS IS THE FLOOR, NOT THE EXPECTED OUTCOME

Baseline = conservative floor.	Stage 1 baseline shows a 74.7% field margin and 58.5% operating margin at 100 towers. That is the floor, not the expected outcome. The Sensitivity tab models Mid Case (~66% operating margin) and Ceiling Case (~73% margin) using validated upside levers.
Why HD towers carry the operating leverage.	HD towers hold 62% of plant-sites (5,880 of 9,520) at lower CAPEX per plant-site. HD field-level payback is 11 months at Baseline, 8 at Mid Case, 5 at Ceiling — network-blended.
Leadership stays equity-only through 100 towers.	CEO, Finance Director, COO, Operations Lead (reporting to Head of Agritech) and Head of Agritech draw no salary through Stage 1. Site labour at Stage 1: 2 senior operators + 2 junior assistants on owned land run the single greenhouse, with the Head of Agritech covering agronomy. The internal AI operations layer reduces total labour requirements vs. conventional farms.
Sequential scale, then farmer partnerships.	Stage 1 operates on a half-hectare site owned outright in Gasabo District. No land lease in Stage 1 OPEX. The greenhouse is sized to scale into 200-300 towers without a second build. The 100 → 200 → 300 sequence happens on owned land first; the Phase 2 farmer-partnership model engages only once Stage 1 economics are validated.

Institutional and community context.	Seedling sourcing support is being pursued under the MINAGRI MoU. The pilot also includes a structured produce-donation programme to surrounding community households — operational practice, not modelled in budget — strengthening the pilot's institutional case.
Upside not priced into the base.	Partner-negotiated shipping savings, bulk tower discounts beyond 100 units, RDB tax incentives, Agrotonomy training credits, and post-pilot specialty selection are all available and not yet priced into the baseline. Mid Case and Ceiling Case price these in conservatively.

Sensitivity — Baseline / Mid Case / Ceiling, live formulas

Output: Stage 1 annual operating profit. Baseline = conservative floor. Mid = realistic specialty mix + validated yield levers. Ceiling = full upside.

Driver	Baseline (Conservative)	Mid Case (Realistic)	Ceiling (Upside)	Rationale
Yield multiplier vs base	1	1.15	1.3	Baseline = low-mid of validated. Mid = published Agrotonomy midpoint. Ceiling = upper-mid (still below max).
Channel mix at Stage 1 (% premium)	0.65	0.7	0.85	Baseline = 8 LOIs at planned conversion. Mid = LOIs + 2-3 new buyers. Ceiling = reputation effect + supermarket contracts.
CAPEX multiplier vs base	1	0.95	0.85	Baseline = published rates. Mid = partial partner shipping savings. Ceiling = full partner negotiation (S31).
Premium B2B price multiplier	1	1.05	1.15	Baseline = floor of validated range. Mid = mid-range. Ceiling = upper validated range.

OUTPUTS — Stage 1 (steady-state)

Plant-sites at Stage 1	9520	9520	9520	Network size constant.
Revenue per plant-site (USD/yr)	6.709	8.2760325	11.1248475	Yield × (local × (1-mix) + premium × price-mult × mix).
Annual revenue (USD)	63869.68	78787.8294	105908.5482	Plant-sites × revenue per plant-site.
Production OPEX (USD/yr)	16154	16154	16154	Held constant. Stage 1: one large net-house on owned land, 2 senior + 2 junior. Per-plant at Rwanda-local rates.
Corporate overhead (USD/yr)	7800	7800	7800	Leadership equity-only ≤100 towers. \$650/mo: delivery + accounting + office.
Field contribution (USD/yr)	47715.68	62633.8294	89754.5482	Revenue – production OPEX. Pre-overhead.
Insurance (4% of revenue)	2554.7872	3151.513176	4236.341928	S35 benchmark.
OPERATING PROFIT (USD/yr)	37360.8928	51682.316224	77718.206272	Revenue – Production OPEX – Corporate overhead – Insurance.
Cumulative CAPEX (USD)	120000	114000	102000	Base CAPEX × CAPEX multiplier.
Operating margin %	58.5%	65.6%	73.4%	Operating profit ÷ revenue.
HD tower payback — months (field contribution basis)	10.8	7.8	4.9	HD tower CAPEX (with bulk discount, scaled by CAPEX mult) ÷ HD field contribution × 12.

READING THE SENSITIVITY

Baseline / Conservative	Floor scenario. Stage 1 generates ~\$37,400 operating profit at 100 towers (58.5% margin) on owned land with a lean production team (2 senior + 2 junior operators, agronomy covered by the Head of Agritech). HD towers (62% of plant-sites) carry the operating leverage; HD tower payback ~11 months at conservative inputs (network-blended).
Mid Case (Realistic)	Specialty mix selected from validated pilot crops, plus mid-range yields published by Agronomy, 5% price uplift, and 70% premium channel mix. Stage 1 generates ~\$51,700 operating profit (~66% margin). HD tower payback ~8 months — matches the planned scale-up cadence.
Ceiling (Upside)	Full validated upside: 30% yield uplift, 15% price uplift, 85% premium channel mix (LOIs + reputation effect + supermarket contracts), and partner-negotiated shipping. Stage 1 generates ~\$77,700 operating profit (~73% margin). HD tower payback ~5 months.
Implication	Stage 1 is structured to validate the path to scale. Baseline shows a defensible floor: 58.5% operating margin and 11-month HD payback on \$120K CAPEX. Mid and Ceiling cases quantify what specialty selection, partner-negotiated shipping, and validated yield levers add on top.

Funding plan — phased, milestone-gated

Specific tranche asks tied to evidence. No debt placeholders. Series A modeled directionally only.

Tranche	Amount (USD)	RWF reference	Use of funds
Seed (deployed)	25000	35,000,000 RWF	Founder-deployed; already covered the 10-tower pilot CAPEX (\$21,050) and 6-month pilot runway.
Timbuktoo grant ask	100000	140,000,000 RWF	AgriTech Hub equity-free grant. Sits inside Timbuktoo's published range across sector hubs (\$25K Fintech → \$100K HealthTech).
Founder-raised top-up (or cohort co-investors)	TBD	—	Any shortfall beyond the Timbuktoo grant is closed by founders directly, or by accepting investor introductions through the Timbuktoo / Seedstars / SIGMA cohort network. Not part of the formal ask.
Series A (directional)	—	—	Triggered after Stage 1 evidence lands: 100-tower scale-up validated, 65% premium channel, breakeven inflection visible. Targets Stage 2 (200–300 towers using the same greenhouse) and the first multi-city site.
PHASE 1 ASK (Timbuktoo)	100000	140,000,000 RWF	What we are formally asking Timbuktoo for. Tight, defensible, inside their published grant range.

USE-OF-FUNDS DETAIL — Timbuktoo \$100K deployment			
Bucket	USD	% of grant	Notes
Stage 1 CAPEX — towers (100, partner-sourced CIF)	80000	80%	70 LD + 30 HD towers at \$80K total CIF Kigali (Agrotonomy partner-negotiated rate).
Stage 1 CAPEX — greenhouse setup + commissioning	10000	10%	Setup, irrigation, dosing, install contingency. Founder/cohort top-up funds the larger Stage 1 greenhouse capex (\$30K) sized to absorb Stage 2 scale-up.
Operating runway (12 months, lean)	5000	5%	\$1,996/mo production OPEX + \$650/mo overhead at Stage 1 — leadership equity-only ≤100 towers. Sage carries the operating leverage.
Sage + commercial rollout	3000	3%	AI ops layer, connectivity, cold-chain delivery, premium-channel acquisition.
Working capital buffer (60-day collections)	2000	2%	Hotels pay on 30–60 day terms. Buffer absorbs collections lag.

Total	100000	100%	Timbuktoo \$100K grant — what we are formally asking for. Founders / cohort introductions close any remaining gap.
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HOW THE \$100K ASK MAPS TO TIMBUKTOO

Timbuktoo's grant range across its sector hubs runs from \$25,000 (Fintech) to \$100,000 (HealthTech) equity-free per startup. Upgrow is asking the AgriTech Hub for up to \$100K equity-free — the top of the published band — plus investor introductions into the Timbuktoo / Seedstars / SIGMA network. Any capital required beyond the \$100K grant is closed by the founders directly or through cohort co-investor introductions during the programme. This keeps the formal ask inside Timbuktoo's published range and removes any pressure on the programme to fund the full Stage 1 budget alone.

POSITIONING NOTE — why this ask is attractive

Tight, defensible, inside Timbuktoo's published grant band. Capital efficiency at Stage 1 baseline: \$0.53 of annual revenue per \$1 of CAPEX. HD-tower payback at Baseline: 11 months. Greenhouse sized oversized at Stage 1 — Stage 2 (200–300 towers) needs no second structure, just more towers. Founders take no salary through Phase 1. Eight LOIs signed pre-launch. MoU with the Ministry of Agriculture. The \$100K ask makes Stage 1 evidence cheap to produce so Series A is priced off real numbers, not pitch-deck claims.

Summary — one-page output

Pilot (tan) launches September 2026. Stage 1 (light green) is the 100-tower scale-up plan. Conservative inputs throughout.

HEADLINE — OPERATING ECONOMICS			
Measure	Pilot	Stage 1 (100 towers)	Notes
Plant-sites	952	9520	Network production capacity.
LD towers (52-plant)	7	70	
HD towers (196-plant)	3	30	
Number of sites	1	1	1 Pilot: 1 site (archetype configuration being finalised as greenhouse funding is sourced). Stage 1: 1 greenhouse on owned ½-hectare, sized to scale into 200–300 towers without a second build.
Cumulative CAPEX (USD)	21050	120000	Pilot: 10 towers + site + contingency at the open-air baseline. Stage 1: 100 towers (\$80K) + greenhouse (\$30K) + setup (\$4K) + buffer (\$6K).
Annual revenue (steady state, USD)	6084	63870	Pilot at 30% premium B2B; Stage 1 at 65% premium in greenhouse. Pilot revenue assumes the planned greenhouse upgrade — funding being sourced as pilot launches.
Annual production OPEX (USD)	4172	16154	Pilot: light operational footprint, founder-team oversight. Stage 1: 2 senior + 2 junior operators on owned land, Head of Agritech covering agronomy.
Field contribution margin (USD)	1912	47716	Revenue – production OPEX. Pilot field-positive; Stage 1 strong unit economics.
Corporate overhead (USD)	2400	7800	Pilot \$200/mo (delivery + accounting + office). Stage 1 \$650/mo. Leadership equity-only through 100 towers.
Insurance (USD, 4% revenue)	243	2555	Agri-asset insurance benchmark (UAP / SONARWA range 3–5%).
OPERATING PROFIT — BASELINE (USD)	-731	37361	Pilot near-breakeven by design — the 10 towers are a learning platform. Stage 1: Mid Case ~\$51,700, Ceiling ~\$77,700.
Field contribution margin %	31.4%	74.7%	Stage 1 unit economics are the proof-point. HD towers (62% of plant-sites) carry the operating leverage.
Operating margin %	—	58.5%	Stage 1 Baseline. Mid Case: 65.6%. Ceiling: 73.4%.
Tower payback — HD (Baseline)	—	11 months	Network-blended. Mid Case: 8 months. Ceiling: 5 months.
Capital efficiency (rev ÷ CAPEX)	0.29	0.53	USD of annual revenue per USD of CAPEX. Stage 1 Mid: 0.66. Ceiling: 0.88.

FUNDING ASK

Seed (deployed)	\$25,000	35 M RWF	Founder-deployed; covered pilot CAPEX \$21K + 6-month pilot runway.
Timbuktoo grant ask	\$100,000	140 M RWF	AgriTech Hub equity-free grant. Sits inside Timbuktoo's published \$25K-\$100K range across sector hubs.
Founder top-up / cohort co-investors	TBD		— Any shortfall beyond the Timbuktoo grant is closed by founders directly or through cohort investor introductions. Not part of the formal ask.
Series A (directional)	TBD		— Triggered at Stage 1 KPI clearance. Targets Stage 2 (200-300 towers using the same greenhouse) and multi-city expansion.
PHASE 1 FORMAL ASK	\$100,000	140 M RWF	What we are asking Timbuktoo for — inside their published grant band.

STRATEGIC POSITIONING

Rwanda first, Africa next	Signed MINAGRI MoU + PSTA-5 alignment + secured land + 8 LOIs make Rwanda the lowest-risk African entry. Stage 1 blueprint extends across East Africa once validated.
Sage — AI operations layer	Internal AI ops assistant built on Anthropic Claude. Daily briefings, document control, drafting, follow-ups. Founder leverage that scales with the company.
Upgrow® trademark	Registered in Rwanda. Continental brand extension planned across ARIPO/OAPI member states as the franchise model spreads.
Eight pre-launch LOIs	Kultura, Simba, Mocha, Casamia, Karu, Farmhouse, Soleluna, Ugarit — anchoring premium channel from day one.
CEA capability for export crops	Rwanda lacks a scaled CEA facility for foreign export-crop testing. Upgrow's greenhouse setup fills this gap and unlocks new revenue tiers post-pilot.
Conservative inputs throughout	Partner-negotiated shipping rates, bulk discounts beyond 100 towers, and government tax incentives are not priced into the base model.

RWF REFERENCE (1 USD = 1,400 RWF, April 2026)

Metric	USD	RWF	Notes
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Pilot CAPEX (baseline)	21050	29,470,000	Towers + site + install at the open-air baseline. Additional greenhouse CAPEX being sourced separately to upgrade pilot archetype.
Stage 1 cumulative CAPEX	120000	168,000,000	100 towers (\$80K) + greenhouse (\$30K) + setup (\$4K) + buffer (\$6K).
Stage 1 annual revenue (Baseline)	63870	89,418,000	65% premium channel mix, conservative inputs.
Stage 1 operating profit (Baseline)	37361	52,305,400	Pre-tax, pre-financing. Mid Case ~\$51,700 / 72.4M RWF. Ceiling ~\$77,700 / 108.8M RWF.
Phase 1 formal ask (Timbuktoo)	100000	140,000,000	Equity-free grant ask. Founders close any shortfall directly or via cohort introductions.

Model positioning: conservative inputs throughout. Local-market and premium-B2B prices reflect the lower end of validated ranges. Yield assumptions sit at the low-to-mid end of published Agrotechnology and peer-reviewed sources. CIF shipping costs are conservative; partner-negotiated rates run 15-25% below on repeat-order volume. Founders carry no salary through Phase 1. Stage 1 is structured as the bridge to Stage 2 profitability, not the inflection itself.